AN EXPLORATION OF CULTURE DEPENDENT MODIFIABLE RISK FACTORS FOR LOW BACK PAIN IN ADDIS ABABA, ETHIOPIA: - DEVELOPING AN INTEGRATED PREVENTATIVE MODEL

By

MENGESTIE MULUGETA BELAY

Submitted in accordance with the requirements for

the degree of

DOCTOR OF LITERATURE AND PHILOSOPHY

in the subject

HEALTH STUDIES

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: PROFESSOR TENNYSON MGUTSHINI

JANUARY 2020

DEDICATION

This thesis is dedicated to the memory of my late beloved father, Mulugeta Belay, who has been my source of inspiration, and to my beloved mother for her unconditional love and prayers. Father: you are forever remembered.

I also dedicated this thesis to my friends who were on my side during the difficult times and my beloved wife Sara Sete. We travelled the long journey together, the roles you played in this study are equally important. We managed to keep the friendship together through the difficult times.

To all the staff members at Tikur Anbessa Hospital Physiotherapy Department, your belief in me helped me to realise the dream you had for me. You can now be proud that the dream has come true.

Finally, I dedicate my thesis to all the people who are living with low back pain including me. You served as the mouthpiece for the community of Ethiopia who are not heard about their lived-experiences in the horror of pain experience.

DECLARATION

Name: **MENGESTIE MULUGETA BELAY**

Student number: **62028383**

Degree: **DOCTOR OF LITERATURE AND PHILOSOPHY**

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I declare that the above thesis is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I submitted the thesis to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at Unisa for another qualification or at any other higher education institution.

January 2020

MENGESTIE MULUGETA BELAY   Date

ACKNOWLEDGEMENTS

ABSTRACT

Background: The magnitude of LBP has increased in recent years. It has remained neglected with profound negative impact on the society. The risk factors continue to increase throughout communities as a result of limited preventive methods.

Aim: The aim of this study was to offer in-depth exploration of cultural and social factors in vulnerability to LBP in order to develop a culturally sensitive integrated preventative model in Addis Ababa, Ethiopia.

Methods: A sequential explanatory mixed methods research design was employed to investigate the complex phenomenon of the study. Quantitative and qualitative data was collected through a combination of data collection tools that included interviewer-administered questionnaires and semi-structured interviews from both the back patients and healthcare providers in each of the selected public hospitals. Participants with back pain and healthcare providers working in the public hospitals were identified and sampled through a simple random sampling and purposive sampling technique, respectively.

Findings: In the first phase, 170 participants took part in the study. Back pain is a multifactorial disorder, where the contributions of bio-medical and cultural factors for its occurrence are noteworthy. Chi square analysis showed a statistical association between seventeen variables of interest related to the participant group of individuals affected by LBP.

In the second phase, back patients perceived that they were predisposed to LBP due to lack of knowledge and awareness on available prevention methods. Additionally, healthcare providers were blamed for their limited involvement in awareness-building about the severity and impacts of LBP. The low awareness rates were associated with increased risk of the development of LBP among the productive group of the community members.

Conclusions: Prevention of LBP should not be seen as only involving bio-medical factors bust also other influences that include cultural and social factors. The emergent model has the benefit of integrating bio-medical, cultural and social modifiable factors for the prevention of LBP.

Key concepts: LBP, culture, modifiable risk factors, non-modifiable risk factors, socio-demographic factors, psychosocial factors, work-related factors, socio-cultural factors.

LIST OF ACRONYMS USED IN THE STUDY

AARHB	Addis Ababa Regional Health Bureau
AAU	Addis Ababa University
ADL	Activities of Daily Living
AIDS	Acquired Immunodeficiency Syndrome
APH	Amanuel Psychiatry Hospital
BMI	Body Mass Index
CI	Confidence Interval
CNS	Central Nervous System
DALYs	Disability-Adjusted Life Years
FMoH	Federal Ministry of Health
GBD	Global Burden of Disease
GMH	Gandhi Memorial Hospital
GTQs	Grand Tour Questions
HBM	Health Belief Model
HCPs	Healthcare Providers
HIV	Human Immune Virus
HMIS	Health Management and Information System
IASP	International Association for the Study of Pain
IDIs	In-Depth Interviews
ILO	International Labour Organisation
KIIs	Key Informant Interviews
LBP	Low Back Pain
LMICs	Low- and Middle-Income Countries
MH	Minilik II Hospital
MM	Mengestie Mulugeta

MRI	Magnetic Resonance Imaging
NHA	National Health Account
NRS	Numeric Rating Scale
ODI	Oswestry Disability Index
OPD	Outpatient Department
OR	Odds ratio
P	Probability Level
PICOT	Population, Intervention, Comparison, Outcome, Timeframe
PTSS	Post-Traumatic Stress Syndrome
RCTs	Randomised Controlled Trials
RDH	Ras Desta Hospital
SD	Standard Deviation
SNNP	South Nations Nationalities and Peoples
SPMMC	St. Paul Millennium Medical College
SPSS	Statistical Soft Ware Package
SPTSH	St. Peter TB Specialised Hospital
SRS	Simple Random Sampling
TAH	Tikur Anbessa Hospital
TBH	Tirunesh Beijing Hospital
TV	Television
UNISA	University of South Africa
USA	United States of America
VAS	Visual Analogue Scale
WHO	World Health Organisation
Y12H	Yekatit 12 Hospital
ZMH	Zewditu Memorial Hospital

ORGINISATION AND STRUCTURE OF THE STUDY

Chapter 1:   **Orientation to the study**

The chapter provides a summary of the study that includes the introduction, and background of the study, purpose of the research and objectives of the study.

Chapter 2:   **Literature review**

Chapter two provides the literature review of the study and it reviews literary sources of the literature related to the prevalence and risk factors of LBP. The chapter includes the identification of knowledge gaps in the literature relating to the key concepts of the study.

Chapter 3:   **Theoretical grounding**

The chapter explains the descriptions of the bio-medical model, biopsychosocial model, the six constructs of the health belief model and theories of pain. The chapter offers conceptualisation of the models chosen for the study.

Chapter 4:   **Research design and methodology**

The methodological chapter of the study presented the philosophical stances of the researcher and the quantitative and qualitative phases of the study. It also presented the rationale for the researcher's chosen the pragmatist stance, mixed methods and sequential explanatory mixed method designs for the study.

Chapter 5:   **Data analysis and presentation of the quantitative phase**

The quantitative findings are presented in this chapter. The data analysis and presentation are outlined in the form of tables and graphs. The modifiable and non-modifiable risk factors of LBP were also outlined in this chapter.

Chapter 6: **Data presentation and analysis of the qualitative phase**

The chapter provides the qualitative data collection, presentation and analysis. The chapter presents the findings in a separate two sections as in-depth interviews and key informant interviews based on the themes generated from the open-ended questions of the study. The chapter also presents the influence of cultural beliefs on the development of LBP.

Chapter 7: **Data interpretation, discussion and model development**

This chapter provides interpretations and integration of the two phases of the study, the model development process and implications for future researchers. The developed culturally sensitive integrated preventative model from the literature and findings from the study are also presented in this chapter.

Chapter 8: **Conclusions, limitations and recommendations**

Based on the findings of the quantitative and qualitative phases of the study, the chapter presented conclusions to address the research questions outlined at the introduction of the study. Additionally, limitations of the study and study recommendations are provided.

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CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

Low back pain is one of the most prevalent musculoskeletal disorder. Over the decades it has become an increasingly noteworthy health problem primarily because of its high prevalence among working adults and secondly, because of its largely incurable nature and the poor prognoses associated with it. Recent studies continued to confirm that Low Back Pain (LBP) is a common disorder across all nations globally. It is estimated that about 80% of all populations will experience LBP at some period during their lifetime (Suri, Boyko, Smith, Jarvik, Frances, Williams, Jarvik & Goldberg 2017:2-3).

The prevalence rate varies between developed and developing countries. A multi-country study estimated that the average one-year prevalence of LBP was 37.3% in developed countries and 41.1% in developing countries (Bener, Dafeeah & Alnabi 2014:28). Notably, the prevalence rates appear to be significantly higher in non-western countries. This is supported by a study done in rural South Africa among adult populations, which estimated that the prevalence of LBP was 42.9% (Rezaee, Ghasemi, Jafari & Izadi 2011:23). Similarly, a systematic review conducted across a number of countries in Africa showed that the average prevalence of LBP was 62% in adult African populations (Louw, Morris & Grimmer-Somers 2007:1). Another study done in Nigeria among rural farmers showed a prevalence of 67.1% (Ogunbode, Adebusoye & Alonge 2013:1). Notably, a numbre of studies done in Addis Ababa among different occupational categories estimated the prevalence of LBP was 64.2% among taxi drivers, 47.1% among aircraft technicians, and 45.8% among nurses (Belay, Worku, Gebrie & Wamisho 2016:113; Melaku, Samson & Ayele 2015:2 & Zungu & Nigatu 2015:18). These studies confirmed that a special focus was required to understand and explore the influence of cultural beliefs on the occurrence of LBP.

Despite wide agreement that LPB represents a devastating health problem, its reported prevalence varies depending on the definition used by the researchers (Yiengprugsawan, Hoy, Buchbinder, Bain, Seubsman & Sleigh 2017:1). This is supported by the fact that

fundamental social, cultural, and economic disparities between countries further aggravate the problem (Bener, Dafeeah & Alnabi 2014:28). It is becoming a challenge for medical communities not least because of the lack of agreement about how LBP is diagnosed and the way it is differentially accepted as an illness. There is currently no gold standard diagnostic entity and it is well documented that physicians continue to use different diagnostics frameworks (Bath, Trask, McCrosky, Math & Lawson 2014:1962). Furthermore, there is little acknowledgement of the cultural variations that exists. Due to those unsolved disputes, LBP is recognised as a dynamic, fluctuating, and complex syndrome with a complex pathogenesis pathway (Melaku, Haimanot & Shiferaw 2012:45). Premature morbidity and mortality from non-communicable diseases has also increased for the past two decades. At a global level, diabetes and LBP causes 70% and 43% of disability-adjusted life years (DALYs). In North Africa and the Middle East, diabetes and LBP increased by 87% and 77% respectively. As a result of this, LBP is placed in the non-communicable diseases list as third next to ischemic heart disease and stroke (GBD 2015:15 & World Bank 2013).

The prevalence of LBP has reached epidemic proportions with several factors contributing to its development (Brady, Hussain, Brown, Heritier, Billah, Wang, Teede, Urquhart & Cicuttini 2016:3 & Hoy, Bain, Williams, March, Brooks, Blyth, Woolf & Buchbinder 2012:2028). The perception and reporting of LBP might be impacted inversely by the family structure, area of living, social expectation, social support, poverty, beliefs, religion, daily social environment, and availability of healthcare system (Williams, Ng, Peltzer, Yawson, Biritwum, Maximova, Wu, Arokiasamy, Kowal & Chatterji 2015:2-3). These factors have a significant contribution on the diagnosis, acceptance of LBP as a disease, decisions made by the patients, the range of acceptable prevention methods and notably, medical treatments.

Cultural differences affect patient's ability to understand, manage, and cope with the course of an illness. The occurrence and persistence of LBP is therefore, partially determined by individual perceptions and understanding the meaning of pain. A patient with strong religious beliefs may have better mechanisms to manage pain and get support from families (Rodrigues, Fernández, Martín, Blanco, Blanco, Moro & Alburquerque

2016:2). Thus, it could be mediated mainly by cultural, social, and bio-medical factors. The bio-medical factors that modulate the occurrence of LBP include poor working environments, poor transportation, and carrying of heavy loads (Rodrigues et al 2016:2).

Even patterns of health care utilisation are culturally differentiated between those that believe in western medicine and those that believe LBP can be culturally attended to. As expected, causal explanations may differ between traditionalists and those that accept western medicine. The primary models of prevention have been based on biomedicine and several countries and researchers have, by contrast shown a strong socio-cultural basis for LBP so much so, that there have been questions about whether existing western models are adequate to prevent LBP (Rodrigues et al 2016:412). This is due to the fact that Ethiopia is culturally very different from the western world and has different day-to-day manual activities, differences in how pain is perceived, and adopts different approaches to managing pain; - factors which may further make existing preventative models ill-suited to the task of guiding prevention. Therefore, an in-depth exploration of the influence of cultural and social factors in the vulnerability to LBP was crucial in order to develop a culturally sensitive integrated preventative model.

1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM

1.2.1 Definition and classification of low back pain

The descriptions related to the definition, classification, and diagnosis of LBP are fraught with uncertainties (Chidobe, Kitchen, Sorinola & Godfrey 2017:779). Some Authors defined LBP as "sensations or discomfort in the back between scapula and buttock, with radiation" (Quittan 2002:423) and some other define LBP as "pain in the lumbosacral region" (Tulder, Becker & Bekkering 2006:169). Similarly, most researchers classified LBP by duration as acute (lasts less than 6 weeks), subacute (lasts within 6-12 weeks) and chronic (persists for more than 12 weeks) (ILO 2017). Whereas, different authors classified it based on its aetiology into six categories as: mechanical, infectious, inflammatory, metabolic, neoplastic and visceral (Chidobe et al 2017:779; ILO 2017 & Melaku, Haimanot & Shiferaw 2012:45). It also classified on the causative agents as specific (known pathophysiology mechanism) and non-specific - unknown causes (Khan,

Uddin, Chowdhury & Guha 2014:50). Due to the varied definitions and classifications, LBP is recognised as a dynamic, fluctuating, and complex syndrome with a complex pathogenesis, high rate of incidence, recurrence, and recovery (Melaku, Haimanot & Shiferaw 2012:45).

1.2.2 Prevalence of low back pain

Low Back Pain is fast becoming the burden for our planet (Louw et al 2007:2). Its prevalence varies from country to country (Benjaminsson, Biguet, Arvidsson & Wikmar 2010:641). A quarter of the Australian population are suffered from LBP (Wilk, Palmer & McLachlan 2010:534). Likewise, a cross-sectional study done in Brazil showed a 72% prevalence of LBP (Falavigna, Braga, Monteiro, Marcon, Castilhos, Bossardi & Conzatti 2015:359). Additionally, the prevalence of LBP was estimated to be 63% in Bangladesh, 58.7% in Israel, 57% in Iran, 54% in Qatar, 32% in Italy, and 30% in Thailand (Arunsawas, Boonshuyar & Aimyong 2017:152; Bener, Dafeeah & Alnabi 2014:227 & Khan et al 2014:50. It is reported in different occupational settings and estimated to be 34% in rural Tibetans farmers and 41% in Shanghai textile factory workers (Yiengprugsawan et al 2017:1).

The annual prevalence of LBP in developing countries is higher than that of developed countries (Bener et al 2014:28). A community-based cross-sectional study conducted among rural farmers in Nigeria showed a prevalence of 67.1% (Birabi, Dienye & Ndukwu 2012:1) and 46.8% in urban population (Ogunbode et al 2013:1). On the other hand, the prevalence of LBP in Mulago Hospital, Uganda, was estimated to be 20% (Yilmaz & Dedeli 2012:599). Another study conducted in the Rift Valley region of Ethiopia showed prevalence of 21.7% (Melaku, Haimanot & Shiferaw 1997:44). Relative to these findings, a community-based cross-sectional done in rural southwest Ethiopia reported a prevalence of 16.7% (El-Sayed, Hadley, Tessema, Tegegn, Cowan & Galea 2010:90). Even so, the proportion of LBP in Ethiopia has yet to be conclusively determined.

1.2.3 Risk factors associated with low back pain

The exact aetiology of LBP continues to be contested. Studies of the relationship between tissue insult, injury, and pain have provided varied results and as such, current knowledge

cannot determine the exact medical causes (Wilk et al 2010:533). The environment in which people live and work is now broadly understood to be related to LBP development. Taking into account the context in which sufferers live, it can be expected that rural and urban areas have their unique cultures and pain experiences (Arthritis today 2008:5-7).

Generally, the risk factors associated with LBP are largely categorised into; socio-demographic, lifestyle, work-related and psychosocial factors (O'sullivan & Lin 2014:8). Those factors can be grouped into modifiable factors that include; sedentary lifestyle-patterns, smoking, poor exercise habits, prolonged standing and awkward posture and non-modifiable factors which include; age, sex, and history of LBP (Khan et al 2014:50 & Ogunbode et al 2013:2). Similarly, excessive fluoride ingestion and vitamin D deficiency can lead to LBP. This is supported by a study done in the Rift Valley of Ethiopia, which concluded that LBP was associated with excessive fluoride ingestion, due to the deposition of fluoride in the spine and surrounding ligaments (Benjaminsson et al 2010:641).

1.2.4 Consequences of low back pain

Low back pain continues to be an important public health problem (Bener et al 2014:228). It is the most devastating disease that leads to significant disability (Shemory, Kiel, Pfefferle & Gradisar 2015:413 & Yang, Haldeman, Lu & Baker 2016:460). It is a serious health problem in terms of its associated high rates of morbidity, health care expenditure, and comorbidity that leads to mortality (Williams et al 2011:128). It affects communities by hampering the quality of life, impeding social life, healthcare and socio-economic costs (Hoy et al 2012:2028 & Wand, Parkitny, O'Connell, Luomajoki, McAuley, Thacker & Moseley 2010:1). It adversely affects individual's quality of life by deteriorating sleep, physical performance, cardiovascular health, social, and occupational activities (Ogunbode et al 2013:2 & Shemory et al 2015:413). Back patients are also highly susceptible to relapses, physical disabilities and psychological distresses (Nazzal, Saadah, Saadah, Al-Omari, Al-Oudt, Nazzal, El-Beshari, Al-Zaabi & Alnuaimi 2013:153).

Back pain is used as a source of compensation claims in the working society. It is estimated that 50% of costs in the industrialised world are related to compensation for

workers (Kjaer, Korsholm, Leboeuf-Yde, Hestbaek & Bendix 2017:1). A study done by Sinha (2017:932-934) stated that majority of workers are lost to their workplace for at least six weeks due to LBP. As a result of being related to work, it significantly affects workers' fitness level and leads to high rate of compensation and this adds to concerns about the severity of pain, re-injury, and job insecurity (Chien, Huang & Shaw 2005:362). In addition to compensation costs, disability due to LBP contributed to 28% of restriction of daily activities, 58% of sleep disturbance, 42% to the reasons provided for seeking medical treatments, 40% of premature statutory age retirements, 23% toward work absenteeism, 60% changed working places, one-third of unemployed peoples and poorer households (Sinha 2017:932). The longer they had been absent from workstation, the greater the jeopardy of everlasting omission from the labour market.

1.3 RESEARCH PROBLEM

Low back pain is the most common musculoskeletal disorder among working age groups in Ethiopia. A range of studies done in Addis Ababa among different occupational settings estimated the prevalence of LBP as 64.2% in taxi drivers, 47.1% in aircraft technicians, and 45.8% among Nurses (Belay et al 2016:113; Melaku, Samson & Ayele 2015:2 & Zungu & Nigatu 2015:18). The majority of the cases are in the ages between 31-64 years and are within their most productive years (Yiengprugsawan et al 2017:1). It is placed second by years lived with disability next to iron deficiency anaemia and third by DALYs next to stroke and major depressive disorders (GBD 2015:2-3).

It is also a major public health problem in terms of personal, social, economic, and healthcare burdens (Hoy et al 2012:1 & Yang et al 2016:459). Loss of function and disability are the two commonest consequences of LBP (Nazzal et al 2013:153). Similarly, back patients are advised by their physicians to take rest and reduce activities that might compromise their physical fitness and predispose them into deconditioning that leads to the incidence of chronic medical conditions like; dyslipidaemia, hypertension and chronic heart disease (Williams et al 2015:1). Due to this, LBP increased the annual mortality rate of elderly by 13% in the year leading to 2014 (Bener et al 2014:228).

In the era of sustainable development goals, dominated by prevention of most communicable diseases, LBP has remained neglected despite its profound debilitating effect on the society. The magnitude of LBP has increased in recent years and its primary risk factors are evident throughout the community. Healthcare professionals and societies have failed to present effective preventative strategies and have been unable to promote primary prevention strategies. Their primary involvement has been in assisting people to cope, rather than prevent, their pain. There is a need for measures that prevent LBP and counter the increasing prevalence.

The range of socio-cultural factors have directly or indirectly interacted with each other and with other bio-medical factors to escalate the incidence of LBP (Falavigna et al 2015:359). In order to take preventative action against the occurrence of LBP among different segments of the community, effectiveness may be negatively impacted by the influence of cultural beliefs that contradict expected western norms (Brady et al 2016:3). This has acted to further influence way how differing cultural beliefs about LBP have negatively impacted on health service uptake especially in light of the important acceptance that existing western approaches to prevention are not a perfect fit for Ethiopia. The current study takes note of this contradictory picture and proposes the development of an eclectic preventative model that integrates western bio-medical interventions with culturally based interventions. There is a lack of scientific harmony about the influence of cultural and social factors and the association between LBP and western bio-medical prevention methods (Brady et al 2016:3).

The causes of LBP have a complex origin and development pathway that includes bio-medical, cultural and social factors. To this end, current knowledge has shown limited application potential in explaining how western bio-medical interventions can be modified to fit Ethiopia's specific culture (Bener et al 2014:228). Therefore, this research is intended to identify the key bio-medical and cultural modifiable factors and the influence of cultural beliefs on the development of LBP in order to develop a culturally sensitive integrated preventative model for the prevention of its occurrence among populations in Addis Ababa, Ethiopia.

1.4 AIM/PURPOSE OF THE STUDY

1.4.1 Research aim/purpose

The study aims:

➢ To develop a culturally sensitive integrated preventative model for the prevention of LBP after an in-depth exploration of cultural and social factors in vulnerability to LBP among people aged 18 and above in Addis Ababa, Ethiopia.

The first phase of the study was a quantitative inquiry to describe the demographic profile of individuals affected by LBP, to identify factors associated with the development of LBP, to ascertain the prevalence and severity of LBP and to recognise the bio-medical and culture based risk factors of LBP by conducting a survey on back patients. The qualitative phase followed up on the first phase to offer an in-depth exploration of the modifiable risk factors of LBP and the influence of cultural beliefs on the development of LBP among back patients and healthcare providers in the study area.

1.4.2 Research objectives

The study had five objectives. These were:

1. To describe the demographic profile of individuals affected by low back pain in Addis Ababa,
2. To identify factors associated with the development of low back pain in Addis Ababa,
3. To ascertain the prevalence and severity of low back pain in Addis Ababa,
4. To identify and describe the bio-medical and culture based modifiable risk factors of low back pain in Addis Ababa,
5. To explore the influence of cultural beliefs on low back pain among patients in Addis Ababa,
6. To develop a culturally sensitive integrated preventative model for the prevention of LBP.

1.4.3 Research questions/hypothesis

The study also had corresponding specific research questions:

1. What is the demographic profile of individuals affected by LBP in Addis Ababa?
2. What are the factors associated with the development of LBP in Addis Ababa?
3. What is the burden and severity of low back pain in Addis Ababa?
4. What are the bio-medical and culture based modifiable risk factors for LBP in Addis Ababa?
5. How do cultural beliefs influence the development of health promoting and health jeopardising behaviours in the development of LBP among individuals in Addis Ababa?
6. What are the key bio-medical and cultural factors that support the prevention of LBP among the population of Addis Ababa?

1.5 SIGNIFICANCE OF THE STUDY

Low back pain is a common disorder second by years lived with disabilities next to iron deficiency anaemia and third by DALYs next to stroke and major depressive disorders. It has become the enigma of the medical community and presents serious day-to-day challenges of the working group of the society. This study was mainly intended to develop a culturally sensitive preventative model for the prevention of LBP. This will have allowed an evidence-based prevention strategy for the community and relevant stakeholders. The final result of the paper will help the policy makers to have an emphasis on it and to critical investigate how it affects the working group of the society by impairing quality of life. As a result, the results from the current study can be used as baseline biodata for interested researchers in the field of study. The researcher considers that the study provides an important contribution to the following areas.

1.5.1 Significance for policy

The study identified and explored the key bio-medical and cultural modifiable factors of LBP and the influence of cultural belies on the development of LBP. These may be essential as methods to prevent the disorder and will inform decision makers and

programme planners to make informed action plans and interventions to prevent the disorder.

1.5.2 Significance for practice

The study significantly contributes to the country's efforts to ascertain its burden and recognise the modifiable risk factors by informing the responsible bodies to examine thoroughly, the way they prevent and manage LBP. The researcher considers that, as a result of being grounded by the current findings, recommendations and the proposed preventative model; policy makers and healthcare providers will take practical measures to prevent the development of LBP.

1.5.3 Identification of the knowledge gap

Although, different studies have failed to identify the modifiable risk factors of LBP and the influence of cultural and social factors, there is no best fitting culturally dependent integrated preventative model for the prevention of LBP available in Ethiopia. Furthermore, researchers did not used a model in their study to prevent its occurrence. Thus, there exists a huge gap in existing knowledge about the prevention of LBP and it is asserted here that this was a key basis for conducting a comprehensive study.

Ascertaining the key modifiable risk factors from the perspectives of back patients' and expert knowledge from the healthcare providers could help to offer insights into the prevention methods of LBP in the study setting. Furthermore, the process of synthesising and analysing the literature related to the modifiable factors of LBP assisted the researcher to identify the relevant knowledge gaps. There were several issues that were identified in the literature that required further investigation such as:

1) The varying prevalence and severity of LBP in different settings,
2) The associated risk factors are only linked to bio-medical factors and the influence of cultural and social factors in vulnerability to LBP was largely unexplored and needed to be explored further,

3) Irrespective of the presence of prevention strategies in different parts of the world, the available prevention methods were not culturally sensitive and only determined by the bio-medical factors, and

4) The available preventive methods did not integrate the bio-medical, cultural and social factors in respect to the cultural context of the community where they are living and working.

Therefore, this is the first comprehensive study that ascertained the bio-medical and culture based modifiable factors and further strengthened the findings with in-depth exploration of the influence of cultural and social factors in vulnerability of LBP in Ethiopia. This assisted the researcher to develop an integrated culturally sensitive preventative model for the prevention of LBP in the study area.

1.5.4 Contributions to the body of knowledge

The already conducted studies related to this topic emphasised only the prevalence and associated risk factors of LBP. In acknowledgement of the fact, the use of a mixed method design and the triangulation of the survey, IDIs and KIIs in this study provided enriched data of the phenomena of LBP prevention. On the other hand, the development of LBP can be influenced by cultural and social factors. The health belief model which formed the basis of the study assisted the researcher to identify relevant knowledge gaps related to participants' perceived susceptibility and severity of LBP, barriers and benefits of available prevention methods, and cues to take action and self-efficacy for the existing methods. The pertinent findings of the study were used to prevent the development of LBP in different settings.

1.6 DEFINITIONS OF KEY CONCEPTS

Low back pain is pain in the lumbar spine localised between the lower margins of the 12th rib and gluteal folds at least one episode for the past one-year with or without leg pain, which is diagnosed by medical personnel (Ehimario, Igumbor, Puoane, Gansky & Plesh 2011:7).

Modifiable risk factors are risk factors someone can take measures to reduce the chance of getting the specified disease (British Heart Foundation 2011:1).

Non-modifiable risk factors are risk factors no one cannot control their effect, to reduce the chance of getting a disease (British Heart Foundation 2011:1).

Socio-demographic risk factors are a group of risk factors which can be presented by their sociological and demographic features (Beeck & Hermans 2000:14).

Psychosocial risk factors are factors influencing the well-being of an individual from the individual and the structure or function of social groups (Beeck & Hermans 2000:15).

Work-related risk factors are a specific type of inherent risk factors that are related to the working environment related to a specific job (Kilbom, Armstrong, Buckle, Fine, Hagberg, Haring, Martin, Punnet, Silverstein, Sjongaard, Theorell & Viikari 1996:240).

Socio-cultural factors are customs, traditional beliefs and religious practices within specific cultures and communities that affect the feelings, thoughts and behaviours of its people (Peacock & Patel 2008:6).

Culture is defined as a collection of learned behaviours, beliefs and attitudes towards the modifiable risk factors and back ergonomic practices that are characteristics of the back patients (Peacock & Patel 2008:6).

Culture dependent modifiable factors are those bio-medical and culture-based factors that promote occurrence of back pain among healthier individuals.

Back patients are defined as patients presented in the follow-up clinics with the signs and symptoms of back pain and diagnosed with having LBP by healthcare providers.

Prevention is defined as the range of methods used to prevent the development of low back pain among healthier individuals (Ali & Katz 2015:322).

Integrated refers to a combined, interconnected or joined presentation of the bio-medical, culture-based and social factors.

The model is defined as a diagrammatical presentation of interrelated risk factors of low back pain that may be used to study its characteristics (Concise Oxford Dictionary 1987:650).

1.7 THEORETICAL FOUNDATIONS OF THE STUDY

1.7.1 Research paradigm

Research paradigm is a research culture shared by a researcher with a common set of beliefs, values, and assumptions to answer complex research questions. It has four basic components; ontology (the researcher's assumptions are within the domain of nature of reality to answer the research questions), epistemology (researcher assumptions on producing an acceptable knowledge that can be obtained from the observable phenomena), axiology (the role of values in research and researcher's stance) and methodology (the conceptual framework behind the research process) (Neuman 2014:94-96). In this research, the pragmatist paradigm was followed by considering the ontology, epistemology, axiology, and methodology axioms.

The pragmatist paradigm is a philosophical view that uses mixed methodologies in a single study to facilitate a complex understanding of the research problem (Creswell 2009:204). The choice of this paradigm was deemed appropriate because the development of LBP has a complex origin that required that both positivist and constructivist paradigms were followed (see section 4.3).

For this study, singularly using either quantitative or qualitative methodologies was not enough to answer the research questions. Therefore, the rationale for using mixed method research was premised on the acceptance that quantitative methodologies were needed to ascertain the factors, prevalence, severity, and consequences of LBP. Secondly, qualitative methods were used to conduct an in-depth exploration of the influence of cultural and social factors in vulnerability to LBP and lastly, they were used to widen the scope, to highlight facts from different sources, to produce comprehensive insights, and to triangulate findings in order to develop the model (Creswell & Plano 2011:5).

This study follows a sequential explanatory mixed methods approach guided by the bio-medical and health belief models to identify the modifiable bio-medical and cultural factors, and the influence of cultural beliefs on the development of LBP among individuals. Within this, the bio-medical, health belief and pain theory models were employed to identify the key modifiable factors associated with the development of LBP.

1.7.2 Assumptions and philosophical views

There are different assumptions and philosophical views regarding the existence and nature of reality (ontology) and how these realities are investigated and known (epistemology). The researcher believed that the research questions asked in this study would be best answered via reliance on the pragmatist paradigm. The pragmatist paradigm is a mixed methods approach that advocates the integration of various approaches and assumptions in a single study to have broader and in-depth perspectives about a single complex phenomenon of interest (Creswell 2003:11).

In this study, the researcher argues that the development of LBP and the research questions were complex enough to justify the reliance on both quantitative and qualitative methods to provide detail and depth of understanding about the phenomenon of interest.

Positivist and post-positivist paradigms were used for the quantitative aspect of the study to quantify the demographic profile of individuals affected by LBP, identify factors associated with the development of LBP, ascertain the prevalence of LBP, and recognise the key bio-medical and culture based modifiable risk factors of LBP among back patients. A structured close-ended questionnaire was used in the first phase of the study.

For the qualitative phase, constructivist and transformative paradigms were utilised after phase one data collection and analysis. Pertinent findings of the quantitative phase were utilised to inform the development of semi-structured open-ended questions utilised for the qualitative phase. The qualitative phase of the study was conducted to explore modifiable bio-medical and cultural factors of LBP and the influence of cultural beliefs on the development of LBP.

Finally, pertinent findings of the first and second phases of the study were integrated and interpreted to provide detail and depth of information about the modifiable risk factors of LBP in the study area. Based on the findings generated from the literature and two phases of the study, the preventative model was developed to prevent occurrence of LBP among healthier individuals in Addis Ababa.

1.7.2.1 Ontological assumptions

The researcher assumed that the actual world is always the product of structured explanations and inner subjectivity. He held the view that, as a researcher, he held a hybrid of realist and nominalist ontological assumptions and this set of assumptions acted as a vehicle to support the identification of the modifiable risk factors of LBP and explore the influence of cultural beliefs on the development of LBP among the population in the study area.

1.7.2.2 Epistemological assumptions

Epistemological assumptions are methods that the researcher follows to answer the research questions. They assist the researcher to determine the most efficient way of gaining knowledge (Neuman 2014:94). The bio-medical and health belief models allow the researcher to integrate the quantitative and qualitative phases to have a comprehensive insight on the study of interest. They provided a framework to describe the demographic profiles of individuals affected by LBP, identify factors associated with the development of LBP, ascertain the prevalence of LBP, recognise the bio-medical and cultural factors of LBP and explore the influence of cultural beliefs on the development of LBP. The preventative model portrays a crucial role for the prevention of LBP among healthier individuals. Within these approaches, different research techniques and tools were used rigorously to maintain the scientific rigor of the knowledge generated from the study.

1.7.2.3 Methodological assumptions

In this study, the researcher employs sequential explanatory mixed methods approach. First, the quantitative approach was conducted to describe the demographic profile of

individual affected by LBP, identify factors associated with the development of LBP, ascertain the prevalence of LBP, recognise the bio-medical and cultural factors of LBP through interviewer administered questionnaires among back patients. Second, the qualitative approach offers an in-depth exploration of modifiable bio-medical and cultural factors and the influence of cultural beliefs on the development of LBP based on the lived-experiences of back patients and the views of healthcare providers. The researcher used in-depth interviews and key informant interviews within the study.

1.7.3 Theoretical framework

A theoretical framework is a group of statements explaining the relationship between dependent and independent variables thought to have an effect on the phenomenon under study (Vosloo 2014:299). There are different formats of a conceptual framework that explains the development of LBP among different segments of the community. As described in the purpose of the study, the development of the culturally sensitive integrated preventative model for the prevention of LBP is developed based on the combined appreciation that bio-medical, cultural and social factors can determine the occurrence of LBP. The Norasteh (2012:88) framework, has clearly identified the bio-medical factors of LBP. The study is designed based on the theoretical grounding that socio-demographic, lifestyle, work-related and psychosocial factors can determine its occurrence. If these risks are not prevented early, the affected individuals will be subjected to activity restrictions, absenteeism from their work and an increased reliance on healthcare services. The conceptual framework of the study is presented in figure 1.1 below.

The first factors are socio-demographic factors that include: age, gender, marital status and educational level. As a human ages, degenerative changes of their intervertebral discs and lumbar spine increases and further hastens the development of LBP. It is also argued that, occurrence of LBP is determined by gender. Thus, women are more prone to LBP due to the nature of work they perform and vast home-based activities. Individuals with lower educational status have a higher chance of developing LBP. This is due to that physically demanding and energy consuming work, that is mostly likely to be done by people with lower educational status.

Secondary factors are lifestyle factors that include lifestyle, smoking, alcohol, exercise habits and sleeping behaviour. Sedentary lifestyles could predict the occurrence of LBP. Additionally, drinking alcohol and smoking can lead to the development of LBP by lowering blood supply to the tissues in the lumbar spine. By contrast, performing physical activities can hinder the development of LBP. Good exercise habits can prevent the occurrence of LBP by promoting flexibility of soft tissues, enabling tissues to strengthen and promote endurance among individuals to perform tasks.

Socio-demographic factors
- Age
- Gender
- Marital status
- Educational level

Lifestyle factors
- Lifestyle
- Smoking
- Alcohol
- Exercise habit
- Sleeping material

Work-related factors
- Occupation
- Workload
- Prolonged sitting/standing
- Awkward posture

Low Back Pain

Psychosocial factors
- Social support
- Stress
- Anxiety
- Depression

Impacts of LBP
- Activity restrictions
- Health care utilisation

Figure 1.1 The bio-medical model: the relationship between LBP and socio-demographic, lifestyle, work-related, and psychosocial factors: *modified from Norasteh (2012:88).*

The third-category factors relate to work-related factors and include occupation, workload, prolonged sitting and standing and the adoption of awkward body posture. Occupations which need prolonged sitting and standing and light jobs which had low energy demands led to the occurrence of back pain. Similarly, workload that demands high energy and required different body postures like frequent bending, twisting, rotation/vibration can increase the risk of developing LBP (Beeck & Hermans 2000:11-33).

The last category of factors included psychosocial risk factors such as poor social support, stress, anxiety and depression. These listed variables are directly or indirectly related to increasing individual susceptibility to back pain. But the main component of pain-related perception is fear of pain leads to decrease physical activities. Back patients remain sedentary by thinking movement will cause pain. Such types of behaviour act as determinants because decreased recreational activities lead to development of further impacts that impacted emotional wellbeing (Langevin & Sharman 2006:2-6). If these factors are not eliminated or reduced before the healthier individual develops back pain, they ca lead to additional restrictions with respect to daily activities and their ability to access healthcare facilities for the pain they complained about in the first place.

Therefore, this conceptual framework diagram helps the researcher to focus on factors that may contribute to the development of LBP. Moreover, it enables the linking of observations, facts, and other concerns together into an orderly scheme and it also supports the development of data collection tools. Finally, this diagram will lead to the development of a preventative model that can be used by a responsible body to teach the community. The fact that the current focus of the study is on complex issues and for that reason, more than one theoretical framework was integrated into the study. The study was heavily focussed on the influence of cultural and social factors have effects on health behaviours, then the health belief model (HBM) is introduced to have a clear understanding of the research problem.

The HBM was one of the oldest employed psychological models of health behaviour and remains the most widely recognised model to explain and predict cultural beliefs of individuals on health promoting and health jeopardising behaviours. It was developed in

the 1950s by Hochbaum, Rosenstock and Kegels working in the USA Public Health Services. It assists to understand behavioural problems, develop prevention methods based on relevant determinants, and for evaluating the effectiveness of these methods. The HBM investigates why people fail to undertake preventive health measures to protect themselves from risk behaviours. It focuses mainly on health motivators; therefore, it is most suitable for addressing behavioural problems that have health consequences. It has been shown to successfully predict the healthy eating behaviour, weight, and obesity management (Orji, Vassileva & Mandryk 2012:9).

It is based on the core assumptions and statements that people are ready to act if they:

1. Believe they are susceptible to low back pain (perceived susceptibility),
2. Believe back pain has serious consequences (perceived severity),
3. Believe taking action would reduce their exposure to back pain or its severity (perceived benefits),
4. Believe costs of taking action (perceived barriers) are balanced by the benefits,
5. Are exposed to factors that early action (cues to action), and
6. Are assured in their capacity to effectively achieve an action (self-efficacy).

During application of the HBM, practitioners should focus on the understanding of how susceptible the target population feels to LBP, whether they believe it is serious, and whether they believe action or prevention strategies can reduce the threat at an acceptable cost. Therefore, HBM will be used in this study during the first phase in order to identify specific factors that influence the occurrence of LBP to develop a culturally sensitive integrated preventative model.

1.8 RESEARCH DESIGN AND METHEDOLGOY

1.8.1 Research design

The research design is a logical roadmap of research method. It shows a philosophical assumption about how the study could be conducted and how data is collected and analysed. Mixed method research is a combination of the quantitative and qualitative method for data collection, analysis, and interpretation (Neuman 2014:308). In this study,

the researcher applied both quantitative and qualitative designs, more explicitly a sequential explanatory mixed methods design, was conducted. The research design and methodology for this study is discussed according to the phases of the study.

In the first phase, quantitative study, analytical cross-sectional study design was employed to:- (i) describe the demographic profile of individuals affected by LBP, (ii) identify factors associated with the development of LBP, (iii) ascertain the prevalence of LBP, and (iv) recognise the bio-medical and cultural factors of LBP. A structured close ended questionnaire was utilised to generate reliable and valid numerical data from back patients.

The second qualitative phase followed the first phase and utilised open-ended questions to deal with insider perspectives. In this phase, the researcher employed a phenomenological approach through in-depth interviews with back patients and key informant interviews with healthcare providers, to generate trustworthy data. It was intended to explore the modifiable bio-medical and cultural factors of LBP and the influence of cultural beliefs on the development of LBP.

The two phases were integrated during the integration phase of the study to allow full descriptions of the research report and to develop the culturally sensitive integrated preventative model with the necessary modifications.

The structural overview of the research methodology is presented in the following diagram.
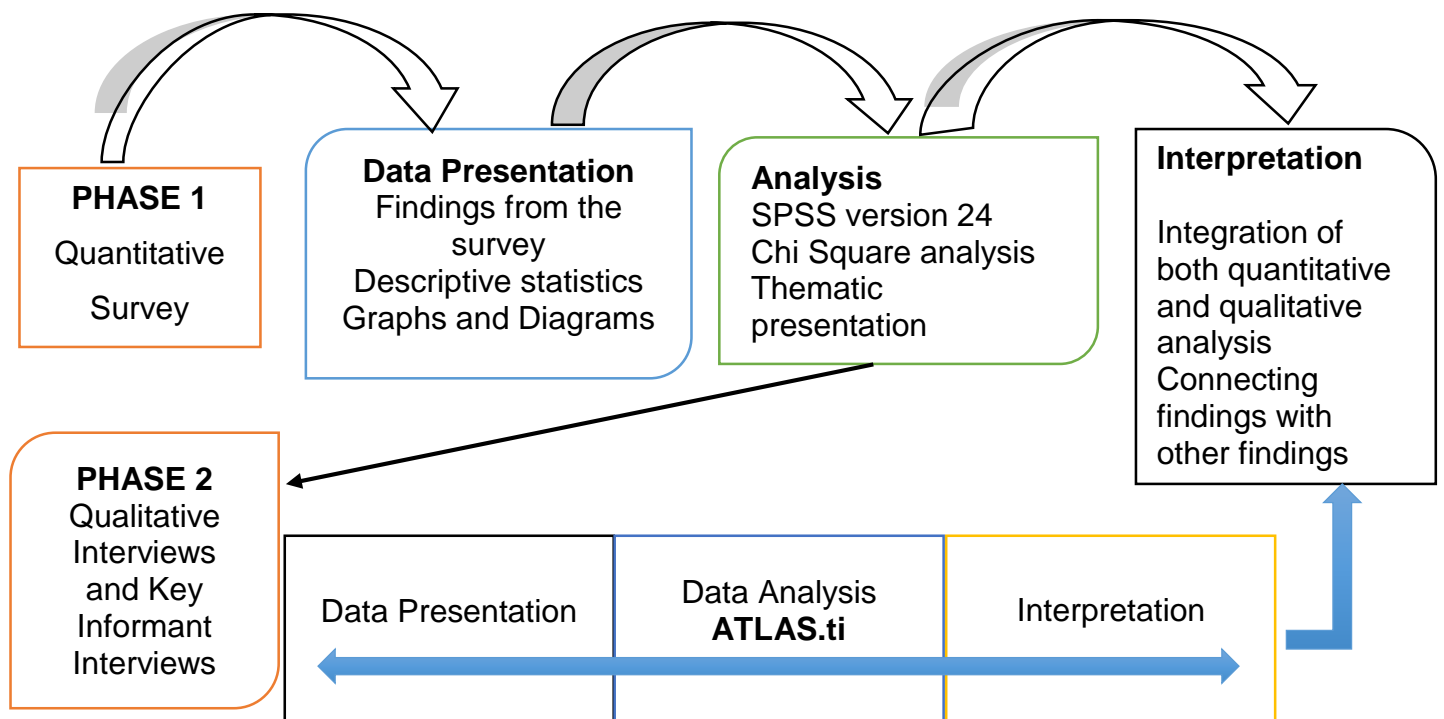
Figure 1.2 Structural overview of the research methodology

1.8.2 Research methods

As described above, both quantitative and qualitative designs, more specifically a sequential explanatory mixed method design was employed. The first phase was a hospital based analytical cross-sectional survey. It utilised a structured close-ended, interviewer administered questionnaire to deal with the quantifiable data. It was mainly utilised to ascertain the associated factors, prevalence, severity, and consequences of LBP among back patients.

The second phase was also a hospital based explanatory study which provided detailed explorations about the modifiable risk factors of LBP, the influence of cultural beliefs on the development of LBP, lived experiences of back patients and clinical expertise knowledge of healthcare providers. In-depth interviews were conducted with eighteen back patients to generate textual data on the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours. Key in-depth interviews were also conducted with eight healthcare providers in order to explore their clinical knowledge and understanding. Interviewees were also probed to reflect their

views on the modifiable bio-medical and cultural factors and the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours related to the development of LBP.

1.8.2.1 Research setting

This research was conducted in Addis Ababa the capital city of Ethiopia, located in the central part of the country. According to the Ethiopian Population and Housing census of 2007, Addis Ababa has a population of 3 273 001 (PCC 2008:7). In the city there were eleven public hospitals and fortyone private hospitals. From the total of eleven public hospitals that are found in Addis Ababa, the researcher stratified them based on the services they provided for patients. Based on this, three hospitals (St. Peter TB Specialised Hospital, Ghandi Memorial Hospital and Amanuel Psychiatry Hospital) were excluded from the list. This was done due to the fact that they are only offering services for tuberculosis, maternity and psychiatry. Then, among the remaining eight public hospitals, three hospitals (37.5%) were selected by using a simple random sampling technique. Finally, the total sample size required was reached by proportionally allocating respondents form each of the selected public hospitals. For the first phase, the total sample size required was proportionally allocated. For the second phase, back-patients and healthcare providers were selected from each department. Figure 1.3 below presents map of the study site.

1.8.2.2 Study population

Population refers to all individuals of interest to the researcher. The target population is a set of members of study subjects in which generalisation will be done (Pandey & Pandey 2015:40-43). A study population is the group that is studied, either in total or by selecting a sample of its members (Neuman 2014:94-96). The target population for the study was all back patients who were attending follow-ups in the eight public Hospitals of Addis Ababa. While the study population was back patients that were randomly selected from the three public hospitals. The actual study population for the first phase of the study was all back-patients and for the second phase, it was back patients and healthcare providers who were directly involved in the care of back patients. The first phase of this study

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included consenting back patients. Within this, those patients who did not provide written consent or were too ill to participate, were excluded. For the second phase, healthcare workers who were not available at their workstation due to annual leave or any other case were excluded.
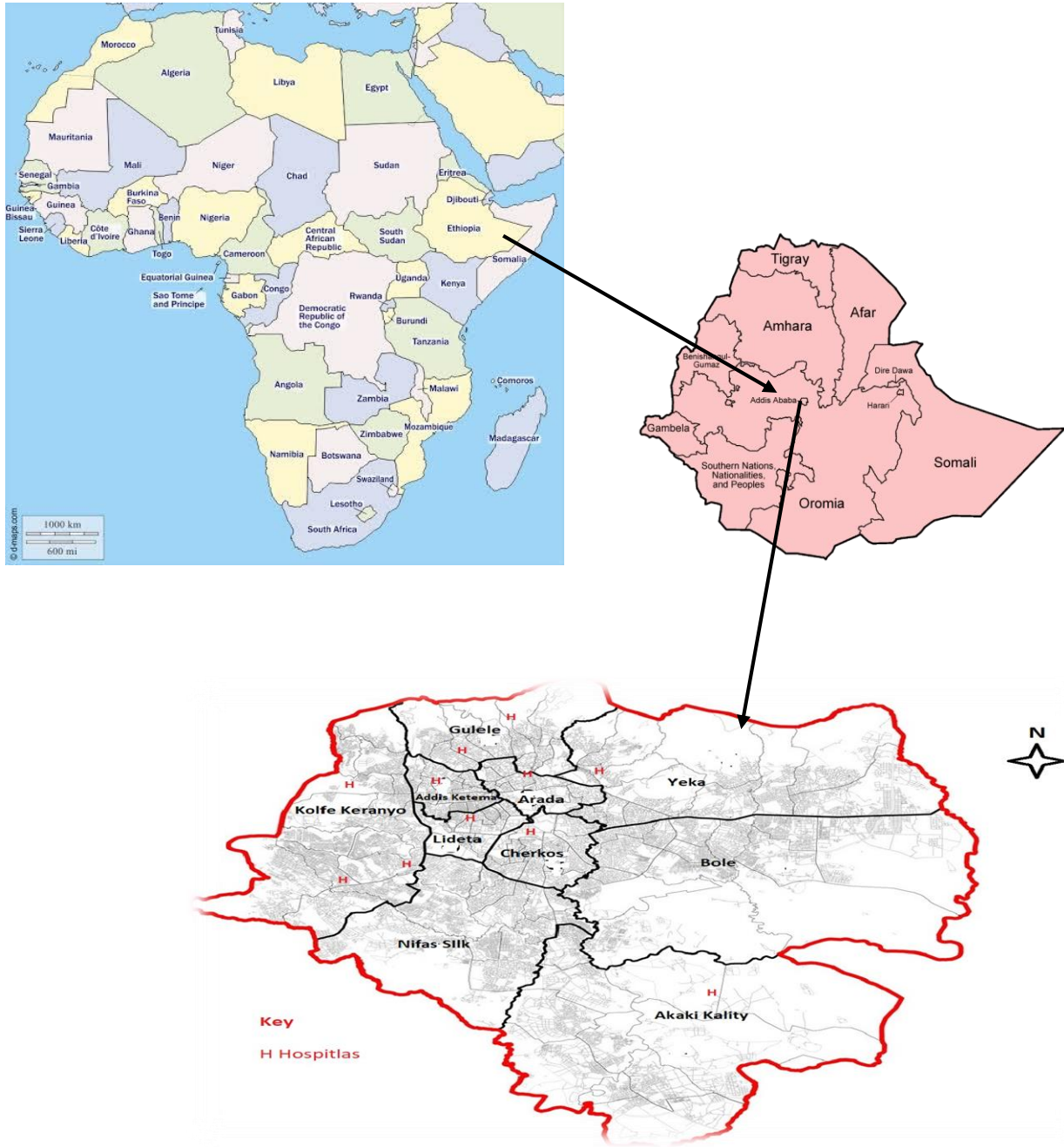
Figure 1.3 Map of the research site

1.8.2.3 Site sampling

For the first phase, a simple random sampling technique was employed to select the study sites. First, the hospitals were classified into general and specialised hospitals. Specialised hospitals were excluded on the list because they are offering clinical services which were not related to back pain. From eight public hospitals, three hospitals were selected randomly to be included in the study. Then the selected hospitals were further classified into different departments based on the functional structure of the hospital. After that the departments offered clinical services for back patients were selected purposively to facilitate easier tracing of back patients and healthcare providers.

1.8.2.4 Sample size determination

Each of the quantitative and qualitative phases of the study has their own philosophical assumptions regarding the determination of sample size and sampling methods. For the first phase of the study, the minimum required sample size was determined utilising a single population sample size calculation formula. The researcher conducted a simple systematic random sampling technique to select 171 study participants from three public hospitals in Addis Ababa. This was conducted by using the lists of the patients that were found at the outpatient clinics were used as a sampling frame. Then, the first study subject was selected by using a lottery method after calculating the sample interval using an equation of $K^{th} = N/n$. After randomly selecting the first study subjects, the researcher selected the consecutive subjects by adding the specified case intervals.

The second phase of the study focuses on generating rich textual data from interviews on the study of interest. The back patients and healthcare providers were selected by using a purposive sampling technique. The sample size was determined by the researcher when data saturation was achieved. Hence, a total of eighteen in-depth interviews (nine males and nine females) were employed. Similarly, eight key informant interviews with two neurologists, one neurosurgeon, two orthopaedists, and three physiotherapists were conducted. The third phase of the study was an integration phase for the findings from each of the phases.

1.8.2.5 Data collection

In this study, the researcher collected primary data in two phases through utilising different data collection methods. For the quantitative phase, the researcher designed the questionnaire from the literature identified during literature searches with the guiding of bio-medical and health belief model. A structured questionnaire has been utilised to interview the study participants. This was further strengthened through reviewing patients' medical documents and in-depth exploration within the qualitative phase of the study. Pertinent findings from this phase enabled the researcher to develop the data collection tools for the qualitative phase. During this phase, IDIs were conducted with back patients and key informant interviews (KIIs) with healthcare providers by using semi-structured, open-ended questionnaires. The data collectors collected numerical data and the researcher collected textual data from the study participants.

The qualitative phase of the study was focused on the description and in-depth understanding of the development of LBP within the naturalistic, social, or cultural contexts (Creswell 2007:51). The qualitatively gathered data provided tangible meaning to the phenomena entailed in the research topic (Creswell 2009:211). Here, the results identified from the quantitative phase of the study were explored in-detail. The qualitative data collection process entailed the non-statistical organisation of the views and experiences of the study participants (Cornwell 2009:15).

1.8.2.6 Data analysis

In the study, the researcher sequentially employed both quantitative and qualitative data analysis methods based on the numerical and textual data generated from the study participants.

1.8.2.6.1 Data analysis of the first phase

In the first phase, survey instrument was utilised to identify the outliers during the analysis of the data. The collected data has been entered into *Epi-Info 3.5.4* and was exported to and analysed by using the statistical package for the social sciences (SPSS) (*Windows Version 25.0 Chicago IL, USA*). The descriptive statistical summary that includes

percentage, mean and standard deviations was computed. Chi square was used to assess the relationship between the demographic profile of individuals affected by LBP with the risk factors. A probability level of 0.05 or less and 95% confidence level was used to indicate the statistical significance

1.8.2.6.2 Data analysis of the second phase

For the qualitative data, data analysis was done by using *Atlas.ti* software. After coding, the transcribed data sub-themes and themes were developed to present and analyse the textual data. Thematic content analysis that was emerged from the quantitative phase of the study has been used to analyse the data and also newly emergent themes were incorporated on the findings in order to widen the scope of the study (see chapter six).

1.9 VALIDITY/TRUSTWORTHINESS

There are various criteria utilised to know the scientific rigour of the study within mixed methods research.

1.9.1 Validity of the quantitative phase

In the quantitative method, reliability and validity are the two important indicators utilised to generate pertinent findings.

1.9.1.1 Reliability

Reliability is collecting the same set of data more than once using the same questionnaires and getting similar results under related conditions (Ranjit 2011:170). Reliability was ensured by (i) carefully designing the questionnaires; (ii) legitimating the data; and (iii) lending credibility to the research report.

1.9.1.2 Validity

Validity means the ability of an instrument to measure what it intended to measure and can inferences possible beyond the study subjects (Ranjit 2011:166). Internal and external validity are the two important concepts that the researcher should focus on during planning a quantitative approach.

1.9.1.2.1 Internal validity

Internal validity refers to the extent of the relationship that exists between the collected data and the research problem (Ranjit 2011:170). Internal validity was achieved by using a homogenously selection criteria of samples, designing accurate measurement tools, and utilising comparison groups.

1.9.1.2.2 External validity

External validity is generalising the findings outside the study settings or study subjects (Ranjit 2011:170). External validity was done by selecting the study subjects randomly and reinforcing the finding with other similar/different studies. Selection of the samples randomly enables the researcher to draw samples of representative from the back patients. Hence, the results of the study can be generalised to Addis Ababa.

1.9.2 Trustworthiness of the qualitative phase

Trustworthiness in the qualitative research has several different indicators to achieve a scientific rigor. It includes credibility, dependability, conformability, and transferability (Ranjit 2011:172). These criteria are described in the following sub sections:

1.9.2.1 Credibility

Credibility is the magnitude in which the collected and analysed qualitative data are believable within the constructed social phenomena by reflecting the lived-experiences, opinions and feelings of the study participants exactly (Ranjit 2011:172). Credibility was secured by evaluating the study methods by recording audios, prolonged engagement, debriefing, submitting transcripts to the study subjects and using a logical framework.

1.9.2.2 Dependability

It is the extent in which research findings are replicated within similar circumstances (Ranjit 2011:172). The researcher secured dependability of the study through having clear research questions, in-depth explanations of the study methodology, and keeping field notes and audio tapes.

1.9.2.3 Confirmability

It is the degree in which the final result of the findings can be repeatedly confirmed by other researchers (Ranjit 2011:172). Confirmability of the research findings was maintained by using representative samples by means of systematic approaches, a different discipline of healthcare providers, reflexivity document reviews, and tick descriptions. The researcher maintains confirmability of the study through clearly stating all his philosophical assumptions, procedures, methods, values and biases in the process of the research.

1.9.2.4 Transferability

Transferability is the finding of the qualitative research can be generalised out of the study settings (Ranjit 2011:172). The researcher achieved this criterion through clearly stating all his approaches, assumptions and all other important information in detail. Detailed information about validity and trustworthiness are described at chapter four of the document.

1.10 ETHICAL CONSIDERATIONS

In order to respect and secure the human rights of the study participants, the researcher proceeded in line with the following steps:

1.10.1 Ethical clearance

Letter of permission was obtained from the Ethics and Higher Degrees Research committee of University of South Africa (UNISA) and Federal Ministry of Health of Ethiopia and was submitted to Addis Ababa Regional Health Bureau. Then they wrote a supporting letter to those selected public hospitals. The permission letter and support letter were presented to those selected public hospitals (see Annexe C and Annexe D).

1.10.2 Informed consent

The study participants for this particular study were back patients aged 18 years and older. In order to obtain informed consent, the researcher provided information regarding to the aim of the study, study expectations for the participants, procedures for voluntary

participation and competency from the study subjects. Participating in this study was absolutely voluntary (see Annexe E).

1.10.3 Anonymity and confidentiality

The study participants were assured that their personal information was not disclosed to a third party. Confidentiality was ensured by using of a code system to protect identity of the participants and at the same time to identify the questionnaire.

1.10.4 Principle of self determination

The participants' personal dignity and human rights as study subjects were wholly respected. They were informed that they could refuse or discontinue participation at any time they wanted, and they had the chance to ask anything about the study. They had full rights to refuse responding to any question and if they did not want to participate, they could opt out at any stage of the study.

1.11 SCOPE OF THE STUDY

The main aim of this study was to develop a culturally sensitive integrated preventative model for the prevention of LBP. The final result was confined to Addis Ababa only because that was where data collection was carried out. Before generalising the findings to other settings in Ethiopia, further study will be necessary.

The first phase of the study is cross-sectional design which is hard to develop a cause-effect relationship between the variables of interest. By using analytical cross-sectional design can help to develop a cause-effect relationship. However, the data gathered in the second phase of the study might be predisposed into researcher's bias. Besides this, the analysis was time-consuming, and it was difficult to have a visual presentation. This could have been minimised by using qualitative software and submitting the transcripts to the study subjects to correct errors.

1.12 STRUCTURE OF THE THESIS

This thesis is structured based on the eight chapters of the document as follows:

Chapter One: Orientation to the study introduces the reader to the study of interest.

Chapter Two: Literature reviews revises the preceding findings of different researchers.

Chapter Three: Theoretical framework outlines the conceptual models of the study.

Chapter Four: Research design and methodology presents the overall procedures of the study.

Chapter Five: Data analysis and presentation of the quantitative phase of the study.

Chapter Six: Data presentation and analysis of the qualitative phase of the study.

Chapter Seven: Integration, interpretation and model development process.

Chapter Eight: Conclusion, limitations and recommendations of the study.

1.13 SUMMARY

Generally, the prevalence of LBP is increasing in the developing countries. Inability to prevent its development by utilising an effective and efficient preventive strategy in the community escalates the burden of the disease. Furthermore, cultural and socio-economic variances between different countries were shown to be related to the failure of the available western prevention strategies. The study explores the modifiable bio-medical and cultural factors and the influence of cultural beliefs on the development of LBP to develop a culturally sensitive integrated preventative model. Therefore, the main aim of this study was to provide an in-depth exploration of the phenomenon of LBP through introducing different research methods and tools from both the quantitative and qualitative aspects in order to produce a valid body of knowledge.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter provided an overview of key elements of the study. As acknowledged earlier, no previous research has empirically explored the influence of cultural and social factors in vulnerability to LBP in order to develop a culturally sensitive integrated preventative model, particularly within the Ethiopian context. Ethiopia has long-standing challenges related to the prevention of non-communicable diseases and marginalisation of the healthcare financing system, which makes this an urgent focus area worthy of research attention. Low back pain is a devastating health-related disorder, especially in resource-restricted countries. The associated material deprivation along with living within a complicated environment further increases the occurrence of LBP. In order to provide a comprehensive overview of existing knowledge related to LBP; a logical, systematic, and exclusive search of the related literature was conducted to determine the current evidence.

A literature review is defined as a comprehensive inquiry which centres on identifying, extracting, appraising, and synthesising evidence and existing knowledge within the area of interest to be investigated (Creswell 2014:34). Similarly, Aveyard (2014:1) define literature review as analysing, summarising, and interpreting literature in a systematic way as one seeks answers to a research question. The literature review is a vital tool that enables appraising and synthesising of the topic under study. This could be conducted logically as a basis for understanding the areas of strength and weakness within all available literature on a topic. During reading of the literature within the topic, the researcher could discover the most detailed type of literature review. A systematic review is striving to search systematically all the available sources on the topic (Aveyard 2014:10).

Neuman (2014:127) classifies the literature review into six types, including a context review, historical review, integrative review, methodological review, self-study review, and theoretical review. Similarly, Cronin, Ryan & Coughlan (2007:4) classified literature

reviews into four sub-types that include a narrative review, systematic review, meta-analysis, and meta-synthesis. The researcher eclectically combines the features of each type in this literature review process. Additionally, the literature that the researcher has utilised was organised via integrating, criticising, and identifying the main findings of previous scholarly w.orks (Creswell 2014:29).

Literature could be accessed mainly from books, journals, dissertations, newspapers, reports, official documents, policies, Television, radio, professional meetings, and the internet (Neuman, 2014:127). For this study, almost all the literature was accessed from a combination of the internet search from local and international resources and also via the inter-library loan system. This enabled the researcher to have access to those resources that were available from other academic institutions to which the university library was affiliated. This further assisted in obtaining an adequate number of literary sources related to the research topic.

The rationale for conducting a literature review was to provide a theoretical background of relevant studies, including contemporary perspectives related to the development of a culturally sensitive integrated preventative model for the prevention of LBP. This also allowed the researcher to consolidate existing evidence-based knowledge on the field of inquiry. In other words, the purpose of the literature review was to avoid duplications and stimulate new ideas for further research in the subject area. Literally, the literature review permits the researcher to define the research questions, develop a conceptual framework, and select appropriate investigative methodologies. In addition, it helps to integrate current research findings into what has already known. Finally, the objective of the literature search was to critically appraise arguments, theories, and controversies regarding the occurrence of LBP (Creswell 2014:27 & Ranjit 2011:46-55).

This chapter explains in detail about (i) the data search strategy, (ii) inclusion and exclusion criteria, (iii) appraisal of identified articles, (iv) hierarchy of evidence, and (v) the core emerging themes from the literature. This further present sources and evidences related to the development of a preventative model for the prevention of LBP. The focus of literature is socio-demographic factors, lifestyle factors, work-related factors,

psychosocial factors, severity and impacts of LBP and the influence of cultural and social factors in vulnerability to LBP.

2.2 THE DATA SEARCH STRATEGY

The above-mentioned focus of the literature was utilised to assist the researcher to track down relevant studies on the development of a culturally sensitive integrated preventative model for the prevention of LBP. In order to answer the research questions, reviewers must follow a ˝strict protocol'' by using explicit and rigorous methods (Aveyard 2014:10). As explained by Aveyard, Sharp and Wooliams (2011:41) and Polit and Beck (2014:129-135), the researcher could develop a comprehensive data search strategy to gather all available relevant sources based on the research questions which contain the following key components:

1. (P) - The population who are the sample of study subjects,
2. (I) - The intervention employed for the study subjects,
3. (C) - The comparison or context where the study is conducted
4. (O) - The outcome of interest that the model will bring, and
5. (T) - The timeframe where the study was published.

The above five components of the research questions assisted the researcher to develop a focused and efficient data search strategy. Hence, in this study, the search focuses on people who are adult back-patients as study subjects. It is focussed on developing a culturally sensitive integrated preventative model as the intervention, both developed and developing countries as a context, prevalence of LBP, severity of LBP, impacts of LBP, ascertaining the risk factors of LBP, and exploring the bio-medical and culture-based modifiable risk factors as the outcomes of interest, and studies published after 2012 as a timeframe.

Initially, a hardcopy search of literature sources was conducted in the Addis Ababa University (AAU) Library to search for books and reputable journals. Searching of literature at the library is an appropriate gateway to gather all important and alternative sources. The initial request for the literature (via the university librarian) focussed on search terms related low back pain, musculoskeletal disorders, and spinal pain. Then,

health-related electronic databases were searched by using keywords and gave a wider range of literature. The researcher tried to comprehensively search all available literature databases in order to gather important sources and acquire reviewing skills. The literature reviews and commentaries by experts and stakeholder organisations that have a special interest on LBP websites were also incorporated into the research.

Before starting the hardcopy and electronic database searches, the formulation of a list of keywords was decided on accordingly. In order to decide keywords, to organise relevant literatures, and to appraise arguments, a mind map was used throughout the review process. The mind map was used within an initial brainstorming session and a guide to understand the development of a culturally sensitive integrated preventative model for the prevention of LBP (see figure 2.1 below).

A mind map is a process of developing a new idea from an initial idea from literature review questions (Aveyard 2014:24). Though, ascertaining keywords for the topic before initiating any inquiry search would enable the researcher to obtain relevant findings. This could further augment the number and range of elicited alternative keywords with most commonly used similar meanings. The use of alternative keywords assisted in broadening the researcher's initial understanding of the research topic and the research questions (Creswell 2014:32).

Prevalence of LBP   Severity of LBP   Pain   Disability   Healthcare Utilisation

Impacts of LBP

MAIN TOPIC: AN EXPLORATION OF CULTURE DEPENDENT MODIFIABLE RISK FACTORS FOR LBP: - DEVELOPING INTEGRATED PREVENTATIVE MODEL

Modifiable Risk Factors   Prevention of LBP   Preventative Model

Lifestyle Factors   Work-related Factors

Socio-demographic factors   Psychosocial Factors

Figure 2.1 The mind map used to organise the literature review

The researcher tracked recently published books and journals related to influence of cultural and social factors in vulnerability to LBP from different databases through the internet. This was done because the initial hardcopy library search did not reveal many current sources. Academic libraries at AAU, UNISA, and Addis Continental Institute of Public Health was searched to access electronic databases. The researcher further accessed the e-resources that were not older than five years and seminal influential works were the exception to this rule. These e-resources were accessed from HINARI, ERIC, Google Scholar, PubMed, Ovid, the UNISA Repository, ProQuest, and EBSCOhost search engines.

During searching of electronic databases, Boolean operators AND, OR, and the wildcard symbol were utilised to narrow and broaden the relationships between keywords. This was conducted by utilising keywords individually to narrow search results and then combined to broaden exploratory search of the literature. The asterisk- * wildcard was used to replace low back pain as a root word to capture all alternative words (Zanker & Mallett 2013:8). As the study focus became more narrowed and focused on the research

topic, the following keywords were used: -

1. Prevalence and low back pain,
2. Severity and low back pain,
3. Consequences or impacts and low back pain,
4. Socio-demographic risk factors and low back pain,
5. Lifestyle risk factors and low back pain,
6. Work-related risk factors and low back pain,
7. Psychosocial risk factors and low back pain,
8. Modifiable risk factors and low back pain,
9. Non-modifiable risk factors and low back pain,
10. Socio-cultural factors and low back pain, and
11. Influence of culture and low back pain.

2.3 INCLUSION AND EXCLUSION CRITERIA

During the conducting of the literature search, it was accepted that using only published data could bias the review processes. Then reviewer could develop an appropriate strategy to retrieve and include only relevant studies that were relevant to the research questions. Subsequently, the researcher appraised the selected literatures based on the predetermined criteria to assess the reliability and validity of the collected literatures. This is to ensure that to include only high-quality literatures that were relevant to the research questions. This process is literally known as an inclusion and exclusion criteria. Finally, the findings of all the literature that was identified and included in the review, were integrated together using a rigorous systematic approach (Aveyard 2014:11). The rationale of using an inclusion and exclusion criteria was to identify pertinent literature in order to answer the specified research questions.

During the sorting process of the searched sources, literature which was not relevant and related to the research questions was excluded and saved in a different folder. While the pertinent sources that supported the study under inquiry and provided answers to the research questions were retained and arranged accordingly. The initial primary search identified 397 full-text works of literatures and twelve additional works of literatures were

searched from grey literature, cross-references, and official websites for possible review. The following inclusion and exclusion criteria were used to include only relevant literature that were related to the development of a culturally sensitive integrated preventative model for the prevention of LBP and the research questions.

2.3.1 Inclusion criteria

Inclusion criteria are a criteria used to retrieve only relevant literatures addressed by the literature review to answer the research questions (Aveyard 2014:11). In this study, the following inclusion criteria were utilised to identify the searched literature for the prospective review process:

- Studies published in the English language.
- Studies published after 2012 (inclusive, and except seminal influential studies).
- Low back pain studies done in any geographic location.
- Studies involved adult study subjects (age ≥18 years) with or without leg pain.
- Studies that focused on the prevalence and severity of low back pain.
- Studies that discussed risk factors of low back pain.
- Studies focused on the prevention of low back pain.
- Studies focused on the socio-cultural aspects of low back pain.
- Studies conducted in quantitative methods, qualitative methods, or mixed methods.
- Studies with alternative search titles of lumbago, backache, aching back, painful back, bad back, slipped disk, disc prolapse, sciatica, radiculopathy, degenerative lumbosacral disease, screening, and prediction.
- Relevant grey literature (literature found outside the peer-review channels) and authorised websites.
- Given the debates that exist regarding the authenticating of published data from the internet, only literature from validated institutional databases were considered for the review.

2.3.2 Exclusion criteria

Exclusion criteria are criteria used to discard or disqualify literature from inclusion in the prospective review (Aveyard 2014:11). The following exclusion criteria were utilised to discard literatures from the review process:

- Publications which were written in a language other than English.
- Articles published before 2012, as they were considered to be out-dated.
- Studies included study subjects with pain in other body regions.
- Published abstracts.
- Studies which were not peer-reviewed and for which, academic credibility could not be authenticated.

After applying each of the above inclusion and exclusion criteria, only twenty-four original research sources met the inclusion criteria. Two seminal literature sources were retrieved through manual search and cross-reference analysis. Those included literature satisfied the academic and scientific rigor expectations for inclusion in the prospective literature review processes. Here, it is essential to critically appraise all of the twenty-four specifically identified relevant research sources and included literature reviews and seminal literature related to the study and development of a culturally sensitive preventative model for prevention of LBP. The primary research studies that fully satisfied the inclusion criteria were reviewed in the following sections. The process of selecting literature sources that would be included in the review processes is diagrammatically presented below.
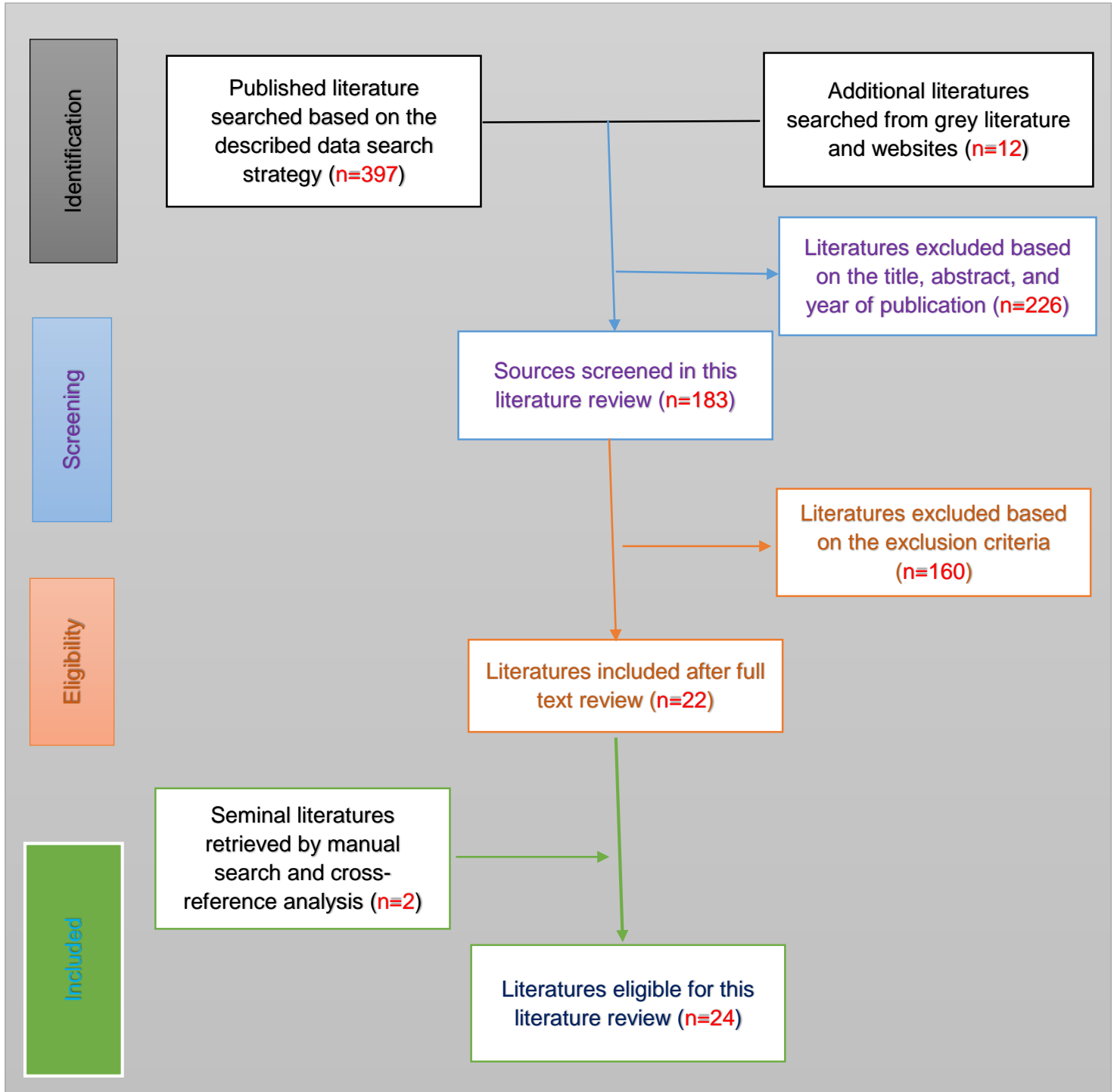
Figure 2.2 Flow diagram of literature for inclusion within the literature review

2.4 APPRAISAL OF IDENTIFIED STUDIES FOR THE LITERATURE REVIEW

Table 2.1 below provides a summary of each of the primary and secondary searched studies included within this literature review. The summarised review table offers details on the Author(s), year of publication, Journal, sample size, study design, study population, objectives, and results or claims of the study. The studies included in the review explored the influence of cultural and social factors in vulnerability to LBP from the varied approaches in population and data collection instruments. The included studies focus on a range of study populations and they offer data from patient's perspectives, community-based perspectives, and different occupational perspectives. The studies included have focussed on a variety of methodologies including systematic reviews, quantitative surveys, and healthcare database studies.

In addition to the differences in methodology, the review included studies from different settings such as neurology, neurosurgery, physiotherapy, and orthopaedics outpatient clinics – all of which were reviewed and critically appraised. A critical appraisal is the structured assessment of the relevance, value, and trustworthiness of a published output (Aveyard 2014:104). The rationale of using a critical appraisal was to segregate different literature according to its quality, credibility and its relevance to the specified research questions. An appraisal also enables the researcher to analytically examine the strengths and limitations of information presented in different peer-reviewed journals and other sources. Similarly, it was used to assess the value of different literary sources in terms of their, purpose, and the knowledge contribution it made (Neuman 2014:127).

It was important to not that there are different types of ''critical appraisal tools'' and for this particular study, the process of critical appraisal was guided by the MetaQAT tool developed by the Ontario Public Health Libraries Association and Aveyard et al (2011). The MetaQAT tool provided a comprehensive framework appraisal process that focussed on the relevance, reliability, validity, and applicability of identified literature sources. The tool also integrates different appraisal tools to provide a more detailed and rigorous examination of the included literature (Rosella, Pach, Morgan & Bowman, 2015:2-4). Additionally, the appraisal tool developed by Aveyard et al (2011) is short and could be utilised in analysis of different types of literature. The heterogeneity of public health

evidence requires a generic and flexible utility tool that can be used to appraise literature across different research topics.

The review of included studies was weighted on the basis of current knowledge-contribution on the development of a culturally sensitive preventative model for the prevention of LBP. Generally, pertinence and rigor of identified literature was critically appraised in terms of the relevance, reliability, validity, and transparency of the literature (Polit & Beck, 2012). In addition to ascertaining the main findings that authors were presenting, it was important to be consistently critical and analytical in the way that each of the included papers were assessed within this review. The critical appraisal of studies assessed the author(s) apparent clarity in the formulation of the study question(s), the selected methods that were used within their research, the sample sizes, the procedures for collecting data, the central arguments, the findings, limitations of the study, and the way in which data was handled. In addition to the above-mentioned criteria, the researcher also considered the generalisability of the findings to other settings and the relevance of the research questions raised in the current study. Before engaging in the critical appraisal of specific studies, hierarchy of evidence issues are discussed.

Table 2.1 Summary of reviewed primary research studies included in the literature review

Author/ Date/Journal	Sample Size/Design/ Study population	Research Objectives	Results/ Claims
Bener, Dafeeah & Alnabi (2014) - Asian Spine Journal	N=2 600 (Cross-sectional) back patients attending primary healthcare centres in Qatar.	To determine the prevalence and impacts of LBP on lifestyle habits.	The prevalence of LBP is 56.5%. It is highly prevalent among both genders and older age. Weakness in the legs, smoking, prolonged standing/sitting were contributed to the development of LBP. It continues to be an important public health problem.
Shemory, Kiel, Pfefferle & Gradisar (2015) - Orthopaedics	N=26 435 080 (Explorys Cohort) Pooled electronic databases across USA	To identify modifiable risk factors and relative risks of LBP.	Patients presented with nicotine dependence, obesity, depressive disorders, and alcohol abuse were risky for LBP.
Suri, Boyko, Smith, Jarvik, Frances, Williams, Jarvik & Goldberg (2017) - The Spine Journal	N=7 108 (cross-sectional co-twin control) Vietnam Era Twin participants in USA	To examine the association of modifiable lifestyle and psychological factors with lifetime LBP.	The lifetime prevalence of LBP was 28%. Modifiable lifestyle risk factors of LBP were confounded by familial and genetic factors. But severe obesity, depression and PTSS$^\$$ should be considered as the modifiable risk factors of LBP.
Machado, Ferreira, Maher, Latimer, Steffens, Koes, Li & (2016) - The Spine Journal	N= 999 (Case-crossover) Back-patients attending at primary care clinics in New South Wales, Australia	To examine the association between physical and psychosocial activities and LBP.	The prevalence of persistent LBP was 42.3%. Its development was associated with lifting heavy loads, awkward postures, live with people or animals, vigorous physical activity and physical capacity.
Zungu & Nigatu (2015) - Occupational Health Southern Africa	N=294 (cross-sectional) Aircraft technician in Ethiopian Airlines	To determine the prevalence of LBP and its risk factors.	The prevalence of LBP was 47.1%. It is significantly associated with working experiences, pulling/pushing/lifting/carrying heavy loads and working in an awkward body posture.
El-Sayed, Hadley, Tessema, Tegegn, Cowan & Galea (2010) - SPINE	N= 550 (Cohort) Community-based in Gilgel Gibe Growth and Development Study, Jimma	To assess the prevalence and psychopathologic correlates of LBP.	LBP was reported among 16.7% of the respondents. Anxiety were most prevalent psychopathology at 41.9%, followed by depression at 36.1% and PTSS at 10.3%. The majority (61.8%) of the study population was between 20-29 years of age.
Shmagel, Foley, & Ibrahim (2016) - Arthritis Care & Research	N=5 103 (cross-sectional) National Health and Nutrition Examination Survey in the US Adults	To describe the epidemiological characteristics and associations with increased health care utilisation in US adults with chronic LBP.	Chronic LBP is associated with age 50–69 years, less than high school education, annual household income, compensation claims, depression, sleep disturbances and medical comorbidities. Subjects with chronic LBP were more likely to be visited healthcare providers more frequently and claimed for insurance.

Author/ Date/Journal	Sample Size/Design/ Study population	Research Objectives	Results/ Claims
Bath, Trask, McCrosky, MMath & Lawson (2014) - S*PINE*	N=25 545 (cross-sectional) Adults (age ≥ 18years) with LBP Urban and Rural dwellers in Canada	To compare rural- and urban-dwelling adults with self-reported chronic back disorders.	There were a significant socio-demographic and lifestyle differences between rural and urban Canadians with LBP. These differences may have implications for the design and delivery of more equitable and appropriate health services as well as health promotion and prevention efforts.
Ogunbode et al (2013) - *African Journal of Primary Health Care*	N=485 (cross-sectional) Adult patients attending the General Outpatients' Clinic in Ibadan, Nigeria.	To determine the prevalence of LBP and associated risk factors	The point prevalence of LBP was 46.8%. Dysmenorrhea, previous back injury, occupational activities and tobacco smoking were associated with LBP. The prevalence of LBP is high, with preventable and treatable predisposing factors. Public health efforts should be directed at educating people on occupational activities and lifestyle habits.
Louw, Morris, & Grimmer-Somers. (2007) - *BMC Musculoskeletal Disorders*	A systematic review of 27 eligible studies among African population	To systematically appraise the published prevalence studies to establish the prevalence of LBP in Africa.	The majority of the studies (63%) were conducted in South Africa and Nigeria (26%). The mean LBP point-prevalence among adults was 32%, 50% one-year prevalence and 62% average lifetime prevalence of LBP. The prevalence of LBP is rising in Africa and is of concern.
Chidobe, Kitchen, Sorinola & Godfrey (2017) - *Disability and Rehabilitation*	Qualitative, semi-structured, in-depth interview among 30 participants in rural Nigeria	To explore the experiences of people living with non-specific chronic low back. pain (CLBP) in a rural Nigerian community.	The back pain beliefs were related to manual labour/deprivation, infection/ degeneration, spiritual/cultural beliefs and rural–urban divide. CLBP^ related disability strongly influenced by beliefs that facilitate coping strategies that either enhance or inhibit recovery.
Frank, Shannon, Norman, Wells, Neumann & Bombardier (2001) - American Journal of Public Health	N= 316 (case–control) Modern automobile production complex workers in Ontario Canada	To determine the association between physical and psychosocial demands of work with LBP.	Risk factors associated with LBP includes, physically demanding job, poor workplace social environment, inconsistency between job and education level, job dissatisfaction, and lack of co-worker support. Physical and psychosocial demands of work are an independent risk factors of LBP.

Author/ Date/Journal	Sample Size/Design/ Study population	Research Objectives	Results/ Claims
Garcia, Castro, Nunez, Pazos, Aguirre, Jreige, Delgado, Serpentegui, Bereguel, & Cantemir (2014) - Pain Physician	A systematic review of 28 studies in Latin America	To evaluate the prevalence of chronic non-specific low back pain among the Latin American population.	Four studies reported a prevalence of 4.2% to 10.1%, 20 found 31.3%, and epidemiological model estimated 10.5%. The risk factors are prolonged sitting, obesity and overweight, pregnancy, smoking, advanced age, lifting and carrying heavy loads, domestic work, sedentary lifestyles, and duration of current employment.
Bener, Verjee, Dafeeah, Falah, Al-Juhaishi, Schlogl, Sedeeq & Khan (2013) - Journal of Pain Research	N= 2 742 (cross-sectional) Back-patients in Qatar	To determine the prevalence, sociodemographic features with psychological distress.	The prevalence of LBP was 59.2%. Psychological distress such as anxiety, depression, and somatisation were more prevalent in LBP patients compared to patients without LBP.
Yang, Haldeman, Lu & Baker (2016) - Journal of Manipulative and Physiological Therapeutics	N= 13 924 National Health Interview Survey form US civilian populations	To estimate prevalence of LBP, to investigate links between LBP and a set of emerging workplace factors.	The three-month prevalence of LBP was 25.7%. LBP was linked to work-family imbalance, exposure to a hostile work environment, job insecurity, long work hours and certain occupation groups. These risk factors should be priories by employers, policymakers and HCPs who are concerned about the impact of LBP.
George , Childs, Teyhen, Wu, Wright, Dugan, & Robinson (2012) - PloSone	N=1 230 (assembled cohort) web-based surveillance system or phone among soldiers in USA	To identify demographic, socioeconomic, general health, and psychological domains that were predictive of occurrence, time, and severity of LBP.	Gender, smoking status and previous injury were predictors of disability. Gender, smoking status, physical health scores, and beliefs of back pain were predictors of psychological distress. It is a multifactorial origin and future preventative interventions will focus on multi-modal approaches that target modifiable risk factors specific to the population of interest.
Williams, Ng, Peltzer, Yawson, Biritwum, Maximova, Wu, Arokiasamy, Kowal, & Chatterji (2015) - PloSone	N = 30 146 Adults (≥50 years) participated in the WHO Study on global Ageing and adult health	To measure the prevalence, identify risk factors and determinants of LBP, and describe association with disability in six lower- and middle-income countries.	The prevalence was highest in the Russian Federation (56%) and lowest in China (22%). Female sex, lower education, lower wealth and multiple chronic morbidities were associated with LBP. Current evidence on LBP and its impact on disability is needed in developing countries to invest in a cost-effective education and rehabilitation programme.
Falavigna, Braga, Monteiro, Marcon, Castilhos, Bossardi & Conzatti (2015) - Spine	N = 1005 (cross-sectional) Caxias do Sul, a city located in southern Brazil	To assess the prevalence and the general characteristics LBP.	LBP is a highly prevalent condition in a middle-aged population. Higher levels of anxiety and female sex were related to LBP. Younger individuals are prone to LBP due to anxiety.
Rodrigues, Fernández, Martín, Blanco, Blanco, Moro & Alburquerque (2016) - PloSone	N= 22 Spanish and 26 Brazilian patients- qualitative phenomenology approach	To gain a deeper understanding of, and find explanations for, people's behaviour.	Most participants stated that no one was able to understand the pain they were experiencing. All Brazilian patients stated that religious belief affected the experience of pain. LBP can be determined based on the how a patient defines pain. Religion can be considered as a possible

Author/ Date/Journal	Sample Size/Design/ Study population	Research Objectives	Results/ Claims
			mechanism for patients to manage pain and as a form of solace.
Yilmaz & Dedeli (2012) - Health Science Journal	Narrative review of national and international literature	To evaluate role of psychosocial and physical risk factors in work-related LBP.	A number of researchers have been examined the evidence for psychosocial factors at work as risk factors for back pain in recent years. It is recommended to addressed psychosocial factors as physical factors for management of LBP.
Brady, Hussain, Brown, Heritier, Billah, Wang, Teede, Urquhart & Cicuttini (2016) - Medicine Journal	N= 9 688 (longitudinal study) Young women's in Australia	To identify whether modifiable risk factors, weight and physical activity are predictive of back pain in young adult women.	Inadequate physical activity and depression were independent predictors of back pain. Higher weight, inadequate levels of physical activity, and depression were all independent predictors of back pain over the following decade.
Hoy, Bain, Williams, March, Brooks, Blyth, Woolf & Buchbinder (2012) - Arthritis & Rheumatism	A systematic review of 165 studies from 54 countries.	To perform a systematic review of the prevalence of LBP and to examine the influence of case definition, prevalence period and other variables.	The prevalence was highest among female individuals and those aged 40–80 years. After adjusting for methodologic variation, the mean point-prevalence was estimated to be 11.9 ± 2.0%, and the 1-month prevalence was estimated to be 23.2 ± 2.9%. As the population ages, the global number of individuals with LBP is likely to increase.
Nascimento & Costa (2015) - Cad. Saúde Pública	A systematic review of 18 studies in Brazil	To describes the methodological quality of published studies on prevalence of LBP.	The one-year prevalence rate (>50%) was high in adults. The lack of precise epidemiological data hinders the development of preventative strategies.
Wong, Karppenen & Samartzis (2017) - Scoliosis and Spinal Disorders	A narrative review study among 320 studies	To summarise the causes and risk factors for the development of LBP among older adults.	Different factors play for the development of LBP. Factors like age, gender and ethnicity play significant impacts on the prognosis and management of LBP. Both clinician and researcher should focus on the most cost effective methods of personalised management for LBP.
Rodrigues, Peñas, Vallejo, Blanco, Gutiérrez & Sendín (2016) - Brazilian Journal of Physical Therapy	N= 60 (cross-sectional) Patients with LBP from the Brazilian and Spanish Public Health Services	To determine differences in pain perception between individuals with LBP living in Brazil and Spain.	The pain perception in patients with LBP is different depending on the country. Within Spanish patients, LBP is considered a more global entity affecting multidimensional contexts.

2.5 HIERARCHY OF EVIDENCE

The current review is limited somewhat by the scarcity of explicitly relevant literature that focuses on the exploration of the influence of cultural and social factors in vulnerability to LBP. Hence, it is essential to offer a preliminary discussion regarding each type of evidence presented as a basis for how different sources of identified literature were treated across the range of types of evidence. Importantly, the hierarchy of evidence is defined as:

> *"a process for making a decision about some epistemic property or relation which holds between the evidence provided by two or more studies, primarily based on a ranking of the design or methodology used in the studies".*

(Blunt 2015:24)

With reference to the hierarchy of evidence, there is acceptance that different methodological approaches offer different strengths and different levels of evidence. This difference must be appraised via a valid decision-making system to ensure scientific rigor. Universally, there is no agreed grading system for the appraisal of evidence. Gugiu and Gugiu (2010:234) discussed the grading levels of evidence and they confirm the existence of unsolved consensus with respect to the process of evaluating the strengths and limitations of different types of evidence. Even so, they conclude that random controlled trials rank above all other research methodologies and case studies, with expert opinion being seen as the lowest credibility evidence source. Cohort studies, case-controls, cross-sectional, and time series studies are seen as possessing moderate credibility.

The existing hierarchy of evidence classifies studies into random controlled trials and observational studies. In observational studies, a researcher is depicted as helplessly observing and recording the events of a study as they emerge without the ability to direct its course. The goal of an analytical cross-sectional study is to ascertain and identify the risk factors of LBP. Perfectly implemented analytical cross-sectional studies can be able to reach a conclusion based on a comparative analysis through simple systematic sampling and statistical matching techniques. Therefore, the hierarchy of evidence produced by this design is stronger than uncontrolled clinical trials in terms of hypothesis generation, developing questions for future clinical trials, and defining LBP.

To operationalise this process within the current literature review process, the level of the hierarchy was mainly guided by the extent to which each of the reviewed sources related to the research questions. In order to explore the modifiable risk factors of LBP and the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours, a range of primary and secondary sources of literature were used throughout the review process. The primary sources were placed higher on the evidence hierarchy because they provide a first-hand source of evidence. Due to this, original sources were considered to have a rigorous epistemological basis to the current knowledge. Primary sources included peer-reviewed journals, published books, monographs, magazines, original documents, official governmental reports, and newspapers.

Similarly, the use of the secondary sources such as literature reviews provided the snapshot of what is currently known about the study focus areas but from filtered data sources. (Trafford & Leshem 2008:81). The secondary sources included patient documents, systematic reviews, critically appraised topics, article synopses, and panel discussions from conference proceedings.

The secondary consideration in the hierarchy of evidence was related to the utilisation of a mixed method approach to the exploration of influence of cultural and social factors in vulnerability to LBP required both quantitative and qualitative reports to validate the reported information. Within this, there was greater credence given to studies that were multi-method and provided the researcher with opportunity to have a deeper understanding of the modifiable risk factors of LBP and the influence of cultural beliefs for the development of LBP to develop a culturally sensitive preventative model. In order to support a scientifically rigorous process with respect to the critical appraisal process for the current literature review, the hierarchy of evidence used gave greatest value to sources deemed to the strongest to the weakest, in order of strength and rank of evidence (Aveyard 2014:65). This order is summarised below:-

1. Systematic reviews and meta-analysis,
2. Randomised controlled Trials (RCTs),
3. Quasi-experimental designs,
4. Observational- analytical designs (cohort, case-control, analytic cross-sectional study),

5. Observational- descriptive studies (systematic review of descriptive studies, cross-sectional, case reports), and

6. Expert opinion and bench research.

Different scholars argue that this approach to determining level of evidence might not work for all types of literature. Due to this, the above-listed hierarchy of evidence has limited application for qualitative findings and for this reason, it was not utilised in assessing qualitative sources that gave the highest credibility to subjective feedback from participants (Aveyard 2014:66).

2.6 A REVIEW OF LITERATURE- CORE EMERGING THEMES

Thematic presentation of the findings extracted from the previous section of the literature review process helped to organise the information in a way that makes the writing process simpler and focused. The themes are identified based on the research questions discussed in chapter one. The next sections consist of a brief discussion of the following categorised considerations, the general descriptions and definitions of LBP, prevalence of LBP, risk factors of LBP, impacts of LBP, the influence of socio-cultural factors on the development of LBP and future research direction.

2.6.1 Overall situation of low back pain

Low back pain is the commonest musculoskeletal disorder affecting the majority of individuals within the community (Machado et al 2016:1446). Recent studies continue to confirm that it is a common disorder globally. It is estimated that about 80% of all populations will experience LBP at some period during their lifetime. Although, 18% of the population experience at one time each year, and 7% of them pursue consultation for their symptoms. The perception and reporting of LBP might be impacted inversely in different contexts by family structure, area of living, social expectation, social support, poverty, and availability of healthcare services (Williams et al 2015:2-3). Concerning the fundamental cultural, social, and economic variations between countries, it is reasonable to argue that the prevalence of LBP is not consistent. This is supported by a multi-country study which estimated that the one-year prevalence of LBP was 37.3% in developed countries and 41.1% in developing countries (Bener et al 2014:28).

Different epidemiological studies reveal that the prevalence of LBP is rising in Sub-Saharan African countries. A systematic review conducted among adults aged between 20-85 years reported a one-year prevalence of LBP between 40% and 72%. Whereas, estimates of LBP in Ghana and South Africa were 41% and 39% respectively (Williams et al 2015:12). Louw et al (2007:6) conducted a review to systematically evaluate the prevalence of LBP in the African continent and within this, they included twenty-seven eligible epidemiological sources which showed that, the mean point, one-year, and lifetime prevalence of LBP among adult population was estimated to be 32%, 50%, and 62% respectively. They concluded that the prevalence of LBP is rising in the African continent; - an observation that justified the concerns and recommendations in support of developing an effective preventive strategy and effective management options. Similarly, a lower prevalence rate of LBP was reported by two epidemiological studies conducted in Ethiopia which showed a 21.7% prevalence in urban dwellers and a 16.7% in rural dwellers (El-Sayed et al 2010:90).

The literary contributions regarding its definition, classification, and diagnosis are fraught with uncertainties (Bath et al 2014:1961). Some authors define LBP as "*sensations or discomfort in the back*" and some other define it as "*painful events in the lumbosacral and sacroiliac region*" (Falavigna et al 2015:359). A preferred operational definition of LBP is that it can be seen as "pain or discomfort in the lumbar spine, localised between the lower margins of the 12th ribs and above the gluteal folds at least one episode for the past one-year, with or without radicular pain" (Yilmaz & Dedeli 2012:597 & Hoy et al 2012:1). Although most scholars classify LBP based on the duration, with acute LBP typically lasting 6 weeks, subacute mostly lasting 6-12 weeks and chronic persisting for more than twelve weeks without any cure. Some other authors classified it based on the aetiology as specific, caused by a known pathophysiological mechanism and non-specific LBP which develops without any known causative agents (Zungu & Nigatu 2015:15). There is no documented gold standard diagnostic entity yet (Bath et al 2014:1962) and physicians use different terms to diagnose it such as lumbago, backache, and lumbar spondylosis.

Due to these uncertainties, it has remained the biggest challenge for the society in terms of disease burden, disability, healthcare utilisation, and treatment costs (George et al 2012:3; Machado et al 2016:1446 & Zungu & Nigatu 2015:15). It is recognised as a dynamic, fluctuating, and complex syndrome with a complex pathogenetic pathway. Additionally, it has

a high rate of incidence, recurrence, and recovery (Melaku, Haimanot & Shiferaw 2012:45). It is the second most common cause of work absenteeism in the working community next to the common cold. In Ethiopia, it is placed second by years lived with disability next to iron deficiency anaemia and third by disability-adjusted life years next to stroke and depressive disorders (Williams et al 2015:2).

Over the progression of time, the average life expectancy rates have been identified as improving within the developing world (Yilmaz & Dedeli 2012:598 & Williams et al 2015:3). Even so, challenges of adding quality to life continue to pose serious problems. Within this, LBP has become an increasingly striking health problem primarily, because of its high prevalence among working adults and secondly, of its largely incurable nature and the poor prognoses associated with it. Here, it is essential to prevent the development of LBP by using cost effective and efficient strategies Even so, there is no study done to support the development of a culturally sensitive preventative model, which is a much needed method in the area of disability prevention within Ethiopia.

2.6.2 The prevalence of low back pain

Low back pain represents a major public health problem throughout the world. It affects a majority of the adult population and interferes with work and recreational activities (Bener et al. 2014:228; Falavigna et al 2015:359 & Hoy et al 2012:1). Despite agreement that LBP represents a devastating health problem, its reported prevalence was uncertain with inconsistencies from country to country (Yilmaz & Dedeli 2012:598). This is explained by the intercultural differences between peoples in pain perception or pain reporting, and the variations of the definition used by the researchers (Bath et al 2014:1962 & Bener et al 2014:228).

Hoy et al (2012:1) conducted a systematic review to examine the influence of case definition, prevalence period, and other variables on the prevalence rate. Details of selection criteria, search strategy, data extraction strategy, data management, and data presentation were explained well. The review process involved 165 peer-reviewed studies from 54 countries. Their findings revealed that LBP was a major problem throughout the world. Highest prevalence was documented among females than males aged between 40-80 years. The

mean point-prevalence was estimated to be 12%, the one-month prevalence was 24%, and the life-time prevalence was 38.9%.

The prevalence of LBP in Europe varies from 74.8% in Finland and the Czech Republic (64.2%), and lower in Netherlands (7.5%). Similarly, it was reported among the general population in Denmark as 56%, in Sweden 39.2%, in the UK 36.1%, and in Italy 32% (Bener et al 2014:230). On the other hand, lower prevalence of LBP was reported among Canadian, US, and Australian populations. The prevalence of LBP in the Canadian population was estimated to be 28.7%. Whereas, the prevalence of LBP was reported in the cross-sectional national health survey in the US general population as 25.7% (Yang et al. 2016:459). Comparative to this, a lower prevalence of LBP in the general Australian population was estimated to be 25%. It has been noted that some of the differences in prevalence rates are mainly due to the variations in the selection of study subjects, the methodologies followed by the researchers, and the measuring tools used by each study.

Garcia et al (2014:379) conducted a systematic review to evaluate the prevalence of chronic non-specific LBP among the Latin American population. The study offers a well-articulated definition of LBP, inclusion and exclusion criteria, data search strategy, quality assessment, synthesis and expert panel. The inclusion criteria were crossover trials, systematic reviews or meta-analyses, published journals within population groups of Latin America. The exclusion criteria specifically identified studies conducted before August 2002 and LBP with infectious or post-traumatic or suspected malignancy. The narrative synthesis of 28 studies with a total of 20 559 study subjects from 7 countries. The result was validated by a panel of clinical experts on pain and from this, the estimated prevalence of LBP varied between 1.8% and 11.3%.

Nascimento and Costa (2015:1) conducted a systematic review to estimate the prevalence of LBP in Brazil. The study clearly elaborated eligibility criteria, data search strategy, and data extraction processes. They identified 263 literature sources and included 18 studies for synthesis with a study population of 19 387 with varying samples from 56 to 3 269. The review showed that the one-year prevalence of LBP was high (>50%) in adults and 4.2% to 14.7% in the general population. They summarised that due to the high risk of bias of the eligible studies, the rates might not represent the actual prevalence of LBP in Brazil. The

lack of accurate epidemiological data hinders the development of preventive strategies and appropriate intervention action plans.

Despite these similarities between studies, there is acceptance too, that the prevalence of LBP can be erratic from country to country globally. It was estimated to be 63% in Bangladesh, 59% in Israel, 57% in Iran and Qatar (Arunsawas et al 2017:152; Bener et al 2014:227 & Khan et al 2014:50). Similarly, a cross-sectional study conducted among 30 146 participants in six low- and middle-income countries estimated prevalence of 56% in the Russian Federation, 41% in Ghana, 39% in India and South Africa, 36% in Mexico, and 22% in China (Williams et al 2015:2-3).

The annual prevalence of LBP in the developing countries was 30-68% among urban inhabitants and 7-18% among rural inhabitants (Bener et al 2014:28). In Africa, epidemiological studies have reported the prevalence of LBP in different study subjects. A community-based cross-sectional study done among 485 rural farmers in Nigeria showed a point-prevalence of LBP as 67.1%. Importantly, lower prevalence of LBP was reported in urban Nigerian and estimated to be 46.8% (Ogunbode et al 2013:1). A similar study conducted among adult rural South Africans estimated prevalence at 42.9% and on the other hand, the prevalence of LBP in Mulago Hospital, Uganda was 20% (Yilmaz & Dedeli 2012:599).

Many researchers have been described that the prevalence was higher in occupational settings (Ogunbode et al 2013:1-8). This is supported by Yiengprugsawan et al (2017:1) who indicated it is the commonest musculoskeletal complaint in occupational settings. It was estimated that the prevalence of LBP was 41% among Shanghai textile factory workers and 34% in rural Tibetan farmers. Other studies done in Addis Ababa among taxi drivers, aircraft technicians, and Nurses, showed the occurrence of LBP to be 64%, 47%, and 46%, respectively (Belay et al 2016:113 & Zungu & Nigatu 2015:18).

2.6.3 The risk factors of low back pain

Low back pain has reached epidemic proportions with several factors contributing to its development (Brady et al 2016:3 & Hoy et al 2012:2028). There is a lack of consensus about the root causes and the association between LBP and spinal imaging (Brady et al 2016:3). The relationship between tissue insult, injury, and pain continue to be the subject of

investigation (Bener et al 2014:228 & Falavigna et al 2015:359). The causation of LBP appears to have a complex origin and is often taken as originating from genetic and environmental factors.

The environment in which people live and work is now broadly understood to be related to LBP development. Taking into account the context in which sufferers live in, rural and urban areas have their unique cultures and pain experiences (Brady et al 2016:3). The people living in rural areas were more likely to experience LBP than those living in urban areas. This is reinforced by a health survey conducted in Canada by Bath et al (2014:1961) which, identified that people who living in more rural and geographically remote areas have a greater risk of reporting LBP. This might be due to the fact that, people living in rural areas are more frequently exposed to strenuous outdoor household activities like manual labour and carrying water and food supplies (Williams et al 2015:12).

Shemory et al (2015:413) conducted a cohort study to identify modifiable risk factors and determine the relative risk factor of LBP among 26 435 080 participants in a pooled electronic healthcare database across USA. According to the available medical history data, 1.2 million patients had a diagnosis of LBP (4.54%). The incidence of LBP increased with a history of nicotine dependence, obesity, depressive disorders, and alcohol abuse.

The study did not depict the strength of the finding. But the strength can be concluded form the large sample size and the fact that this was a cohort study. By contrast, the study's findings may be limited by accuracy concerns and challenges with the completeness of electronic database which may have not correctly screened for all back patients.

Wong, Karppinen and Samartzis (2017:3-5) conducted a narrative review to summarise the causes and risk factors of LBP among older adults. The review identified 2 182 previous data sources and within their review, they included 320 articles. They classified the causative agents in terms of modifiable and non-modifiable risk factors. The modifiable risk factors included accidental falls, smoking, inactivity, physical activity, anxiety, depression, social environment, self-perceived health, and co-morbidity. Notably, the stated non-modifiable risk factors were age, gender, genetics, marital status, low education, low income, dementia and prior work exposure.

Overall analysis of the different data sources shows that the categorisation of risk factors was primarily either in terms of whether factors were modifiable or non-modifiable and in some instances, researchers would use different resik factors, such as socio-demographic, lifestyle, work-related and psychosocial factors (Bath et al 2014:1964; Williams et al 2015:2 & Yilmaz & Dedeli 2012:598). Through the combined use of these two inter-related categories of risk factors, the researcher expected to develop a culturally sensitive preventative model by exploring the influence of cultural and social factors in vulnerability to LBP. In the next section, these categories of risk factors will be elaborated in detail.

2.6.3.1 Socio-demographic factors

Many researchers have shown that the development of LBP is associated with socio-demographic factors such as age, sex, marital status, ethnicity, and educational level (Bener et al 2014:233 & Hoy et al 2012:2034). This is reinforced by a systematic review conducted in Turkey which concluded that age, sex, educational level, and condition of general health might contribute to the incidence of LBP (Yilmaz & Dedeli 2012:598). In agreement with this, a study by Williams et al (2015:2) in six LIMCs countries and Bath et al (2014:1961) in a Canadian rural community identified that gender i.e. being female, married, indigenous ethnicity, lower educational level, lower economic income, and multiple chronic morbidities were significantly associated with the occurrence of LBP. This is further aggravated by non-functional healthcare services, higher levels of personal risks, and more hazardous environmental, occupational, and transportation conditions.

Low back pain might occur more commonly among older adults and females. This is supported by various scholars whose work suggests that older people and females were found to experience more persistent and sever forms of LBP compared to young adults and males (Bener et al 2014:233; Ogunbode et al 2013:8; Williams et al 2015:12 & Yang et al 2016:459). Previous research indicated that LBP prevalence gradually increases from adolescence to the age of 65 years and then decreases, which might be due to work-related exposure among adult populations or age-related changes in pain perception or stoicism in older aged individuals (Ogunbode et al 2013:1-8). This is worsened by having a cognitive impairment, depression, decreased pain perception, and increased tolerance to pain might reduce the incidence of LBP in the later life. Even so, a study done by Hoy et al (2012)

indicates that the absolute number of people with LBP is likely to increase substantially over the coming decades due to increasing life expectancy in different parts of the world.

Numerous authors present findings that suggest that females are more prone to LBP related to osteoporosis, osteoarthritis, menstruation, pregnancy, and somatic symptoms (Bener et al 2014:233; Falavigna et al 2015:359; George et al 2012:3 & Hoy et al 2012:2034). Likewise, a study done by Ogunbode et al (2013:1-8) identified that dysmenorrhea, history of previous back injury, and occupation was associated with the exacerbation of LBP. In the same way, genetic makeup, sex hormones, and pain coping mechanisms might interact and contribute to the incidence of LBP. This might be due to that females have greater perception and reporting of pain and have genderised dissimilarities in response to analgesics. On the contrary to this point of view, a study conducted among aircraft technicians in Ethiopia airport summarised that gender differences in the prevalence of LBP in workers were not consistent (Zungu & Nigatu 2015:23).

It has been stated that LBP is more prevalent in the lower educational and socio-economic communities. This is supported by a study done in Qatar by Bener and his colleagues (2014:234) who stated that, LBP is more likely to be reported by those with lower educational qualifications and economic index. This is supported by a cross-sectional study conducted in Nigeria, which specified that economic status was very low in the studied LBP patients with a monthly income. This confirms that people with lower educational and income status might have restricted resources that delay pursuing healthcare to address their symptoms until they transformed into chronicity levels. Importantly, higher educational and economic status could provide better understanding of pain, a better compliance to management, and a strong interest to adopt a healthy lifestyle (Wong et al 2017:7).

Bener, Dafeeah and Alnabi (2014:227) conducted a cross-sectional study (in Qatar) to determine the prevalence and socio-demographic, lifestyle factors and impacts of LBP in a rapidly developing country. The study involves 2 600 patients from the primary care settings in which 52% were female and 48% were males. The study reported that a prevalence rate of 56.5% for LBP. It was more prevalent among women (53.9%) compared to men (46.1%). There was a significant difference between male and female patients of LBP in terms of sex, ethnicity, marital status and monthly household income. The percentages of different aspects of functional disabilities were higher among females compared to male patients with LBP.

Almost a quarter of female patients with LBP (26%) and 18% male patients with LBP reported pain in the arms and legs. In addition, gastrointestinal complaints such as abdominal pain, food intolerance, headache and fainting were higher among female patients as compared to male LBP patients.

The study has its own strengths such as: a representative sample and adopting standardised questionnaires for data collection. The limitations of the study were patient's self-reports on current episodes of LBP may not be accurately represented, elderly patients were intentionally excluded, and the dataset probably did not distinguish accurately between incident and prevalent cases.

Williams et al (2015:1) conducted a cross-sectional study by using a standardised national survey to measure the prevalence of back pain, to identify and determine associated risk factors, and to determine relationship between LBP and disability in adults aged 50 years and older in six LIMICs from different regions of the world. The study contains a weighted sample of 30 146 residents from China, Ghana, India, Mexico, South Africa and the Russian federation. Data was collected via in-person structured interviews from 2007-2010. The prevalence was highest in Russian Federation (56%) and lowest in China (22%). The associated risk factors included being female, lower educational level, lower wealth, and multiple chronic morbidities. About 8% of the respondents reported that they had experienced severe LBP in the previous month.

The study has its particular strengths and limitations. Its strength could be the adjusted effect of cultural differences, the nationally representative survey in six LIMICs, and the use of culturally differentiated questionnaires. In contrast, the limitations include a cross-sectional nature of the study presents a weak relationship between risk factors and occurrences of LBP. Furthermore, the study does not separate antecedent factors from incident cases from consequent factors associated with the prevalent cases, and some determinants might be wrongly identified consequences.

In summary, the researcher has publicised that the incidence of LBP is associated with socio-demographic factors such as age, sex, marital status, ethnicity, educational level, and income status. Although, area of living, multiple chronic morbidities, type of living house, and previous history of LBP are additional factors to promote the frequency of LBP. But higher

educational level and economic status could provide knowledge or resources that reduce the incidence of LBP. These risk factors are varying with different circumstances, like: the study population, case definition, methodology, study context, socio-economic status, and so forth. Therefore, continuously dealing with these deteriorative and preventive factors may provide consistent evidence to prevent the incidence of LBP.

2.6.3.2 Lifestyle factors

Next to socio-demographic factors, lifestyle factors have a great influence on the development of LBP. A systematic review conducted in Turkey summarised that Body Mass Index (BMI), and smoking were predictors for the development of LBP. Likewise, the risk factors reported by Garcia et al (2014:379) were obesity, pregnancy, smoking, domestic work and sedentary lifestyles. Similarly, eating behaviours, drinking alcohol, smoking, and other coping styles like internal regulatory and external auxiliary mechanisms were also found to have an impact on the incidence of LBP (Yilmaz & Dedeli 2012:598). Previously consuming little alcohol was believed to have a protective effect on the frequency of LBP. But a recent study done by Suri et al (2017:11) concluded that there is no protective effect by consuming a little alcohol anymore.

Suri et al (2017:4) conducted a cross-sectional co-twin control study to examine the association of modifiable lifestyle and psychological factors with life-time LBP in a nationwide sample in the Vietnam Era Twin Registry. The study involved 7 108 respondents from a nationwide sample of male twin with a mean age of 62 years. The study elaborated on the study participants, assessment criteria, psychological factors, analysis of potential cofounders, and statistical analysis and interpretation. The lifestyle factors included were BMI, smoking, alcohol consumption, physical activity, and sleeping duration and the confounders listed were age, race, education, and income. The individual level analysis investigated all mentioned factors were associated with the development of LBP. Whereas, obesity were the associated factors in both individual and within-pair analyses.

The study presented its strengths and limitations. The strength of the study emanates from the fact it used a unique and powerful epidemiological model to isolate the association between risk factors and outcome variables by controlling familiar confounders, and it was the first co-twin control study in the USA. The limitation of the study arose from its reliance

on a cross-sectional design and that, even though the risk factors of LBP were under study, the definition of LBP used was not specified. The study did not specifically notify the exact location, and generalisation is impossible to the general population due to sample comprised only of older military veterans.

Ogunbode et al (2013:1) conducted a cross-sectional survey to determine the prevalence and associated risk factors of LBP in Nigeria. The study involved 485 adult patients attending the general outpatient clinics with 59.4% female and 40.6% male respondents. The study revealed that obesity, previous back injury and tobacco smoking were associated factors for the total population. While, for the female respondents, a waist circumference of 88 cm or more, dysmenorrhea, previous back injury and being involved in hazardous activities were the predictors for the developing of LBP. However, previous back injury was the only risk factor associated with LBP for male respondents.

The study did not describe the strengths and limitations of the study by itself. However, the study has the following strengths and limitations: a well elaborated study context and the fact that it used a representative sample size could be considered as strengths. The fact that individuals with back pain secondary to congenital deformity or, those who were too ill to participate were excluded intentionally, and the imprecise sampling technique, could all be considered as limitations.

Compatibly, a study done in Canada by Bath et al (2014:1961) identified that smokers and obese peoples were prone to LBP. This was supported by Brady et al (2016:1) and Bener, Dafeeah and Alnabi (2014:233) who reported that obesity was an important predictor for the development of LBP in the general population. Comparatively in the military inception cohort study; active duty, previous injury, and higher BMI were increased the risk of development of LBP (George et al 2012:3). A statement by Brady et al (2016:1) presented a statement as over the next 12 years, the weight of individuals will be increased by 5% and this promote the risk of LBP will also increase.

Smoking cigarette is a contributing factor for the development of LBP. This is supported by Ogunbode, Adebusoye and Alonge (2013:1) and by Bener, Dafeeah and Alnabi (2014:234) who revealed that smoking cigarettes increased risk of LBP. Similarly, a community-based health survey study by Bath et al (2014:1966) has shown that smoking is linked to the

incidence of LBP even after adjustment of socio-demographic and health factors. They found that the prevalence of LBP was higher amongst the current and ex-smoker groups than non-smokers. Notably, Suri et al (2017:11) failed to confirm any association regarding to the link between LBP and smoking cigarette. This difference might be due to the variations in the methodology, case definition, and study population they used.

Various types of physical exercise have a potential effect to protect individuals from LBP. But, numerous RCTs have been identified that doing any type of physical activities could prevent LBP only for less than a year. Wand and his colleagues (2014:815) conducted a case control study to assess the advantage of health education over moderate and vigorous exercise alone among back patients in Shanghai, China. A randomised study of 25 health educators and 24 control group counterparts, all aged 18-30 years, found that health education provides benefits to exercise alone for improving pain, disability, mental and physical health related to quality of life.

The study did not present strengths by virtue of its findings, however being a case control study could be seen as a strength. Interestingly, the study presented its limitations as the that the findings could not applied across all age groups because of the small sample size, patients and the physical therapists were not blinded.

On the contrary, there is a huge conflict of conclusions emerged with respect to whether physical activity increases or decreases the development of LBP. This is due to the presence of undifferentiated effects of exercise from leisure-time activities. Beside these assumptions, exercise programmes should be distinguished from recreational or leisure-time activities. Thus, separation of physical activity programmes from domestic or recreational activities, or from other type of events is critical to appreciate the benefits or risks of attending any exercise programme (Suri et al 2017:12).

Physical activity might also have a role in the occurrence of LBP, but to-date, prospective studies examining its relationship have yielded inconsistent results (Brady et al 2016:1). There was a higher rate of LBP reported amongst those with higher levels of physical activity compared with moderate or lower levels of physical activity. This indicated that individuals with higher levels of sport activities might prone to traumatic type of LBP. However, these results were not consistent and the association between LBP and physical activity can occur

in both directions (Suri et al 2017:12 & Williams et al 2015:14). Although, inadequate physical activity were independent predictors of LBP occurrence (Brady et al 2016:1). Physical inactivity and those who were engaged in less than 30 minutes of exercise were prone to LBP (Ogunbode et al 2013:5).

Some authors have been revealed that sleeping materials have association with the development of LBP. Additionally, patients with chronic and non-specific LBP, their pain and disability improved after using a medium firm mattress. But a study by Ogunbode, Adebusoye and Alonge (2013:7) failed to get any association between type of sleeping material and development of LBP.

Bener, Dafeeah and Alnabi (2014:234) elaborated that chronic medical diseases such as joint pain, pre-existing LBP, hypertension, diabetes mellitus, and loneliness were predictors for the incidence of persistent type of LBP. Another study revealed that chronic co-morbidities were positively associated to at least one episode of LBP and akternatively, chronic LBP can lead to incidence of comorbidities. Explicitly, the odds of LBP were 2.7 times higher among older adults with one comorbid condition compared to adults without chronic medical illnesses, while the odds ratio was 4.8 for people with two or more deconditioning syndromes (Wong et al 2017:12). This might be due to the mechanical and metabolic factors increases disc degenerations and linked directly or indirectly to the occurrence of LBP.

In general, lifestyle factors such as higher BMI, cigarette smoking, occupation, home-made activities and other sedentary lifestyle contribute for the development of LBP. Whereas, physical activity, sleeping materials, drinking alcohol, sleeping duration, and deconditioning syndromes might directly or indirectly interact to other variables to cause LBP. But some researchers failed to promote the association between these variables with LBP occurrence. The modifiable lifestyle factors are sedentary lifestyle, obesity, drinking alcohol, smoking, poor exercise habit, sleeping material, and drug dependence (Ogunbode et al). If these factors are aggravated by work-related factors, incidence of LBP might be increased.

Next, work-related risk factors that emerged from the thematic synthesis will be elaborated on in detail.

2.6.3.3 Work-related factors

Low back pain is the most prevalent musculoskeletal disorder in working communities. Healthcare providers expect that employed populations might experience LBP more than their unemployed counterparts due to a number of reasons. This might be due to the nature of the occupation and many authors have documented that various types of occupations can be vulnerability to LBP (Sinha AP 2017:933; Yang et al 2016:459 & Yilmaz & Dedeli 2012:608). The commonest occupational groups that were exposed to LBP included construction workers, daily labourers, mechanics, healthcare practitioners, bankers, and farmers (Yang et al 2016:459). The study concluded that heavy physical work, night shifts, heavy or frequent manual operations, lifting heavy loads, repetitive trunk rotations, awkward postures, bending, twisting, pulling, pushing, whole body vibration, weakness in the leg, prolonged sitting and standing were the major work-related risk factors for the development of LBP (Bener et al 2014:234; Falavigna et al 2015:359 & Garcia et al 2014:379).

Yilmaz and Dedeli (2012:598) conducted a narrative review to evaluate both research and review studies in a national and international literatures for the role of physical factors for the work-related LBP. They found that various physical factors and mechanical impacts were associated with the exacerbation of LBP. On the same note, heavy physical work, frequent manual operations, repeated rotation of one's body-trunk, whole body vibration, and prolonged sitting were linked to the occurrence of LBP. However, the causal and independent contribution of the working environment on the incidence of LBP is still disputed.

The study's strengths included the fact that, the researchers systematically reviewed national and international literature, they used a standardised definition for LBP, and also, they clearly stated the physical risk factors for LBP. The limitations that were considered included issues such as missing socio-demographic and lifestyle factors, unmentioned reviewing processes, selection bias to investigate the risk factors, and they used a conceptual framework which did not include socio-demographic, lifestyle and other important factors which have been recognised as significant to the development of LBP.

Similarly, Zungu and Nigatu (2015:18) conducted a cross-sectional survey to determine the prevalence and risk factors of LBP among aircraft technicians in Ethiopian Airlines. A self-administered questionnaire was used to collect quantifiable information. The physical

workplace factors included lifting, pulling, carrying, and pushing of heavy loads and twisting and bending position,s were significantly associated with the development of LBP.

This is supported through research done by Ogunbode, Adebusoye and Alonge (2013:1-8) and Yang et al (2016:459) who showed that different types of occupational activities are risk factors for LBP. They found that work-family imbalance, exposure to hostile work environment, job insecurity, long work hours, and certain occupational groups have a predictive value for the occurrence of LBP by controlling for demographic and other health-related risks. In the same way, unavailability of light duties and lifting of heavy loads were linked to the chronicity of LBP (Yilmaz & Dedeli 2012:608).

On the other hand, Kerr et al (2001:1069) conducted a case-control study to determine the physical demands of work among 137 case subjects and control subjects of automobile manufacturing workers. Data was collected through an in-home interviewer assisted questionnaire. Identified self-reported risk factors were a physically demanding job, poor workplace environment, unmatched job, depraved job satisfaction, low co-worker support, and little job control. Additionally, the physical risk factors included peak lumbar shear force, peak load handled, and cumulative lumbar disc compression. But being under weight and prior compensation claims were the two most important predictors of LBP development.

The study acknowledges its own strengths and limitations. The strengths of the study included its adequate statistical power and that it was a case-control study. By contrast, the limitations were selection bias, recall bias, and the fact that study did not include socio-demographic and lifestyle factors.

Machado et al (2016:1445) conducted a case-crossover study to investigate the association between transient exposures to physical activities with the development of persistent and non-persistent LBP. The study included 999 consecutive participants seeking care for sudden onset of LBP in New South Wales, Australia. From the participants, 832 completed the 12-month follow-up successfully. Of these, 430 participants had non-persistent LBP that lasted less than six weeks' duration and 352 reported persistent symptoms that lasted six or more weeks. The findings showed that that exposure to manually operating tasks like heavy loads, awkward postures, live with animals, moderate or vigorous physical activity, and being fatigued during a task or activity increased the risk of LBP.

A key strength of the study was its ability to include 83% of the original participants, low risk of bias achieved by using a case-cross over design, chance of bias due to confounding was reduced, and further statistical adjustments were not needed. Acknowledged limitations of the study included potential recall bias, type of treatment participants received could have affected recovery, no data were collected on the types of treatment or referrals, limited number of participants with persistent LBP, and researchers identified that they were unable to collected data on the exposure to preselected triggers.

In summary, work-related risk factors were found to be the major contributor causes for the development of LBP in the working community. Among them, occupation which needed individuals to deviate from the normal anatomic posture, sitting for more than thirty minutes, standing for more than an hour, carrying greater than 10kg weight, unsafe working environments, could lead to LBP. These risk factors can be grouped into modifiable (mutable) risk factors which included poor posturing, twisting, bending, stooping, lifting heavy loads, prolonged standing and awkward posture and non-modifiable (immutable) risk factors which included occupation (Williams et al 2015:1). Almost all factors are amenable if appropriate measures could be implemented. If these factors are aggravated by psychosocial risk factors, the LBP could progress to persistent and chronic types of pain. Next, psychosocial risk factors that emerged from the thematic synthesis will be elaborated in detail.

2.6.3.4 Psychosocial factors

In addition to work-related factors, psychosocial factors played a significant role for the development of LBP. The identified factors were high level of anxiety, depression, stress, mood, emotion, decision latitude, psychological distress, cognitive functioning, pain behaviour, and depressive disorder. These dynamics had directly or indirectly interacted with each other and with other factors to escalate the incidence of LBP (Falavigna et al 2015:359; Hoy et al 2012:1 & Yilmaz & Dedeli 2012:598). The above-mentioned authors stated the association between bio-mechanical and psychosocial factors for the development of LBP. They specified that, high bio-mechanical demands and poor psychosocial factors add up a greater effect on the risk of LBP. However, distress, depressive mood, somatisation, long duration of pain, and fear-avoidance behaviour were linked to the chronicity of LBP.

The same study revealed that time pressure, low control on the mood, lack of social support, and stress symptoms were related to the development of LBP. However, the causal and independent contribution of the psychosocial factors on the incidence of LBP was seen as still unsolved with limited consensus within the scientific community. Moreover, Post-Traumatic Stress Disorder (PTSD) and depression were strongly associated with the development of LBP even after controlling for genetic factors. This is supported by a study done among young adult women in Australia by Brady et al (2016). They indicate that depression was an independent predictor of LBP after adjusting for age, weight, height, and educational status and leads to poor outcomes in the management of LBP.

El-Sayed et al (2010:684) conducted a cohort study in Gilgel Gibe Growth and Development area in Jimma, Ethiopia. The main aim of the study was to evaluate the prevalence and the relationship between anxiety, depression, and pest-traumatic stress syndrome on the occurrence of LBP among rural communities. The study involved a random sample of 550 households and used questionnaires and anthropometric measurements to collect data. Surprisingly, the majority (61.8%) of the study subjects were between 20-29 years of age. Nearly half of them owned 47.3% of assets, which was below the median number of household assets. They found that anxiety was the most leading psychopathology at 42%, followed by depression by 36%, and then post-traumatic stress disorder at 10%. They concluded that female gender, low asset holdings, depression, and anxiety were associated with higher LBP risk.

The study clarifies its importance for the clinicians and researchers and the limitations that they had in conducting the study. The strengths included the fact that the study exposed common psychopathologies which acted as causes of LBP within developing rural settings. Notably, the prevalence and psychopathologic relationship of LBP in rural underdeveloped settings was found to be identical with other settings. Similarly, psychopathologic symptoms were connected with LBP in sub-Saharan Africa, and the study concluded that future researchers should consider comparative studies between urban and rural contexts in developing countries. Importantly, the limitations that were alluded to, included that fact that the study used instruments that were not validated for use on the study population; the findings could not be generalised to other settings; confounders were not included, and the

cross-sectional nature of the study did not allow for the accurate drawing of inferences between covariates and outcome variables.

Bener et al (2013:95) conducted a study to determine the prevalence and psychological distresses such as anxiety, depression, and somatisation with LBP. The study was done among 2 742 patients attending primary healthcare in Qatar. The researchers used a self-administered questionnaire to gather information. The study consisted of 52.9% males and 47.1% females. The prevalence rate was 59.2%, separated out as 46.1% in men and 53.9% in women. The findings showed that somatisation (14.9%) was detected more in back patients, followed by depression (13.7%) and anxiety disorders (9.5%). The most regularly described symptoms among somatised back patients were headache (41.1%) and joint pain in arms and legs (38.5%). The most frequent symptoms among back patients were, suicidal and self-harm ideation (51.4%) and depression (49.2%). The most common types of anxiety symptoms were "over-worrying" (40.2%), "worrying about belongings" (40.2%), and feeling frightened (40.2%). Generally, psychological distress like anxiety, depression, and somatisation were considerably more complex syndromes among back patients in the United Arab Emirates.

The strengths and limitations of the study were not specified by the aforementioned. However, the study had the following limitations i.e. the study had a small response rate (80%), and intentionally excluded elderly individuals, and it compared only urban and semi-urban areas, and the lack of representativeness of the sample could be considered as limitations.

Chidobe et al (2017:779) conducted qualitative in-depth interviews among 30 participants in rural Nigeria to explore the experiences of people living with LBP. The thematic analysis showed that back pain development was believed to be related to manual labour, infection, degeneration, spiritual, cultural beliefs and the effects of the rural-urban divide. These beliefs resulted on gender roles in adaptive or maladaptive coping strategies. Positive coping mechanisms were facilitated by not seeing LBP as an illness and maladaptive mechanisms were stimulated by viewing LBP as an illness. Spirituality was associated with both adaptive and maladaptive coping. Chronic-LBP-related disability in rural Nigeria was strongly influenced by beliefs that facilitated coping strategies that either enhanced or inhibited recovery.

Strengths of this research were the rigorous systematic data collection and analysis, detailed description of the methods and the orientation of the researcher, reflexivity and respondent validations, as well as the findings being substantiated by a multidisciplinary team. The limitation of this study was that participants were not representative of multicultural Nigeria; therefore, more studies should be conducted to explore meanings in other African contexts.

On the contrary to the above described studies, a cluster randomised control trial was done by George et al (2012:1) to investigate the effectiveness of exercise and psychological education programmes among soldiers. These education programmes incorporated the use of a back book on the educational programme and encouraged active coping mechanisms to respond to prevent LBP. After two years of the programme, 48.6% of the soldiers developed a first-episode of LBP and failed to prevent LBP. They stated that psychological factors were not predictor factors for the development of LBP during their military service. Notably, military personnel with better mental and physical health scores were have a protective factor from LBP. The commonest mentioned psychosocial risk factors are psychological distresses, emotional expressions, depression, social support from families, friends and co-workers, and overall situation of the living and working environment. If appropriate measures did not take to prevent exposures into these factors, they further aggravate the condition and promote to progress into more sever, persistent and chronic type of LBP.

2.6.3.5 The influence of socio-cultural factors on low back pain

Socio-cultural factors play significant roles in the occurrence, perception and persistence of LBP. Perception of pain is a complex phenomenon influenced by social and cultural factors. In recent years, researchers have become highly interested in the effects of cultural factors, since these factors have acquired greater importance in chronic pain due to the emergence of the biopsychosocial model. It seems that social, cultural, and environmental factors play a significant role for the development of LBP.

Culture is a collection of learned behaviours, beliefs and attitudes towards the modifiable risk factors and ergonomic practices that are characteristic of back patients (Singh, Newton, O'Sullivan, Soundy & Heneghan 2018:1). An individuals' culture determines the perception and experience of LBP. It shapes perceptions and cognitions of the person with respect to

the environment and their coping mechanisms in living with pain. Even so, LBP is an individual experience and its occurrence is influenced by individual socio-cultural risk factors. It is these factors that influence the decision to take up health promoting behaviours or to persist within health jeopardising behaviours.

There are different ways of expressing pain. There are non-verbal and verbal expressions of pain to families, friends or healthcare professions. Each and every cultural and social groups have their own complex jargons by which diseased individuals make other healthier people responsive of their suffering. This depends on whether individuals live within cultures which promote the free expression of pain with words, emotional displays or postural mobility (Peacock & Patel 2008:6). Some other cultures disallow sufferers from explaining or expressing their pain to their relatives or friends. Instead they promote the covering up of their emotions.

In some part of our globe, LBP is seen as a normal part of daily life and it may be accepted that this disorder does not require clinical solutions. Based on this, Honeyman and Jacobs (1996) stated that Australian aborigine communities did not perceive LBP as a health problem and accordingly did not report symptoms unless they asked and displayed emotions related their pain to medical services. In this case, it seems that the symptoms of LBP were not deemed to be a medical problem. Therefore, back patients were more likely to be under-treated for their pain from health posts, health centres, district hospitals, regional referral hospitals and private healthcare facilities.

It is likely that these differences in pain management are a product of stereotyped perceptions of ethnicity, language barriers, socio-economic status, healthcare provider-patient communication and clinical evaluation of pain. LBP is a universally recognised disorder and the commonest musculoskeletal illness-reason for seeking healthcare. It is more than a biological response to painful stimulus and includes behavioural components as influenced by cultural beliefs and attitudes. It is a biopsychosocial phenomenon where its definition, expression and management are culturally determined (Henschke, Lorenz, Pokora, Michaleff, Quartey & Oliveira 2017:1). Its behavioural and psychological management is also developed primarily from the western world. Therefore, the need for culturally grounded prevention and treatment methods for LBP is evident.

The researcher conducted this study at a hospital setting where individuals shared their pain and made it public. Because LBP is a private experience and in order to recognise individuals experiencing it, researchers found that it must become public through verbal communications. Back patients and healthcare professionals bring their own cultural attitudes to the communication and interpretation of the patient's pain experience. The proverb "LBP is what the suffering individual states it is, existing when the feeling person says it does" is commonly held by healthcare providers. However, even within this context, it is the healthcare providers' knowledge and attitudes that govern the response to the patient's experience of pain.

Rodrigues et al (2016:412) conducted a cross-sectional design among 60 back patients with LBP in Brazilian and Spanish Public Health Services to determine variances in pain perception between individuals. They assessed pain by using different pain reporting tools. The study showed that pain perception in patients with LBP is affected in some respects depending on the country of residence. The Spanish group showed a consistent pattern of correlations with specified clinical data. Within Brazilian patients, fewer correlations were found and all of the coefficients were lower than those in the Spanish group. They found that Spanish women reported a greater pain index, poorer mental health, poorer mood, and a poorer quality of life than Spanish men and the Brazilian patients. There were no differences observed in the pain intensity and disability. The level of relationships between pain, disability, quality of life, mood, and sleep patterns was significantly higher in Spanish patients with LBP than among Brazilian counterparts. This suggests that the condition exists as a global problem affecting different nations in a multidimensional context. The researchers concluded that pain perception in patients with LBP is different depending on the country or origin.

Strengths of the research related to its focus on the social and cultural aspects of LBP as was elaborated on, within the clinical context; the involvement of two different countries, equal number of sample sizes allowed comparisons between the two countries and suggested future research directions to determine the potential relevance of cultural factors in patients with LBP. The limitations related to the study's small sample size which could decrease the power of multiple comparisons, clinical heterogeneity of the patients could influence the results, social variables were neither collected nor studied, which limits the

applicability of the results, they did not collect outcomes on catastrophism or kinesiophobia, and the questionnaires used in the study were not specific for back patients.

Rodrigues et al (2016:1) conducted a qualitative phenomenology study of chronic LBP patients in Spain and Brazil, purposively sampled. Data were collected from 22 Spanish and 26 Brazilian patients using in-depth interviews, researchers' field notes and patients' personal diaries and letters. A thematic analysis was performed and the guidelines for reporting qualitative research were applied. Their mean participant age was 50.7 years (SD ± 13.1 years) and the themes identified were included: ways of perceiving and expressing pain, the socio-familial environment as a modulator of pain, religion as a modulator of pain, and socio-economic and educational status as a modulator of pain. The influences of LBP can be determined by how patients define pain and the effects of socio-cultural factors. Religion can be also considered as a possible mechanism for patients to manage pain and as a form of solace.

At this point, the researcher acknowledged the variations of the studies done in other settings in terms of study population, sample size, context, methodology, and data analysis. Once LBP was developed, prevention would be difficult as a measure to curb advancement of LBP from acute to chronic types. Thus, preventing the occurrence of LBP before its onset with healthier individuals will prevent disability and save resources. Therefore, to understand the influences of culture on the development of LBP, the cultural dependent modifiable risk factors should be explored.

Culture dependent modifiable factors are those bio-medical and culture-based risk factors that promote the occurrence of LBP among back patients who are attending clinical services in public hospitals of Addis Ababa. These factors are believed to be dependent on the culture of the community that they are live in for their day-to-day lives. The researcher believed that those back patients have immense experiences on LBP and better explanations for how they developed it than any other group of the community that was studied. The researcher was interested in exploring the culture dependent modifiable risk factors among participants with a focus on their socio-demographic characteristics and other important risk factors.

2.6.4 Consequence of low back pain

Low back pain is a major public health problem in terms of personal, social, economic, and healthcare burden (Hoy et al 2012:1 & Yilmaz & Dedeli 2012:598). It has direct and indirect impacts on the individual, family, society, industries and the government (Yang et al 2016:459). Generally, the consequence of LBP can be seen in the mental, physical, occupational, social, and economic aspects of individuals (Ogunbode et al 2013:5). The consequences of LBP are illustrated by the fact that:

1) The mental impacts include anxiety, depression and insomnia.
2) The physical impacts can restrict toileting, driving, household chores, and leisure-time activities.
3) Occupational impacts included poor physical performance, deterioration of general physical status, and decreases in an individual's capacity to perform occupational activities.
4) The social impacts included participants' inability to attend any type of social programmes.
5) The economic burdens were significant and increased mainly in the resource restricted countries and millions of dollars are spent annually to manage LBP.

Impacts of LBP from family perspectives included a resulting inability to help family members in different home activities due to pain. It can lead to individuals not being able to participate in any form of social gatherings and/or religious ceremonies. It is also the commonest disorder that reduces the productivity of communities. This can be associated with, activity restrictions, work absenteeism, disability, loss of productivity, and declined quality of life (Bath et al 2014:1966 & Williams et al 2015:1). Thus, it is a serious disorder related to high rates of morbidity, and comorbidity that leads to mortality (Williams et al 2015:2).

Alongside the above-mentioned consequences, back patients are advised by their physicians to take rest and reduce activities. Furthermore, their physical fitness might be compromised by fear of pain, analgesic effects, and injury which predisposed them into the deconditioning syndromes. These can lead to the incidence of chronic medical conditions like; dyslipidaemia, hypertension and chronic heart disease. Thus, back patients are highly

susceptible to pain, relapses, physical disability, psychological distress, and an increased risk of death due to these comorbidities.

2.6.4.1 Pain and severity

The first symptom back patients complain of is pain. Healthcare providers used different tools to quantify the levels of pain and severity after developing LBP. Pain and severity of LBP can be measured via numerous types of measuring scales. Pain can be commonly measured by means of Visual Analogue scales (VAS) and Numeric Rating scales (NRS). The severity of LBP is reliant on the individual capacity to feel pain and emotional expressions. Though, severity is the key factor in the decision to seek healthcare services. This impression was supported by a military cohort study by George et al (2012:4) whose study showed that educational level and last physical fitness scores were predictors of all NRS pain intensity ratings. Whereas, the duration of services and better scores were predictors for highest NRS. By contrast, lower educational and fitness levels were predictors of higher pain intensity scores (George et al 2012:3). Also, a study by Falavigna et al (2015:359) reported that the mean of VAS intensity of pain in middle-aged people in Brazil was 4.51 (± 2.27). Therefore, pain and level of severity adversely affected the quality of life and functional capacity of back patients (Yilmaz & Dedeli 2012:598). If not treated as soon as possible, it may progress from a short term, to a long term and permanent disability.

2.6.4.2 Disability

Low back pain is the most common devastating disease that leads to disability (Shemory et al 2015:413 & Yang et al 2016:460). Disability is seen as a major consequence of LBP and has a huge economic impact on the society (Suri et al 2017:6). Disability can arise from pain itself, loss of function, and some other related comorbidities. A systematic review by Yilmaz and Dedeli (2012:598) concluded that disability and compensation costs were the two major implications of LBP in Turkey. Disability due to LBP was responsible for at least 60% of the reasons for the changing of one's workplace, 58% influence on sleep disturbances, 42% of seeking medical treatment, 40% of "premature retirements", and 28% of restriction of daily activities. Frequently, disability adversely affects individuals' quality of life by deteriorating their physical performance, cardiovascular well-being, social activities, occupational performance, and sleeping patterns (Ogunbode et al 2013:2 & Shemory et al 2015:413).

Furthermore, high pain and disability scores suggested increased chronicity of LBP (Yilmaz & Dedeli 2012:598).

Disability of LBP can be measured by using the Oswestry Disability Index (ODI). A study conducted by George et al (2012:4) concluded that gender, smoking status, limited work duty, and previous injury status were the baseline predictors of ODI score. The descriptive statistics for infirmity reported during first LBP episode were 9.8 (SD = 11.7) for ODI score and 1.3 (SD = 4.5) for number of days with limited work duties in the past 30 days. Hence, smoking and history of previous injury were predictors of disability. Being male was a predictor of lower disability scores compared to being a female. Specifically, men on average scored 3.2 points lower on the ODI than women. While, soldiers who smoked prior to entering the Army scored on average 2.7 higher than those who did not and those who had a previous non-LBP related injury scored on average 3. 4 higher on the ODI than soldiers who had not.

2.6.4.3 Healthcare utilisations and work absenteeism

Individuals suffering from LBP tended to use healthcare services continuously (Ogunbode et al 2013:6). Shmagel, Foley and Ibrahim (2016:1688) conducted a national observational, cross-sectional study to describe the epidemiologic characteristics and association between LBP and increased use of healthcare systems in US adults. They found that patients with chronic LBP were socioeconomically disadvantaged, make frequent healthcare visits, and were often covered by government-sponsored healthcare insurance.

The substantial personal, family, community and financial burdens are expressively high for healthcare expenditure (Bener et al 2014:228). Annual healthcare expenses related to LBP in the USA were estimated to be $90 billion, in the UK $17 billion and in Australia $1 billion (Hoy et al 2012:2 and Yang et al 2016:460). It is estimated that 50% of costs in the industrialised world are related to compensation for workers (Kjaer et al 2017:1). Prone sufferers are often absented from their working environment. This is supported by Sinha (2017:933) who confirmed that the majority of workers failed to attend work for at least six weeks to LBP. Similarly, a study done by Zungu and Nigatu (2015:18) confirmed that more than half of the participants (53%) reported to have been absented from their work due to LBP; and a noteworthy association was found between taking sick leave and LBP. LBP significantly affected workers' fitness level and leads to high rates of compensation claims.

In addition to the compensation costs, it contributed to 23% work absenteeism. These issues raised questions about the level of pain they feel, incidence of new episodes of injury, and job security. Therefore, the longer sufferers had been absented from their working station, the greater the jeopardy of everlasting omission from the labour market. Overall, the summary of the literature findings is presented as follows.

2.6.5 Summary of the literature findings

In summary, different viewpoints were expressed in relation to the prevention of LBP and the treatment options also have limited efficacy. Some authors tried to recommend LBP could be best prevented by lifestyle modifications such as exercise programmes, smoking cessations, weight reduction, culturally acceptable health promotion behaviours and following ergonomics through modifying working environments (Ogunbode et al 2013:7). But some other authors recommended that back school, lumbar support, and ergonomic interventions were effective in minimising the rate of incidence of LBP. Similarly, George et al (2012:3) identified that better mental health, the highest physical health scores, and being male were protective factors against the development of LBP. But these deterrence mechanisms have inadequate evidence as a basis for the prevention of LBP.

Due to lack of widely used preventive mechanisms, LBP continues to be a public health problem throughout the world (Bener et al. 2014:228). The constraint of many researchers related to their inability of determining which factors predicted the development LBP before additional preventative models can be developed (George et al 2012:3). If the key bio-medical and culture based modifiable factors are identified as being predictive factors of LBP, then the researcher can logically develop a culturally sensitive preventative model that can be used for the general population. The primary aim of this study was to develop a model that could be used to prevent overall development of LBP in the general population. The main purpose of the model would be to support the eradication, elimination or minimisation of the incidence of LBP and its impacts on the community.

2.7 SUMMARY AND FUTURE DIRECTIONS

LBP is a major public health problem throughout the world. Different studies have revealed that its prevalence is rising in Africa and represents a serious cause for concern. It has been given relatively little public health attention compared to hypertension and diabetes mellitus.

This is the case in Ethiopia. It is the major restricting disorder next to Iron deficiency anaemia and major depressive disorders. It may contribute to the community being unable to cope well with their daily activities. On the other end, researchers have been unable to identify approaches to support the prevention of its development by identifying bio-medical and culture based modifiable risk factors.

In the era of sustainable development goals, critically concerned with the prevention of most communicable diseases, LBP has remained neglected despite the serious disability impacts to the society. It affects all segments of the humanity without restriction and racial discrimination. Therefore, there is a need for taking measures that prevent its development and reduce its increasing prevalence rate.

Different epidemiological studies were done in different parts of the world that focused on the prevalence and associated risk factors. As a reviewer, researchers identified that the knowledge about the development of a culturally sensitive preventative model by exploration of cultural and social factors in vulnerability to LBP is unconvincing. The appraisal revealed that almost all literatures included in the review are traditional epidemiological studies with varies study designs, study populations, and methodologies. Hence, their findings and conclusions are also contradicting to each other.

To the researcher's knowledge, no study exists to explore the influence of cultural and social factors in vulnerability to LBP to develop a culturally sensitive preventative model. This study targets those factors that are the sturdiest predictors of LBP development. Accordingly, a conceptual framework guided by a mixed method exploration of cultural and social factors, will be implemented. This study enabled the researcher to identify evidence on the modifiable risk factors and influence of cultural and social factors in vulnerability to LBP to develop a culturally sensitive preventative model that used to prevent the development of LBP in the Ethiopian context. Ethiopia is undergoing an era of epidemiological transition from communicable diseases to non-communicable diseases. This transition challenges the restricted healthcare system to prioritise non-communicable diseases. The purpose of this study was to develop a preventative model by exploring the bio-medical and culture based modifiable risk factors for LBP and the influence of cultural and social factors in susceptibility to LBP. The findings from this study will add knowledge to existing empirical evidence on the prevention of LBP in the resource restricted country contexts.

CHAPTER 3

THEORETICAL/META-THEORETICAL GROUNDING

3.1 INTRODUCTION

In the previous chapter, the researcher discussed literature related to the different concepts, prevalence, associated factors, and consequences of LBP. The chapter also explained the influence of socio-cultural factors on the development of LBP. In this chapter, the researcher mainly focuses on the theoretical framework that the study is established on. This chapter further focuses on the discussion of the definition and purpose of theoretical framework, bio-medical model, biopsychosocial model, pain theories, health belief model, and the application of these theories on the development of LBP. The chapter also discusses in detail, how the identified theoretical models helped to guide the research processes.

The term theoretical framework consists of two separate words, which are theory and framework. According to Kerlinger (1986:9) a theory is:

> "*a set of interrelated constructs, definitions, and propositions that present a systematic view of phenomena by specifying relations among variables with the purpose of explaining and predicting phenomena*".

A theory shapes current understanding of a specific phenomenon and may be methodically verified in the physical domain by research. It guides researchers to ask appropriate research questions and to predict and explain the results of the research. It initiates, directs, and produce thoughts for research; research measures the value of existing theory and delivers a groundwork for novel theory (Brink 2009:23).

A framework is defined as a collection of ideas that are used when someone is interested to form decisions or judgements (Bedworth & Bedworth 2010). It assists the researcher to organise the specific study and delivers a perspective in which he observes prevention of LBP and collects and analyses data (Brink 2009:24). The framework gives structure within which the interactions between variables of LBP are described.

A model is defined as a diagrammatic representation of realism. It provides a symbolic depiction of certain associations among phenomena of LBP, and it uses diagrams or symbols

to denote an idea. It may help the researcher to define and guide specific research tasks or deliver a structured framework (Brink 2009:23).

The theoretical framework is defined as a theory describes the relationship between key variables for explaining LBP or predicting future consequences. Grant and Osanloo (2014:12) defined theoretical framework as a lens which offers the organisational methods of the study in a philosophical, epistemological, methodological, and analytical way. The selection of a theoretical framework requires a deep and thoughtful understanding of the prevention of LBP, its purpose, significance, and research questions. It is vital that all theories are firmly attached and interact with each other so that the framework can serve as the foundation for the work and guide the choice of research design and the data analysis (Grant & Osanloo 2014:12).

The difference between a theoretical and conceptual framework is that the earlier is based on the propositional statements developing from a prevailing theory, while the latter is what the researcher has established through finding and defining thoughts and suggesting relationships between these concepts. Both frameworks interconnect theories to generate a specific way of observing a specific phenomenon. By developing a framework within which ideas are organised, the researcher is able to demonstrate that the planned study is a reasonable extension of existing knowledge (Brink 2009:24).

In mixed methods, a conceptual framework can be used as deductively in quantitative theory testing and inductively in an emerging qualitative theory (Creswell 2014:68). The researcher should move back and forth between deductive and inductive reasoning if his intention is to develop a model. A theoretical framework has a number of purposes, which improves the quality of research (Grant & Osanloo 2014:20). According to those two authors, theoretical frameworks can be used to:

- Link the researcher to the current literatures.
- Provide expectations that direct the research.
- Support the researcher to select appropriate enquiries for the study.
- Guide the researcher to choose the research design with highest quality.
- Guide the researcher towards suitable data collection approaches.

- Support the researcher to make predictions of the data collection, analysis, interpretations, and results of the research founded on the existing literatures.
- Persuade the reader of the significance of the research questions.

For this study, three theories were incorporated to collect, analyse, and integrate the data. The three theoretical frameworks integrated in this study were the bio-medical model, pain theories, and health belief model. These frameworks have been taken from the medical and behavioural sciences to have a clear understanding of the research questions. The bio-medical model elaborates the interaction of the socio-demographic, lifestyle, work-related, and psychosocial factors of LBP.

The biopsychosocial model elaborates the complex interaction of the social, cultural, and environmental factors within the individual back patients' perspectives. In addition, the pain theories explain the severity of the complex phenomenon of LBP. Similarly, the health belief model further explores in-depth, the influences of the cultural and social factors on the development of LBP. All the information gathered was formed the basis for the researcher to develop a theoretical framework of the study. Consequently, the questions in the questionnaire were based on the combination of the bio-medical and health belief models.

Theoretical frameworks assist the researcher to design data collection tools and analyse the collected data. The researcher integrated the concepts from these theories as a way of supporting the development of data instruments and as a basis for the areas that used to focus on in data analysis. The role of integration of concepts from the theories in mixed methods can be quantitatively where theory is verified (deductive) and qualitatively where patterns are emerging (inductive) depending on the research question. Table 3.1 below presented the theoretical applications of the stated theories on the current study.

The researcher used bio-medical, pain theories and health belief model to answer the research questions. The reasons why the researcher chose these models were:

1. The bio-medical model enables the researcher to identify associated risk factors of LBP.
2. The biopsychosocial model provides a framework to explore the socio-cultural risk factors of LBP.
3. The pain theory assists the researcher to estimate the severity of LBP.

4. The health belief model helps the researcher to explore the bio-medical and culture based modifiable risk factors of LBP and the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours.

5. It also gives an opportunity to apply different theories to examine the research problem in relation to various perspectives.

Table 3.1 Theoretical applications of the stated theories in the study

Deductive application of the theories	Inductive application of the theories
The theory is well established, and researcher used to provide an explanation or prediction about the relationship among variables in the study. In this type of the theoretical framework the researcher used deductive-objective-generalising approach for answering questions such as "What?"	In qualitative phase of the study, the theory is emerged later on the study. In this type of the theoretical framework the researcher used inductive-subjective-contextual approach for answering questions like "How?"
Application in phase I of the study	**Application in phase II of the study**
The theory assists the researcher for constructing of variables to be measured when investigating bio-medical and culture based modifiable risk factors of LBP. The integration of the biomedical, HBM and the theories of pain formed the foundation for the development of the survey in this quantitative phase of the study. In this study the researcher is answering the question relating to "What are the bio-medical and culture based modifiable risk factors for LBP?"	The study started gathering information from study subjects through IDIs and KIIs that allowed the process of objective analysis of the modifiable risk factors. Then this information forms into codes, sub-themes, and themes which developed into broader patterns, theories, or generalisations. In this study the researcher is answering the question relating to "How do cultural beliefs influence the development of health promoting and health jeopardising behaviours in the development of LBP?"
Integration in mixed methods: Based on the quantitative and qualitative orientation of this explanatory sequential study, the deductive theory drives the study with an element of inductive theory embedded in the study.	

In the following paragraphs, these theoretical models and theories are discussed in brief.

3.2 THE BIO-MEDICAL MODEL

The bio-medical model is defined as a proxy for the human biological system and is used to recognise normal and abnormal physiological function. It started from gene to phenotype and that enables preventive or therapeutic management of diseases (Ghaemi 2010:10). It was invented by medical scientists for the study of specific disease. As such, it is a scientific model involved as a shared set of norms and specifies the rules of conduct based on the scientific method and constitutes a blueprint for research. It is the dominant model of disease today, with molecular biology is its basic methodical discipline. It adopts disease to be fully accounted for by deviances from the model of determinate biological variables. It has four core elements: disease, pain, defect, and healthy (Engel 1977:130).

3.2.1 Principles of the bio-medical model

The bio-medical model has a lot of assumptions which can be explained as below. These are based on the updated discussions by Adibi (2014:18):

- Dualistic: the dialectical division between mind and body is at the core of bio-medical model.
- Mechanistic: the causes and risk factors of LBP are open to discovery, classification, and understanding by scientific procedures.
- Reductionist: the biological descriptions of LBP is required out from the experimental behaviours of the body and the particles related with the conditions.
- Empirical: knowledge is produced by observation and can be established through a process of testing.
- Interventionist: medical knowledge can be functional to repair injury or sick biological systems.
- Low back pain is an illness of the body and is distinct from the psychological and social procedures of the mind.
- Low back pain has a specific pathologic cause, whose management can best be proficient by removing or controlling its distinguishing cause.

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3.2.2 Application of the bio-medical model for the development of low back pain

Different authors provided a bio-medical conceptual framework for the development of LBP. In acknowledgement of the need to further clarify the occurrence of LBP, several models have tried to identify the interaction of different factors. The Norasteh (2012:12) model tried to include the basic bio-medical and some other psychosocial risk factors of LBP. The study was designed based on the theoretical grounding theory that socio-demographic, lifestyle, work-related, and psychosocial risk factors can determine the occurrence of LBP. If those factors are not prevented early, it can end up with activity restrictions, changing profession, work absenteeism, and heath care utilisations. The bio-medical model used for this study is presented in chapter one in figure 1.1. Here below the researcher further explains five areas of the bio-medical model for the purpose of this study. These are:

1. The first risk factors are socio-demographic factors that includes: age, gender, marital status, educational level and prior medical history. In addition to this, socio-economic status, home-made activities, hormonal changes, menstrual-related problems, pregnancy and osteoporosis might lead to LBP.
2. The second risk factors are lifestyle factors which contains smoking, alcohol, and exercise habits.
3. These factors are work-related factors that include occupation, workload, lifting, pushing and pulling, frequent bending and twisting, awkward posture and whole-body vibration.
4. The last set of risk factors are psychosocial factors that consist of job dissatisfaction, poor social support, poor working environments, stress, anxiety and depression (Norasteh 2012:14-18).

In summary, this theoretical framework helped the researcher to understand the associated risk factors that might contribute to the development, severity and impacts of LBP. By using this framework, the researcher was analysed the issues related to the development of LBP. Moreover, it allowed the researcher to link observations, facts, and other concerns together into an orderly scheme and to develop data collection tools. Finally, this diagram has contributed to enabling the researcher to develop the preventative model

3.2.3 Criticism of the bio-medical model

The bio-medical approach takes the reductionist view that all phenomena are best understood at the lowest cellular or molecular level of natural systems. It leaves no room within its framework for the integrated psychological, social, and cultural magnitudes of disorders. It is not only requiring that disease be dealt with as an entity independent of social behaviour, it also demands that behavioural aberrations be explained on the basis of disordered somatic processes. Thus, the bio-medical model embraces reductionism; the philosophical paradigm derived from a single primary principle, and the doctrine that separates the mental from the somatic. Here the reductionist primary belief is bio-medical that assumes the dialectal of biochemical will eventually suit to clarify biological phenomena (Havelka, Luanin & Luanin 2009:305).

The historical fact we have to face is that in modern western society, biomedicine not only has provided a basis for the scientific study of LBP, but it has also become our own culturally specific perspective about LBP, that is, our folk model. This particular study designed based on the grounding theory that bio-medical and socio-cultural factors can determine the occurrence of LBP. The fact that the current focus of the study is on a range of complex issues and for that reason, more than one theoretical framework is integrated into the study. The science of medicine is still based on the notion of the body as a machine of diseases and as a consequence of breakdown of the machine. But a new broad concept has emerged in medicine. This is a holistic and ecological view called the biopsychosocial model (Engel 2012:377).

The next section discusses the biopsychosocial model and its applications on this study.

3.3 THE BIO-PSYCHOSOCIAL MODEL

3.3.1 Introduction

A biopsychosocial model is defined as the dynamic interaction of the genetic inheritance (nature) and the environmental influences (nurture). This is further explained by integrating fully the internal and external biological and intra-psychic dimensions with the interpersonal and social dimensions (Cooper, Bilton & Kakos 2012:1). It was first developed in 1977 by American Psychiatrist George Engel in Rochester. The model argues that the development

of LBP is not based on one factor only, but it is the interaction between people's genetic makeup (biology), mental health and behaviour (psychology), and socio-cultural environment (social world) (Havelka, Luanin & Luanin 2009:306).

3.3.2 The rationale of using the biopsychosocial model

The traditional bio-medical model was focused on the pure scientific aspects of pathophysiology and other biological approaches to LBP. While, the biopsychosocial model emphasised the importance of understanding human health and illness in their fullest contexts (Engel 2012:378). The biopsychosocial approach distinguishes that different scientific situations may be most useful, understood scientifically at several levels of the natural systems continuum (Engle 1980:535). The psychosocial factors are not merely epiphenomena: they can be understood in scientific ways at their own levels, as well as in regard to their biological correlates. Thus, the approach can be seen as being essentially ecological in nature, this making truly holistic and capable of capturing the complexity of the phenomena under study (Cooper, Bilton & Kakos 2012:1).

This is a new paradigm in medicine that goes beyond a purely bio-medical approach to take account the role of psychological and socio-cultural factors and their complex interactions in understandings of influence of cultural and social factors in vulnerability to LBP (Borrell-Carrió, Suchman & Epstein 2004:577). The approach has been developed to understand the interaction of physiological and psychological factors in the causes and management of physical illnesses. It is further used to understand the process of aging (Havelka, Luanin & Luanin 2009:306). The interaction between development of LBP and the biological, psychological, socio-cultural and environmental factors is illustrated in the following diagram.
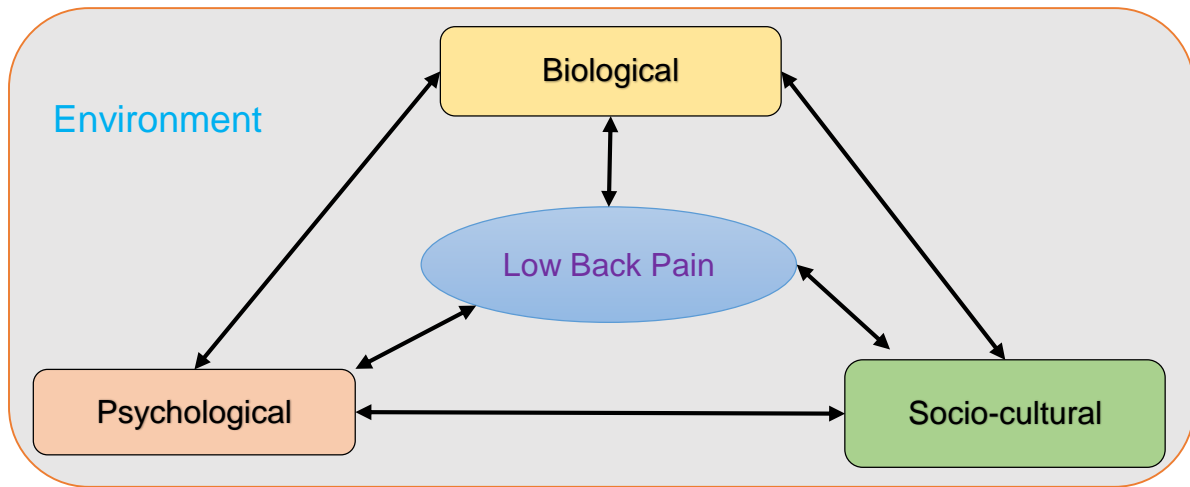
Figure 3.1 The biopsychosocial model and occurrence of LBP (after Engel 1977, 2012)

Figure 3.1 above represents an attempt to integrate the biological, psychological, social, environmental and cultural factors on the development of LBP. This may be seen from a predisposing factor, precipitating stimuli, precipitating response, and maintaining process perspectives. The presence of a biochemical, physiological, and anatomical abnormalities on the lumbar spine is the primary constituent of the biological factors of the model. This predisposition involves of a reduced threshold for nociceptive stimulation that can be associated to genetic risk factors, history of back trauma, or social learning experiences and results in a biological response stereotype of the lumbar spine (Frankel, Quill & McDaniel 2003).

The secondary components of biopsychosocial model include potential psychological factors that may contributed to the development of LBP. The presence of obstinate negative internal or environmental stimuli with negative psychological perceptions activates the sympathetic nervous system and muscular processes (e.g., several negative emotional impetuses, such as familial fights or stress on the working environment) and motivates avoidance responses, like inactivity and immobility. An important role played by the cognitive processing of internal and environmental stimuli is related to the experience of stress and pain, for example, increased perception, pre-occupation, and over-interpretation of physical symptoms or inadequate perception of internal stimuli, such as muscle tension levels. Moreover, the nature of coping response, includes active avoidance, passive tolerance, or depressive withdrawal may determine the type of problem that develops, as well as the course of the

illness. Subsequently, maladaptive behaviours, like increased muscle activity, persistent sympathetic arousal, and sensitisation of central cortex, may induce or exacerbate pain episodes (Roth, Geisser & Williams 2012:110).

Learning processes in the form of fear of movement contributed to the development of chronic LBP. These processes lead to the maladaptive patient's behaviours and determine their pain perception. It is individual back patients processing of information results in anticipatory anxiety and avoidance behaviour (Frankel et al 2003).

Precipitating stimuli may be considered in terms of their excessive intensity, duration, or occurrence of an internal or environmental stimulus. Inadequate or maladaptive psychological, reasoning, or physical collections of the individual to reduce the impact of these negative internal or environmental stimuli are among the precipitating responses. Finally, social activities, physician advice to reduce some types of actions, culturally determined living styles, and physiological pain reactions may maintain the pain experiences (Frankel et al 2003).

Socio-cultural factors include income status, culture, technology, circumstances, expectations, beliefs, and religion. Such life events contribute to LBP development. The impact of socio-cultural factors is widely recognised in chronic disorders. It can even differ across a single city, from lower-income to higher-income areas, and rates of disease and illness differ across these communities, accordingly. Research indicates that individuals prone to over-crowding and poverty are more at risk for developing chronic musculoskeletal disorders. For example, losing one's job or ending a romantic relationship may place one at risk of stress and illness (Hunt 2014:57).

3.3.3 Conceptualisation of the biopsychosocial model

Nowadays, many diseases show multi-factorial aetiologies and that the manifestation of symptoms requires the complex interaction of several risk factors. Illnesses are, therefore, caused by the convergence of several risk factors that can be classified as biological, psychological, social, and cultural relationships (Jaini & Lee 2015:50). The importance of this model is unlimited, as it can be functional to any individual in any state without having to isolate a specific underlying biological cause, which is sometimes impossible to do. Whereas,

the bio-medical model restricts itself to searching for a specific underlying cause of diseases, but the biopsychosocial model explores all aspects of a disorder.

The main focus of the biopsychosocial model is, thus, on the patient rather than on symptoms and pathophysiology of LBP (Jaini & Lee 2015:50). The theory posits that each one of these factors is not sufficient to bring about health or illness, but the interaction between them is what determines outcomes. Empirical literatures suggested that it is the combination of health status, perceptions of health, and socio-cultural barriers to access healthcare that influence the likelihood of a patient engaging in health-promoting behaviours (Roth et al 2012:110). This model accentuates the patient's explicit thoughts and feelings, in addition, to implicit risk factors, because these will all influence behaviours. Failure to integrate each of these risk factors will lead to an incomplete understanding of the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours for the development of LBP.

From this perspectives, prevention of LBP requires a broader strategy than those based on the previous dichotomous models that prescribed on the sense of do and do not do. Chronic conditions, like LBP, are affected by multiple aspects of personality and the effects from the living and social environment. The researcher assumption is that long-term maintenance of behavioural changes will occur only if the health individuals have learned to attribute success to personal efforts. Hence, the biopsychosocial model elaborates the complex interactions of the social, cultural, and environmental factors with the development of LBP.

3.4 PAIN THEORIES

3.4.1 Introduction

Kumar and Elavarasi (2016:87) defined pain as:

> *''a complex unpleasant sensory and emotional experiences arising from actual or potential tissue damage, or described in terms of tissue damage, or both''.*

On the other side, pain can be explained on the basis of neural substrates mediating the sensory, affective, and nociceptive functions, as well as responses from neuronal structures. The sensory component permits the spatial and temporal localisation and the physical qualification and intensity quantification of the noxious stimulus. The affective component

attributes emotional colouring to the pain experience, and the nociceptive functions as being responsible for behavioural changes that occur after perceiving pain.

A number of pain control theories have been postulated to explain the mechanism of pain for patients suffering from chronic pain. The commonest theories are specificity theory, pattern theory, sensory interaction theory, gate control theory, and neuromatrix theory. The specificity and pattern theories are two opposing theories, the earlier stated that pain is a specific modality, like vision or hearing, with its apparatus located in the periphery or central body parts, and the later explains the nerve impulse for pain is produced by a continues stimulation of the pain receptors that are found in our skins. But the sensory interaction theory states about the slow and fast systems involving on the transmission of pain (Melzack & Wall 1965:971).

The following subsections serve as a basis for explaining some of the most influential theories regarding the perceptions, explanations and presentations of low back pain among sufferers.

3.4.2 The gate control theory of pain

Melzack and Wall postulated the Gate Control Theory of Pain that revolutionised pain research. This theory provided a model that tried to explain the controversial results and supported the specificity and pattern theories. It consists of three systems located in the spinal cord, which act to influence the perception of pain. These are the substantia gelatinosa, dorsal horn, and central transmission cells (Melzack & Wall 1965:974). The substantia gelatinosa function is a gate control system that modulates the synaptic transmission of nerve impulses from peripheral fibers to central cells. The dorsal horn of the spinal cord is responsible for fleeting information which can be interpreted as pain. The pain full stimuluses are influenced by a gate mechanism. When the smaller (unmyelinated) fibres are stimulated, the gate is opened. Stimulation of the larger (myelinated) fibres closed, the gate and inhibits the transmission of pain (Cohen, Brown, Romano & Engel 2010). When the gate is opened, pain signals excite the dorsal horn cells and reaches to the brain cells. When the gate is closed, signals from the small diameter pain fibres do not excite the dorsal horn transmission neurons. The gating system is affected by nerve impulses that originated from the brain (Dickenson 2002:755).

Smeltzer and Bare (2004) stated that there are events and conditions that may open the pain gate and cause suffering. These are:

- Physical factors- physical injury,
- Emotional factors- anxiety and depression, and
- Behavioural factors- susceptibility to injury and concentrating on the pain.

Otherwise, there are circumstances that can close the pain gate and reduce suffering. These conditions include (Smeltzer & Bare 2004):

- Physical pain- analgesic remedies and physical activities,
- Emotional pain- being in a good mood and relaxation, and
- Behavioural factors- concentrating on doing things than thinking about the pain.

Many anatomic factors can play a primary or secondary role in the development and progression of LBP. The lumbar spine supports the torso and permits flexion, lateral flexion and extension. The facet joint alignments restrict rotation except at the lumbosacral junction, where, heavy iliolumbar ligaments provide restraint. At the junction of the fifth lumbar vertebra and the sacrum, the sacro-vertebral angle slopes downward, causing the truncal centre of gravity, after passing through the fifth lumbar vertebra, to press on the thick anteriorly wedged fifth lumbar disk (Balague, Mannion, Pellise & Cedraschi 2012:482). This in turn, leads to increased wear and tear on the lower lumbar disks, the adjacent vertebrae and their facet joints, and hence to inter articular laminar deficiencies, which predisposed the lumbosacral junction and lower lumbar vertebrae into LBP (Swezey & Calin 2003:9).

The precise patho-physiological mechanisms involved in pain perception of LBP are not well understood. When tissue damage occurs, a lot of neuro-humoral causes may be thrilled. In the intervertebral disks, a normal disc is highly innervated by pain fibres and capable of provoking a pain response. The same is true for the posterior longitudinal ligament of the spine (Balague et al 2012:482). Afferent neurons in the dorsal root ganglia stimulate production of a chemoattractant and vasodilator; substance P, and somatostatin, neuropeptides including prostaglandins and leukotrienes. Prostaglandins and leukotrienes are released by activated nociceptors when there is local tissue injury to the annulus and/or adjacent neural, ligamentous and synovial tissues, and play important role in pain, inflammation, and healing processes (Swezey & Calin 2003:11).

Any painful stimulus affecting the spine is ultimately experienced in the mind. There is modulated by genetically pre-determined pain transmission and response abilities, familial structures, socio-cultural factors, and further aggravated by medico-legal and work-related factors. All of these factors are further modified by general and specific health issues; like experiences of previous back trauma, surgery, and medications (Swezey & Calin 2003:9).

Pain is commonly expressed by its location, duration, intensity, and aetiology. Location is where the pain is on someone's body. This is important as pain can also be deferred from another symptom. Duration is the longevity of pain in terms of acute and chronic type (Cheung, Karppinen & Chan 2009:934). Intensity is judged on a scale of zero to ten. Zero is considered to be no pain, and ten is considered to be the worst possible pain. When patients rate themselves between one to three on the pain scale, then the pain is considered to be mild. If patients rate themselves between four to six, then the pain is considered to be moderate. Any pain rated seven and above is considered to be severe pain. Aetiology is the causative factors for the occurrence of pain (Balague et al 2012:483).

In general, LBP is a complex multi-dimensional phenomenon with the involvement of sensory, affective, cognitive, attitude, and evaluative components (Melzack 1996:128). This theory tried to include the physical and psychological aspects of pain. Understanding of the gate control theory directed to the use of an appropriate pain assessment tools, such as the VAS that used to ascertain the severity of LBP. moreover, from this theory, it also indicates that the researcher could understands the feelings, thoughts, sprits, and beliefs of back patients to LBP in order to develop a culturally sensitive preventative model. However, the gate control theory cannot sufficiently explain the complexity of LBP. Due to this reason, the researcher introduced the neuromatrix theory of pain in order to have a greater visual representation of the lived experiences of back patients on LBP. This new theory is presented as follows.

3.4.3 The neuromatrix theory of pain

Melzack made an important contribution to the understanding of the central nervous system (CNS) as contributing gateway to the understanding pain perception. He noted that the brain is an active system that filters, selects, and modulates imputes to the CNS. He emphasised that the dorsal horns of the spinal cord are not merely passive transmission stations but have

dynamic activities, where inhibition, excitation, and modulation occur. He proposed that the brain possessed a network of nerves, called the body-self-neuromatrix, which integrates multiple inputs to produce an output pattern that evokes pain sensation. This network includes the ability to be sensory, affective and to evaluative dimensions of the pain experiences (Melzack 1999:123). According to this theory, the multiple inputs that act within the neuromatrix programmes include:

1) Sensory inputs from the skin, organs, and other somatic receptors,
2) Visual and other sensory inputs that influence our cognitive interpretation,
3) Cognitive and emotional inputs from other areas of the brain,
4) The inhibitory modulation of all brain functions, and
5) The body's stress regulatory areas including chemical, endocrine (hormonal), immune and opioid systems of the body, along with the genetic composition of the person.

The Neuromatrix Theory encompasses numerous interrelations between body systems and functions in contradistinction to the *"one-to-one relationship"* between the LBP generator and pain experience. It both sums-up many of the previously mentioned theories and clearly demonstrates the complexity of the LBP process which makes it not amenable to the simplistic peripheral philosophy of LBP (Cheung et al 2009:934).

The neuromatrix theory associates the initiation of the pain signals started with tissue damage and it is continuously detected by the peripheral nervous system, which then sends signals into the CNS. The spinal cord and brain receive the pain that sent from the area of damaged tissue. The first order neurons run from the area of tissues damage to the spinal cord. The second order neuron run from the spinal cord up to the brain stem, and the third order neuron goes from brain steam to the cerebral cortex (Cheung et al 2009:935).

This model of pain explains the pain generator and linkages between the tissue damage, the peripheral nervous system, and the CNS. There might be little or no correlation between tissue damage and occurrence of pain. For example, non-specific LBP is the commonest type of LBP. This means that there is no identifiable tissue damage seen on the spine. In other words, the imaging tests might have showed some types of disc abnormalities or some other sorts of pathologies. But it is hard to make a casual association between the real back

pain and the identified tissue damage. In this neuromatrix theory, the production of pain is from brain rather than the actual tissue damage or peripheral nervous system.

The model comprises two comprehensive mechanisms: first, pain is produced not by actual tissue damage and the peripheral nervous system that covers it, but rather by the CNS (brain and spinal cord) and second, various parts of the CNS are working together to produce pain. These parts are the spinal cord, brain steam, limbic system, insular cortex, somatosensory cortex, motor cortex and pre-frontal cortex. Specific areas of the brain contributed to various aspects of the sensory, emotional, cognitive, motor, behavioural, and conscious aspects. The intensity and emotional aspects of the pain is regulated by the limbic systems and the pre-frontal cortex senses the pain, and the somatosensory cortex feels the pain in the body (Cheung et al 2009:940).

The neuromatrix theory tried to explain various factors that influence the degree of pain. The degree of pain is influenced by different factors. These are prior experience about pain, injury, illnesses, emotional state, socio-cultural factors, immune systems, cognitive functions, and stress regulation systems can influence the level of pain perception. The neuromatrix theory of pain can assist with developing knowledge on how damage to the nervous system and cortical reorganisation can contribute to persistent LBP. The theory is illustrated in figure 3.3 below:
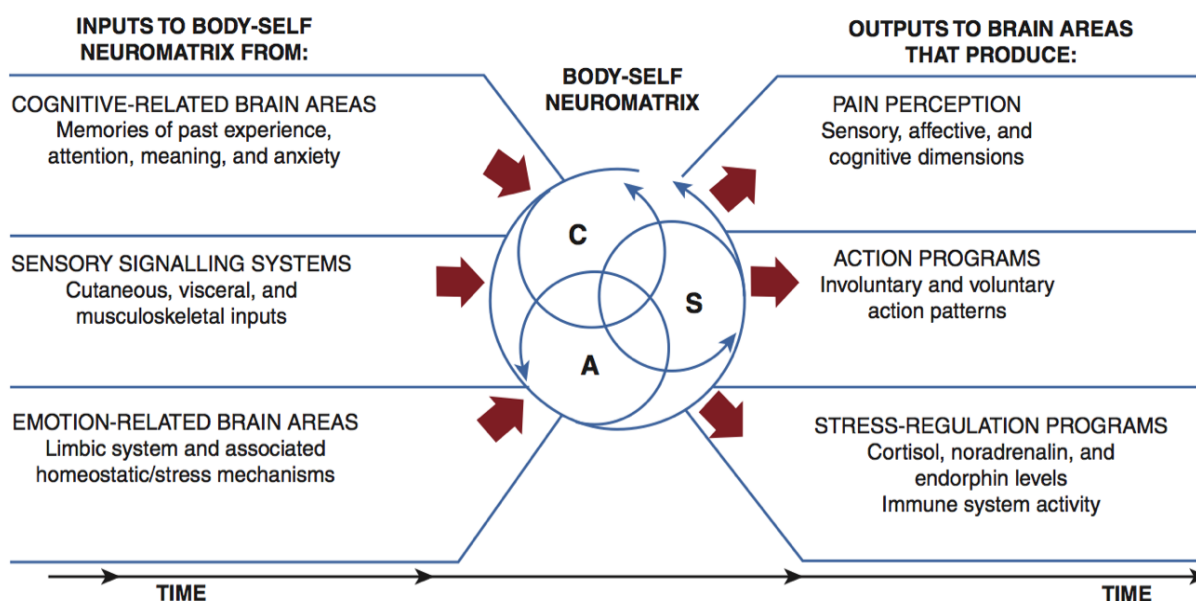
Figure 3.2 The neuromatrix theory

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Factors that contribute to the patterns of activity generated by the body-self neuromatrix, which is composed of cognitive, affective, and sensory neuromodules. In this theory of pain, the concept of pain is explained by the influences of multi-dimensional factors. These influencing factors are range from genetic, sensory, and other areas in the brain. Genetic influences on the perception of pain may determine or predisposed towards the development of LBP (Melzack 1999:123).

The critical analysis of the application of neuromatrix theory revealed that, even though the complexity of the mechanism is acknowledged, the sequence of the complexity of the mechanism is still not well understood. It is not clear where is the physical aspect of the pain that leads to the changes in the social behaviour of the individual or where all is triggered by psychological effect of the pain. Relating to this study, the concept of pathophysiology of LBP should be seen as a whole and not as a sequence of systems. In order to understand the causative agents of LBP, the researcher should theorise that the origin of pain is from the damaged tissue or the dorsal horn of the spinal cord, or the central processing system of the brain. Therefore, this model will assist the researcher to ascertain the pathophysiology and severity of LBP among individuals in Addis Ababa. Furthermore, Ethiopian communities have their own values, beliefs, attitudes, and perceptions that guided their response into LBP. Based on this foundation, experts advised to include other models in order to have full insights of the interaction between LBP and health promoting or health jeopardising behaviours (Vandiver 2009:92). Among the commonest behaviour change theories, health belief model is commonly used to understand such type of complex research problems. This model is discussed in brief as follows.

3.5 HEALTH BELIEF MODEL

The health belief model (HBM) is one of the oldest employed psychological models of health behaviour and remains the most widely recognised model to explain and predict cultural beliefs of individuals. It was developed in the 1950s by Hochbaum, Rosenstock and Kegels working in the USA Public Health Services. During initiation of the model, an emphasis was made on the screening programmes for disease prevention and early recognition (Rosenstock, Strecher & Becker 1988:177 & Jones, Jensen, Scherr, Brown, Christy & Weaver 2015:566). The model stated that health behaviour is determined by personal perceptions or beliefs about LBP and the approaches available to decrease its occurrence.

Individual perception is affected by the entire variety of interpersonal factors affecting health behaviour, including, but not restricted to knowledge, attitudes, skills, experiences, beliefs, religion, and culture (Haden 2017:58). It tried to explain changes and preservations of health-related behaviours based on the perception of LBP (Champion & Skinner 2008:45).

Over the past three decades, it has been expanded, compared to other conceptual frameworks, and used to support different interventions to change health behaviours (Rosenstock 1974:328). It is one of the widely used model in health behavioural researches. It assisted to understand health behaviour problems, developing interventions based on the relevant determinants that affect behaviours, and evaluating the effectiveness of the health interventions (Rosenstock et al 1988:177). The HBM also investigates why people fail to undertake preventive health measures. It focuses mainly on health motivators; therefore, it is most suitable for addressing behaviour-related problems that have health consequences. The HBM has been shown to successfully predict healthy eating behaviours, and weight and obesity management (Rosenstock et al 1988:177).

It is also used to predict why individuals will follow some recommendations and advices to prevent or control illnesses. The model consisted of interconnected concepts that a susceptible individual will form in their mind. If individuals concern themselves as susceptible to LBP, they considered that LBP would have possibly serious consequences, then they believe that a course of action available to them would be beneficial in reducing either their susceptibility to or severity of the condition, and believe the predicted benefits of taking action outweigh the barriers to (or costs of) action, they are likely to take action that they believe will reduce their risks to LBP (Haden 2017:59).

It contains different primary concepts that predict why people will take action to prevent, to screen for, or to get treatment for LBP. These constructs are discussed in the following subsections accordingly.

3.5.1 Perceived susceptibility

Perceived susceptibility or individual risk is the belief that the individual perceived the likelihood of acquiring or being affected by LBP is high. This is the most powerful perceptions in promoting people to adopt or practice health promoting behaviours. The higher the perceived risk factors of LBP, the greater potential of engaging in behaviours to decrease

the risk factors. It is only logical that when people believe that they are at higher risk for LBP, they will be more likely to do something to prevent it from happening. Unfortunately, the reverse is also true as: when individual's belief they are not at risk or have a low risk of vulnerability to LBP, health jeopardising behaviours tend to be practiced (Shumaker, Ockene & Riekert 2009). For example, an individual must believe that there is a possibility of being diagnosed with disc prolapse before she/he will be interested in obtaining MRI scan of lumbar spine.

3.5.2 Perceived severity

The construct of perceived severity relates to one's beliefs about the seriousness of developing LBP. This is often based on prior medical knowledge or information; it may also follow from beliefs the individual has about the impacts that LBP might individually have on him or her. The perception of severity can also be coloured by previous experience of LBP (Haden 2017:60). For example, the physician will tell the patient how severe LBP is in relation to pain and suffering, family and social crisis, premature disability, effects on work, etc.

The combination of perceived susceptibly and severity results in *perceived threat*. It means that some sort of fear that motivates the individual to look for possible preventive measures to combat LBP. If the perception of threat relates to a serious disease for which there is a real risk, behaviour often changes. Individuals changed their behaviour based on the perception of threat of LBP. The probability of health behaviour changes occurs in their diet, exercise, and weight. Occasionally, the perceived benefits are not deceptive at the initiation of the prevention strategy. At the initiation of the programme, there might be doubt regarding to the benefit of the programme. The perception of increased susceptibility does not permanently lead to behaviour modification, nor does a perception of increased threat to LBP (Haden 2017:60).

3.5.3 Perceived benefits

The construct of perceived benefits refers to the possible factors that the patient regards as value or usefulness that comes from adopting the recommended health behaviours in decreasing the risk of developing LBP. Individuals tend to adopt health promoting behaviours when they perceive that the new behaviour will decrease their chances of developing LBP (Champion & Skinner 2008:45). Perceived benefits play a critical role in the adoption of

primordial prevention strategies of LBP. For example, the patient could perceive preventing occurrence of LBP as a benefit of adhering to the new treatment strategies.

3.5.4 Perceived barriers

Perceived barriers are the potential negative factors of a specific health action that the back patients may take as impediments to undertaking recommended health promoting behaviours. It is the most important constructs in the determining of behavioural changes. To adopt the new behaviour, an individual need to believe the benefits of the new behaviour offset the consequences of continuing the old behaviour. Here, the back patients may perceive some potential losses that follow to the adoption of new recommended health promoting behaviours. For example, treatment costs, loss of jobs, fear of attending social events and gatherings due to LBP might influence sufferers to use the recommended prevention strategies (Champion & Skinner 2008:45).

3.5.5 Modifying variables

Modifying variables are those individual factors that affect or alter whether the new behaviour is adopted or not adopted. They are grouped under three categories: *demographic*; such as age, gender, marital status, educational level, and ethnicity; *psychosocial*, such as income, owning of house, culture, and personality; and *structural*, such as knowledge, skill, past experience, and access to healthcare system (Haden 2017:61).

3.5.6 Cues to take action

Cues to action relate to an individual's readiness to take immediate action by perceiving susceptibility and the perceived benefits. This can be integrated by bodily events, people, things, or environmental measures that triggers the adoption of the recommended health promoting behaviours. For example, illness of a family members, magazine, newspaper, advice from others, or reminder postcards from a healthcare provider will advocate to take an immediate action in order to prevent or treat LBP (Haden 2017:62 & Champion & Skinner 2008:45).

3.5.7 Self-efficacy

Self-efficacy is the ability of the individual to successfully perform health promoting behaviours required to produce the outcomes. If someone is confident in his/her skill and the benefit that the recommended behaviour brings, the individual will perform and maintain it consistently. In general, individuals did not try to do something new except when they thought they had the ability to effectively perform that action. If someone considers a new behaviour is useful (perceived benefit) but does not think he or she is proficient of doing it (perceived barrier), likelihoods are that it will not be tried (Haden 2017:62). For LBP, exercise self-efficacy and exercise barriers are the strongest predictors of whether one practices behaviours known to prevent or treat this disorder. Individuals who do not engage in the recommended levels of exercise tent to low exercise self-efficacy, meaning they do not believe they can exercise, and perceive that there are significant barriers to attend an exercise programme (Jack, Grim, Gross, Lynch & Mclin 2010:57).

These constructs assist the researcher to develop a culturally sensitive preventative model by encouraging health promoting behaviours. The perceived barriers are the most important predictor for health promoting behaviours. Although both perceived susceptibility and benefits are important for the predictor of preventive strategies for the complex phenomena of LBP (Haden 2017:63). The components and linkages of health belief model is presented in the following diagram.
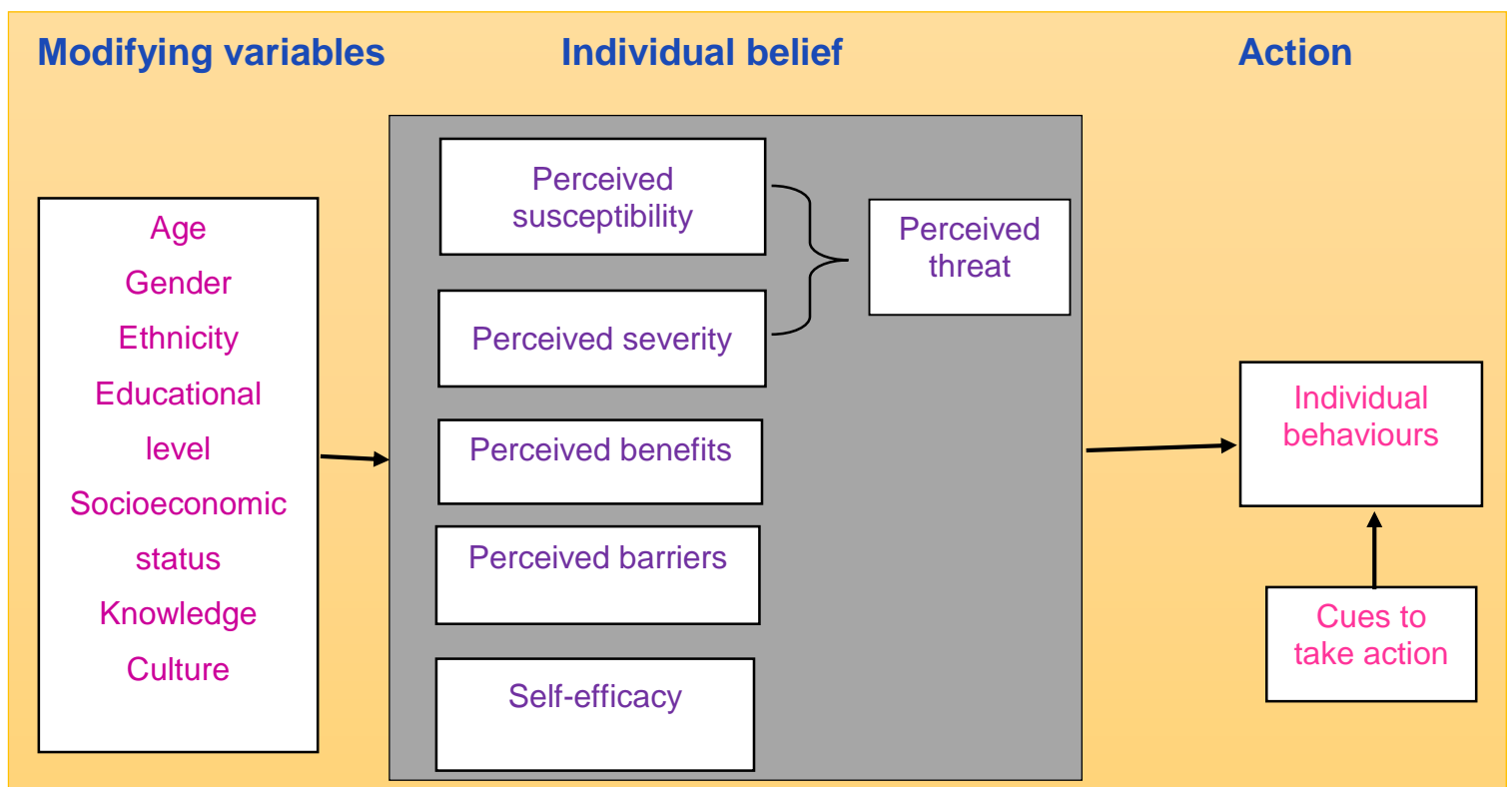
Figure 3.3 Health belief model: components and linkages

The model identifies the basic fundamental logical constructs and central beliefs that lead to the recommended behaviour of interest. It also provides theoretical framework to categorise and measure outcome expectancies of preventive services. However, the relationship between these constructs is not well understood (Brewer & Rimer 2008:152). There is also variability to measure it's constructs across different study of interests, culture, and study population. It uses only few standard questions to assess the key constructs of this model. In addition to this, the model relies only on cognitive constructs of behaviour and does not consider the emotional constructs of behaviour (Champion & Skinner 2008:45). By considering these mentioned drawbacks, the researcher presented the application of this model in the study as follows.

3.5.8 Application of the health belief model in the study

The fact that the study is heavily focussed on the influence of cultural beliefs on the development of LBP appropriately aligns with the HBM. The HBM was introduced as a theoretical framework within the study to assist in developing a clear understanding of the

research questions. The framework was used to determine the relationships between health beliefs and behaviours, as well as to inform prevention intervention. Likewise, it is also used to investigate why people failed to undertake preventive health measures in order to prevent LBP. It also used to guide for the development of a culturally sensitive preventative model for the prevention of LBP. The model focused mainly on the health promoting and health jeopardising behaviours; therefore, it was most suitable for addressing problems occurred due to maladapted behaviours.

In order to apply the model for this research project, the researcher should focus on the understanding of how susceptible the target population are, whether they believe LBP is serious or not, and whether they believe action can reduce threats within acceptable costs. The model proposed that perceived risk factors of contracting LBP, perceived severity of LBP, and perceived benefits and barriers to the available prevention strategies of LBP are necessary to be investigated with a new approach. Therefore, this model is used in this study to identify the specific factors that influence the occurrence of LBP. The application of health belief model for the study is illustrated in the diagram below.

Demographic variables
(age; gender; marital status;
educational level; ethnicity; etc.)

Psychosocial variables
(religion; culture; income; type of
house; area of living; lifestyle; family;
friends; group pressure; etc.)

Perceived benefits of preventing LBP
(exercising; availability of treatment; traditional
diet; avoid alcohol; avoid cigarette; etc.)
Minus
Perceived barriers to take actions (low
motivation; apathy; low priority; lack of self-
control; lack of reliable information; lack of
support; no time to exercise; etc.)

Likelihood of making
efforts to maintain healthy
promoting behaviours or
prevent LBP

Perceived susceptibility
(definition of LBP; genetics; family
history; physical health status;
wearisomeness; belief on movement;
cultural view of pain; etc.)

Perceived Threat of
developing LBP

Perceived severity
(life threatening; feeling depressed;
belief on endangered; restricts
activities; physical limitations;
hopelessness; etc.)

Cues to take action
(keep ideal weight; balanced diet; getting good
sleep; understand good posture; illness of
family members; mass media; exercise
programme; lack of energy; pre-existing health
conditions; physician recommendations; etc.)

Self-efficacy
confidence in ability to sustain a
prevention programme (Exercising
lift weight with precautions;
spiritual life; need credible
information; social support; etc.)

Figure 3.4 Application of the HBM for the exploration of the influence of cultural and social factors in vulnerability to LBP: *reproduced from Haden (2017:69)*

3.6 KEY CONCEPTS OF THE THEORETICAL FRAMEWORK

The theoretical frameworks of the study provided the basis for the development of data collection instruments. The bio-medical model and six constructs from health belief model guided the development of the survey tool for the study. Socio-demographic, lifestyle and work-related components of the bio-medical model identified the associated risk factors of LBP. Similarly, the psychosocial factors from this model denoted to ascertain the psychosocial factors and impacts of LBP. The psychological and socio-cultural components of the biopsychosocial model identified the influences of cultural and social factors in vulnerability to LBP. Additionally, the two models assist the researcher to explore the bio-medical and culture based modifiable risk factors of LBP. The pain theories explain the rationale for the need of understanding the severity and pathophysiology of LBP. The six constructs of health belief model offer an in-depth exploration of the influence of cultural and social factors in vulnerability of LBP. Summary of an application process for the theoretical framework of the study is provided in table 3.2 below.

Table 3.2 Summary of the application of different models in the study

Models	Component of models	Application to the data collection instruments
Bio-medical model	Socio-demographic, lifestyle and work related factors	To identify factors associated with LBP
	Psychosocial risk factors	To identify psychosocial factors
Biopsychosocial model	Psychosocial and socio-cultural components	To assess the influence of socio-cultural factors
Pain theories	Get control theory	To understand the severity of LBP
	The neuromatrix theory	To ascertain the severity of LBP
Health belief model	The six constructs of the model	To explore the modifiable bio-medical and cultural factors and the influence of culture on the development of LBP

3.7 SUMMARY

This chapter presented the theoretical models that the study was founded on. All the important models and theories that were utilised within the study process were outlined in detail. In order to develop an appropriate culturally sensitive preventative model, exploration of the influence of cultural and social factors in vulnerability to LBP is crucial. This process was guided by a theoretical framework.

A theory-driven research provides a consistent ground for valid and rigorous development of the preventative model. This preventative model can be developed based on the constructs of three models. The bio-medical and health belief models are filled with different constructs in order to guide the development of the data collection instruments for the study. The gate control and neuromatrix theory of pain explain the rationale for the need for different approaches in the severity and impacts of LBP. These theories enabled the researcher to present a comprehensive understanding of the phenomenon of LBP and to compare findings with other similar studies.

CHAPTER 4

RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

In the previous chapter, the researcher dealt with the general concepts of theoretical frameworks and elaborated on the chosen models for the study. The chapter involved the discussion and rationalisation of employing the bio-medical model, biopsychosocial model, and pain theories. Finally, the chapter focused on the chosen model for this study; health belief model with its conceptualisation with the development of low back pain.

This chapter presents the research methodology in relation to the research paradigm, research design, and the phases of the study. The chapter further discusses in-detail, the researcher's philosophical assumptions, stances and methods followed to answer the research questions. The research design section of the study is discussed in relation to the use of an explanatory mixed method design. Consequently, the study population, sampling techniques, data collection processes, data quality management and analysis, and ethical considerations will be discussed.

The study presentation is organised according to the phases of the study. Phase one of the study is quantitative, in which the survey was used as a data collection instrument. Whereas, phase two of the study is qualitative, which utilised interviews as the data collection tool. Finally, the findings of the two phases were interpreted and integrated in the third phase of the study by considering the academic rigour and interventions taken to maintain the scientific integrity of the research.

Research is an organised inquiry that employs suitable systematic methodology to solve problems and generate new pertinent knowledge (Ranjit 2014:9). This study uses a mixed methods approach in order to collect and analyse data. This is guided by pragmatist philosophical assumptions that shape the researcher to find out appropriate methods to answer the research questions.

4.2 RESEARCH PARADIGM

A research paradigm is an integrated system of thinking and interconnected practice that describes the nature of a scientific inquiry (Blanche & Durheim 1999:147). According to them,

the research paradigm has four basic components. These are ontology, epistemology, axiology and methodology. The researcher assumptions are within the domain of nature of reality to answer the research questions (ontology) and producing an acceptable knowledge that can be obtained from the observable phenomena (epistemology). Thus, the researcher's role of values in the research (axiology) and research questions and use of appropriate methods in a systematic inquiry (methodology) are under the paradigm scope (Neuman 2014:94).

The research paradigm governs the researcher on how he sees the world and how he structures his thoughts about what he observes in the world (Creswell 2014:5). This study relies on the ontological and epistemological assumptions (Neuman 2014:93). Here, it is important to discuss about this assumptions in-detail in order to have a clear understanding of which assumptions fit for the study. The diagrammatic summary of this chapter is presented in figure 4.1 below. The components of the diagram are discussed in-detail in the following subsections.

4.2.1 Ontological assumptions

The ontological assumptions are philosophical views that deal with the fundamental of the nature of reality or the issues related to what exists. There are two basic positions within this assumption: the realist and nominalist. The realist sees the world as being about what is out there. It assumes that the actual world exists independently of humans and their interpretations of it. There is a clear demarcation between the researcher and the problem under investigation. However, the nominalist assumes that humans never directly experience natural reality. The researcher experience with what he calls the actual world is always occurring through a lens or structure of explanations and inner subjectivity (Neuman 2014:94). For this study, the researcher's stance was on realist and nominalist ontological positions as the socio-cultural factors greatly shape all of his experiences within physical, social, and cultural world.

RESEARCH PARADIGM

Ontology

Realist

Nominalist

Epistemology

Pragmatist

Positivist

Post-positivist

Constructivist

Transformative

Research Design

Analytical cross-section

Explanatory sequential design

Phenomenological

Quantitative

Mixed

Qualitative

Data collection methods

Questionnaire

Interviews

Deductive

Data analysis approaches

Inductive

Exploring relationships: univariate; chi-square analysis and correlation

Thematic analysis: guided by the QUANTITATIVE findings

Figure 4.1 Diagrammatic presentation of the research methodology

4.2.2 Epistemological assumptions

The epistemological assumptions relate to issues of how the researcher knows the world around his surrounding or how he knows about what is true. Epistemology includes what the researcher needs to do to produce knowledge and what scientific knowledge looks like once learned, produced and communicated. The researcher can produce new knowledge deductively by testing pre-existing ideas and conjecture about reality against empirical data. He can also work inductively to gather and organise empirical evidence into higher order generalisation. Working inductively and deductively over time can distinguish true from false ideas with respect to the broad areas of reality (Neuman 2014:94).

In this study, the researcher mixes the elements of different epistemological paradigms that are evolving positions to observe, measure, and understand the reality about LBP. Thus, the truth of LBP is influenced by positivist, post-positivist and constructivism paradigms (Neuman 2014:96). The next subsections discuss the paradigms utilised within the study , along with the philosophical assumptions and the researcher's stance on these approaches.

4.2.2.1 Positivist research paradigm

The positivist paradigm is the only way to establish truth and objective reality. Positivism is founded on the view that science is the single basis for real knowledge. Positivist researchers concluded that if the scientific methods do not yield any visible outcomes on the nature of reality, then reality does not exit. Knowledge can be generated by using the scientific methods. A deductive approach is undertaken with the focus of testing hypothesis. There is a single and tangible reality, which is relatively constant across time and setting (Chilisa & Kawulich 2015:7).

Positivists believed that research relies solely on observations and measurements (Rahi 2017:2162). They assumed that the methods, techniques, and procedures followed in the research world offer the best framework for investigating the research problem. This often involves random samples, controlled variables, closed-ended questions, standardised sampling tests and data analysis procedures. Observations related to this concept can be generated through the senses of sight, smell, taste, touch, and hearing. This viewpoint gives low credibility to issues such as people's attitudes and thought; none of which are accepted

as valid evidence and knowledge. Then an intellectual rigour of a positivistic paradigm is measured by means of reliability and validity (McGregor & Murnane 2010:420).

In this study, the researcher and the research questions to be answered are different entities. Neither of them impacts the other. The researcher is not permitted to replicate his personal views and emotional feelings instead, they must remain distant from the research processes. This would empower the researcher to undertake the character of a neutral analyst and making separate interpretations about the data that have been collected via this assumed value-free method.

4.2.2.2 Post-positivist research paradigm

The post-positivism paradigm started in the 1965 as a way of knowing aside from utilising the systematic method. Post-positivism generates knowledge and falsify theory using an inductive reasoning approach. It denies the perspectives of positivism and operates to understand why people behave in the manner that they do. There is position for the voice and role of the researcher and participants in the study. Within this critical realist paradigm, research should conduct in the natural settings rather than in the experimental laboratories. The interest is to search for implications in definite social and cultural contexts rather than for general settings. For this purpose, neither the participants nor the researcher can persist neutral (McGregor & Murnane 2010:426). In this study, the researcher used questionnaire and interviews to collect the data. The final conclusion is trustworthy because the researcher justified his perspectives and findings for the reader.

4.2.2.3 Constructivist or Interpretivist research paradigm

The constructivist paradigm is related to concepts that addresses understanding of the world as others experience it. They believed that reality is socially constructed phenomena and there are out there many intangible realities as there are people constructing them. Statements regarding what is true and false are bounded by culture, history, and context (Creswell 2014:8). There are individual realism and group-shared realism. The researcher interest should be focused on how these assumptions about nature of realism is constructed into the research process. The researcher is inevitably influenced by their values, which inform the paradigm to choose for the inquiry. In this paradigm, the research questions may not be well-known before the study begins but rather developed as the study progresses.

The research questions are open-ended. The best example are the grand tour questions that examined the general issues of LBP (Chilisa & Kawulich 2015:10).

In this study, the researcher used best approaches within the constructivist research paradigm. He understands that the participants have lived experiences on LBP. Further, a deep knowledge about LBP could be obtained by deeply investigating the experiences of the participants.

4.2.2.4 Transformative research paradigm

The transformative research paradigm is a group of research designs influenced by different scholars and theories with a common theme of transforming societies through group action. This is where the scholars criticise the positivist, post-positivist, and constructivist theoretical stances. The paradigm also helps to explain in-detail the supremacy of Western research paradigms and marginalisation of knowledge created in other cultures (Creswell 2014:9). In this paradigm, true knowledge is collected from the participants' frame of reference. The relationship between the researcher and participants involves a transformation and emancipation basis. The researcher's able to answer the research questions by reflecting and examining their principles to secure that they are essential for conducting the study (Chilisa & Kawulich, 2015:12).

For this study, the main objective of the inquiry utilised this worldview is to address the myths, illusions, and false knowledge about LBP. The quantitative phase of the study was used to investigate the surface realities about the key bio-medical and culture based modifiable risk factors of LBP and the qualitative phase was used to explore in-depth the influence of cultural and social factors in vulnerability to LBP.

4.2.2.5 Pragmatist research paradigm

The pragmatist research paradigm is a worldview that arises out of situations, actions, and consequences rather than antecedent conditions. They explain that reality does not exist only as natural and physical reality, but also as a psychological and social reality. The nature of reality is not exposed by using either a quantitative or qualitative research approach or not based on the philosophical assumptions or stances as the researcher has followed (Rahi 2017:2162). Instead of concentrating on methods, the researcher underlines the research

problem and use of all available methods to understand the problem (Creswell 2014:10). Pragmatists link their selected methods directly to the objectives of and the nature of questions posed.

The pragmatist paradigm is a spontaneous application, implementing methods that are suitable, permission to study settings, and using findings in a positive means in congruence with the nature of reality held by the researcher (Armitage 2007:3). The main aim of utilising this paradigm is to find out the weaknesses of one method and to strengthen it by mixing different approaches (Rahi 2017:2162). The transferability of knowledge is more vital than the production of knowledge. Using Creswell (2014:10) views, pragmatist offers a philosophical foundation for the research as:

- Pragmatists are not only dedicated to one system of philosophical assumptions and reality.
- Individual researchers have a freedom to choose the methodology of research that best fit for their objectives and research questions.
- Pragmatist researchers utilised both quantitative and qualitative data to deliver the best answers for the research questions.
- Pragmatist researcher should have established justification for reasons why quantitative and qualitative data need to be mixed in the first place.
- Pragmatists agreed that research should be always conducted in social, cultural, political, and other contexts.
- Pragmatists believed that an external world is independent from the mind as well as that lodged in the mind.
- Therefore, pragmatism opens the door for different worldviews, assumptions, and multiple forms of data collection, analysis, and interpretation.

In this study, the pragmatist paradigm created an opportunity to transform the tensions behind LBP into new knowledge through a dialectical discovery. The researcher used this paradigm in the mixed method approaches at three phases of the research. This leads to the pragmatic paradigm is more accepted and decisively implanted in this study. For this reason, it can be argued that the pragmatic paradigm can adopted for the purpose of this research activity as congruent with the mixed, quantitative and qualitative phases of the study. Indeed, this enabled the researcher to view the problem as most important as the

methods to be followed. The type of chosen paradigms in relation to reality, knowledge, research design and tools used to collect data is summarised in the following table.

Table 4.1 Summary of the research paradigms

Paradigms	Reality	Knowledge	Research Designs	Data Collection Tools
Positivism	There is one observable truth.	Knowledge is gained through hypothesis testing (deductive).	Quantitative	Structured survey
Post-positivism	There is one unobservable truth.	Knowledge is gained by testing of hypotheses (deductive).	Quantitative overweigh Qualitative	Structured survey
Constructivism	There are multiple truths.	Knowledge is gained through dialogue with people (inductive).	Qualitative	Interviews
Transformative	The reality is historical and changing.	Knowledge is gained by empowering respondents (inductive).	Qualitative	Interviews
Pragmatic	The reality is complex.	Generation of knowledge is shared by individual and environment.	Mixed (both Quantitative and Qualitative methods)	Combining survey and interviews

Source: Researcher compilation

4.2.3 Methodological assumptions

The methodological assumptions are strategies or plans of action, which are behind the choice and use of particular methods (Scotland 2012:9). A methodology is a branch of knowledge that deals with the general principles of generation of new knowledge. It determines the theoretical framework, sampling method, data collection, data analysis, and result reporting. It also used to carry out the study in a scientific approach (McGregor & Murnane 2010:420). Thus, it is concerned with what, why, where, when, and how data is

collected and analysed. It is where assumptions about the nature of realism and knowledge, values, concept, and practice on a particular research topic come together.

Research methods are the specific techniques used to collect and analyse the quantitative or qualitative data about the study of interest (Scotland 2012:9). It followed practical strategies to collect a valid and reliable data that enables to infer to the study population. After identifying the researchable problem and offering reasonable methodological approaches, the researcher needs to decide on the philosophical assumptions that underlie in any research (McGregor & Murnane 2010:420). The philosophical stances considered by the researcher for this study is discussed below.

4.2.4 Philosophical stances considered for the study

These categories of the research paradigm are considered ideal for this study because these categories could be utilised to conveniently place the targeted bio-medical and behavioural theories together. Furthermore, these stated philosophical assumptions are the popular paradigms in the medical, social, and behavioural researches. There is no harmony whether these paradigms are essential contrasting or whether they can be seen as contributing differently in the same study. Though, selection of the research paradigm is influenced by the identified literature, theoretical framework, assumptions about the nature of reality, and ethical principles. In this study, the researcher believed that nature of reality is complex and cannot be understood by utilising only a single research paradigm. Due to this, the researcher adapted different assumptions from each paradigm to have a full understanding of the research questions. The positivist paradigm has been used in the first phase of the study.

This worldview helps the researcher to describe the demographic profile of individuals affected by LBP, to identify factors associated with the development of LBP, and to ascertain the prevalence and severity of LBP. Furthermore, the paradigm tries to reduce the complexity of variables by classifying the risk factors into bio-medical and culture-based factors. Within this context, the purpose of the inquiry was used to discover the modifiable and non-modifiable risk factors of LBP.

The researcher thought that a perfect objectivity of inquiry cannot be achieved by utilising the positivist research paradigm only. Some risk factors of LBP might be unobservable from

the researcher stance and only become recognised when their impacts are evident. Here, the researcher is forced to rely on other paradigms to further explore the risk factors. The modified post-positivist research paradigm was presented to understand and exposed the reality behind the development of LBP. This claim is achieved through the combination of the positivist paradigm using the quantitative survey method to gather information about the influences of cultural beliefs on LBP.

Furthermore, a constructivist research paradigm was introduced to empower the researcher with a greater scope to explore the influence of culture on the development of LBP. This claim is achieved through using the qualitative methods to gather a broader information outside the readily measurable variables. In addition to this, the transformative paradigm assisted the researcher to explain in-detail the supremacy of Western prevention strategies and marginalisation of knowledge created in other cultures are not suitable for culturally different Ethiopia. The prevention of LBP should be within the social, cultural, political, and power grounded country. This must be complemented by utilising a detailed explanation of the modifiable factors and influence of culture on the development of LBP by healthcare providers. For this purpose, the culturally sensitive prevention model was developed as a mandatory tool to prevent the occurrences of LBP.

Finally, the pragmatist paradigm assisted the researcher to mix different research methods for the collection, analysis, and interpretation of the data. This empowered the researcher to have a broader understanding for the research problem by exploring the mystery's behind development of LBP. As a philosophical underpinning, LBP is a complex musculoskeletal disorder, which needs utilisation of multiple enquiries to understand its occurrence. Due to this reason, the pragmatist paradigm is the last philosophical stance used by the researcher. This might emphasise the generation of inter-subjective knowledge from the perspectives of back patients and healthcare providers.

4.3 RESEARCH DESIGN

4.3.1 Definition

The research design is a logical roadmap of research methods. It shows philosophical assumptions how the study could be conducted and procedures on how data is collected, analysed, and interpreted (Neuman 2014:308). It is considered as a strategy that the

researcher should follow to answer the research questions. In addition to this, it should be stated clearly with great care as any error in it might distorted the entire study. Thus, a design that provides maximal explanation and opportunity for observing many different features of problem is considered most suitable and capable design. The questions of good design are related to the objectives of the study and nature of the problem under investigation. One single design cannot be suitable for all types of research problem. There is no perfect and superior research design over the other (Kothari 2010:33).

In order to identify answers for the research questions, data was collected and analysed sequentially. It involved a three-phase project in which the researcher collected quantitative data in the first phase, analysed the results, and then used the results to plan the second, qualitative phase. The researcher attempted to have a numerical data to describe the modifiable and non-modifiable risk factors of LBP. This was followed by a qualitative study, where this enabled him to explore, understand, describe and interpret the influences of culture on the development of LBP and explore in-depth the modifiable risk factors of LBP. It had also the ability and purpose to represent the views and perspectives of the participants regarding the phenomenon of LBP (Yin 2011:3-8). There are three types of research designs that the researcher used. These are analytical cross-sectional, phenomenological and sequential explanatory research designs. The following subsections outlined important points on these designs.

4.3.2 Analytical cross-sectional design

In the first phase, analytical cross-sectional design was used to address the study objectives. This design is relatively cheap, less time consuming, and simple approach. The quantitative data is gathered once at a point in time based on their exposure to LBP. Consequently, the data collection instrument should be well developed to gather information on both the risk factors and LBP at the same time, retrospectively. Certainly, it is difficult to establish a cause and effect-relationship between the identified variables (Creswell 2009:211).

The analytical cross-sectional design was chosen because the researcher wanted to look for relationships between variables, with the aim of establishing associations or cause and effect relationships. The first phase of the study was used to describe the demographic profile of individuals affected by LBP and to identify factors associated with the development of LBP,

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to ascertain the prevalence, severity, and impacts of LBP, and to assess the influence of cultural beliefs on the development of LBP among back patients.

The bio-medical and culture based modifiable risk factors of LBP were generated as part of the process of the development of a culturally sensitive integrated preventative model.

4.3.3 Phenomenological approach

The second phase of the study was anticipated to explore the influence of cultural and social factors on the development of LBP. The researcher selected the phenomenological approach as it allows an exploration of the influence of cultural beliefs on the development of LBP based on the lived-experiences and expert knowledge of the participants. The researcher believed that the phenomenological approach provided the ideal opportunity for this study. The researcher gathered data from back patients who had experienced LBP and healthcare providers who had extensive clinical experiences on the management of LBP cases with the aim of preparing complete descriptions of how LBP is developed.

Phenomenology is a form of qualitative research in which the researcher attempts to explore the lived experience. The aim of this approach was to deepen understanding of the meaning or nature of human daily lives. The collected data gave rich descriptions on the development of LBP from different perspectives. The back patients were selected based on their prior diagnosis for LBP and clinical experiences and expertise knowledge was utilised to selecet the healthcare providers (Hole 2016:168-169).

The researcher selected a phenomenological approach for five reasons. First, the development of LBP is complex and has multifactorial origin. Second, the topic needs further deeper exploration, because risk factors of LBP are not easily identified, theories are not available to explain the behaviour of back patients, and theories need to be developed based on their lived experiences. Third, the researcher anticipated a detailed view of the influence of cultural beliefs on the development of LBP due to that a quantitative or distant panoramic shot will not sufficient to present answers to the research questions. Fourth, the researcher wanted to study the participants in their natural environment. Finally, the researcher was interested in writing in a literary style, acting as an active learner and wanted to present the findings from the participants' view in a diagram form (Creswell 1998:17-18).

4.3.4 Explanatory sequential mixed method design

The research design for this study is an explanatory sequential mixed method design. The sequential approach makes the study relatively simpler and facilitates its implementation, description, and reporting (Creswell 2003:216). Creswell (2009:207) indicates that the overall advantage of this design was that the qualitative data helped to explain in more detailed the initial quantitative findings. At the end, the pertinent findings of the two phases of the study were integrated to validate the findings that were used to develop the culturally sensitive integrated preventative model. The summary of the three phases of the study is illustrated in the following diagram.
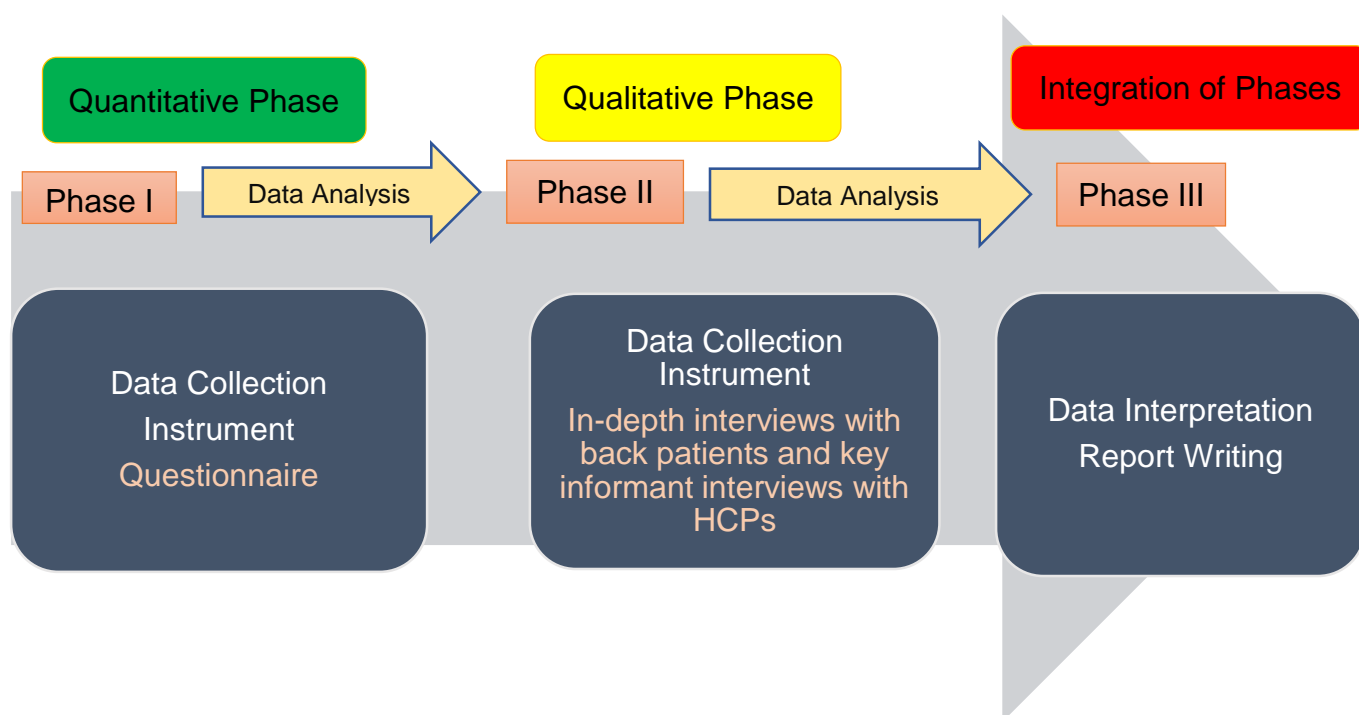
Figure 4.2 Diagrammatic presentation of the sequential phases of the study

The implementation of the study was sequential, where the quantitative data was collected using a questionnaire and then proceeded to the collection of the qualitative data utilising in-depth interviews and key informant interviews. The detailed descriptions from the qualitative phase of the study added meaning to the numbers collected during the quantitative phase (Creswell & Clark 2011:185). Furthermore, the qualitative data collection process entailed

the non-statistical organisation of the cultural beliefs and lived experiences of back patients and clinical knowledge of healthcare providers (Cornwell 2009:15).

In order to address the challenges faced during utilisation of this design, the researcher invited experts in the field of back pain (Neurologist, Orthopaedist, Neurosurgeon, and Physiotherapists). In addition to this, a statistician, language editor, data collectors and an experienced researcher were invited to strengthen the integrity of the research. The project might be impacted by the expenses and consumption of time. For this problem, the researcher considered making provision for adequate data collection period, for three-months and data collectors. Furthermore, the researcher used an explanatory sequential design to minimise the drawback of other study designs.

4.4 PHASE I: THE QUANTITATIVE RESEARCH

4.4.1 Introduction

The researcher decided on the most appropriate research methods in order to answer the research questions. As noted in the previous sections, the researcher preferred a sequential explanatory mixed method design to address the research objectives and questions asked at the beginning of the inquiry. As mentioned earlier, quantitative research deals with the numerical data to measure, proof and establish cause and effect relationship between variables. It usually starts with the hypothesis and ends with proof or disproof of the perceived knowledge (Ellis 2010:10). As illustrated in figure 4.2 above, this quantitative phase of study was followed by qualitative phase. In the first phase of the study, positivist approach was employed to describe the demographic profile of individuals affected by LBP, to identify factors associated with the development of LBP, and to ascertain the prevalence and severity of LBP.

The quantitative phase was founded on the positivist paradigm. This positivist paradigm followed the constructs of the HBM. The model helped to identify some important bio-medical and culture based modifiable factors of LBP, which can be used as variables to develop the preventative model. In general, this quantitative research had three important purposes: (1) to describe the demographic profile of individuals affected by LBP, ascertaining the prevalence of LBP, estimating severity and impacts of LBP and identifying associated risk factors of LBP, (2) to inform the participants for the qualitative phase of the study and (3)

lastly, to integrate relevant results of the two phases of the study.

Below are some discussions on the specific features of the 1st quantitative phase of the study. Some aspects and related issues were included and discussed in-detail and these were, the research setting, the study population, sampling techniques, sample size determination, inclusion and exclusion criteria, accessible population, data collection methods, and data analysis.

4.4.2 The research setting

The researcher selected Addis Ababa public hospitals as a study setting due to four reasons. Firstly, the most frequently used health facilities (38.87%) for outpatient care are public hospitals. Secondly, the main provider of outpatient services (52%) for chronic medical conditions like LBP are public hospitals. This is further explained as patients suffered from LBP are utilising the hospitals instead of health centres or health posts. Thirdly, public hospitals are used by a larger proportion of individuals living in rural areas (78.37%) than individuals residing in urban areas (59.28%). This enables the researcher to get data from majority (84%) of Ethiopia rural populations. Finally, the highest percentage (10.06%) of non-communicable diseases are reported in Addis Ababa (NHA 2014:36-43). Based on these facts, Addis Ababa public hospitals are the most convenient place to conduct this study.

Addis Ababa is located in the heart of the country. It has a total land area of 540 square kilometres, which lies between 2 200 and 2 500 meters above sea level. It is the capital city of Ethiopia. Based on the 2017 health and health related indicator of Federal Ministry of Health, the region has an estimated total population of 3 273 001 consisting of 1 551 000 males and 1 722 001 females (M/F ratio: 0.90). The total fertility rate is 1.5% and the life expectancy is 54.1 and 55.8-year for male and female, respectively (FMoH 2017:11-12). The major ethnic groups are Amhara (48.3%), Oromo (19.2%), Gurage (17.5%), Tigre (7.6%), and others (7.4%). Regarding to religion, 82.0% of the population are Orthodox Christians, 12.7% Muslims, 3.9% Protestants, and 1.4% followers of other religions.

According to the 2010 Federal Ministry of Health report, Addis Ababa has 11 public hospitals, 96 health centres, 28 private hospitals and 882 clinics. The public hospitals are managed by three governmental organisations: Addis Ababa University, Addis Ababa Regional Health Bureau and Federal Ministry of Health. Addis Ababa University (AAU) manages Tikur

Anbesa Hospital and Addis Ababa Regional Health Bureau (AAHB) currently controls six hospitals, which are Zewditu Memorial Hospital, Gandhi Memorial Hospital, Yekatit 12 Hospital, Minilik II Hospital, Ras Desta Hospital and Tirunesh Beijing Hospital. However, St. Paul Millennium Medical College, St. Peter TB specialised Hospital, ALERT centre, and Amanuel Psychiatry Hospital are accounted to FMOH (Seid, Tesfaye, Abate, Mohammed, Lemma, Tamiru & Almeayehu 2016:16). This study was conducted in these listed 11 public hospitals. The selected public hospitals were accessible (located within 20km radius) and thus being cost effective for the researcher. The accessibility of the research sites was also possible as the researcher is directly involved in the services that is provided in outpatient setting. Figure 4.3 below shows the map of Addis Ababa and the specific locations of the eleven public hospitals.
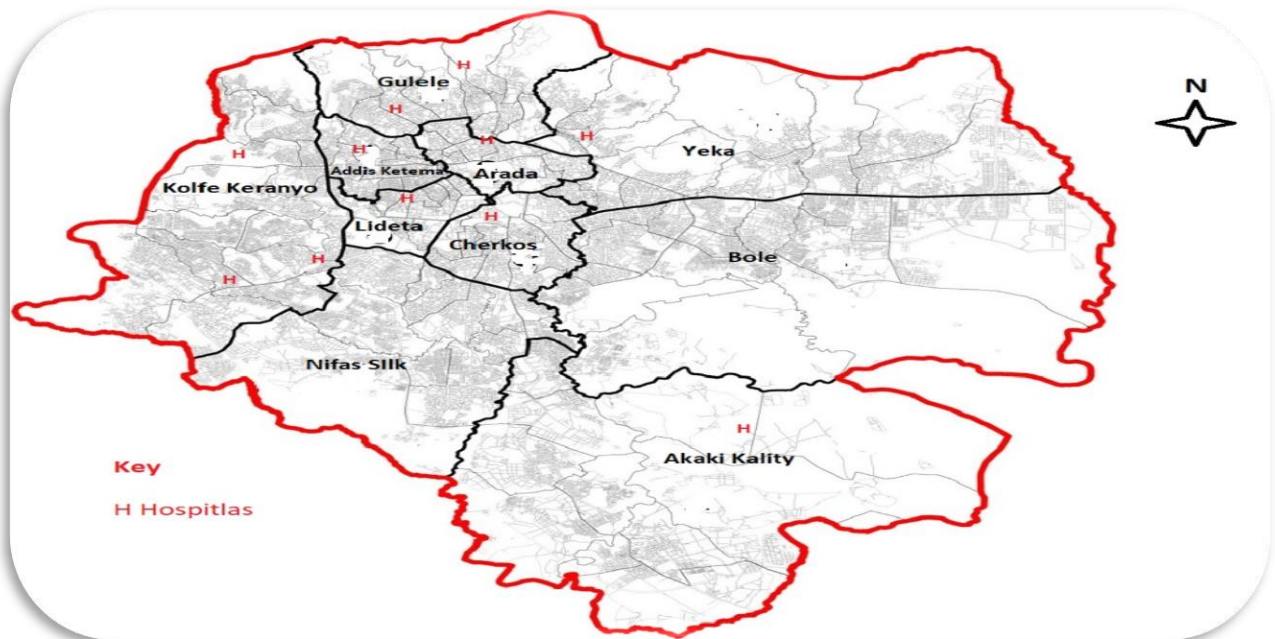
Figure 4.3 Map of Addis Ababa and location of public hospitals

The next section will discuss about the study population, sampling, and sample size based on the public hospitals that are found in Addis Ababa.

4.4.3 The study population

Population refers to all individuals of interest to the researcher. The target population is a set of members of participants in which generalisation will be made (Pandey & Pandey 2015:40-

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43). A study population is the group that is studied either in total or by selecting a sample of its members. The study population are whom the data collection was conducted to gather information to find answers to the research questions. Sample is a smaller collection of units from a target population used to determine truths about that population (Neuman 2014:94-96).

In this study, the target population includes all back patients who were attending clinical services in all public hospitals of Addis Ababa. Among these populations, back patients who were attending outpatient clinical services in the selected public hospitals were considered as a study population. In order to say the selected samples are representative then the sample should be adequate in size, selected by a well stated sampling procedure, and must offer full response (Hesse-Biber 2010:49). Otherwise, the process that used to select sample from the target population may affect the quality of the study. In order to minimise this problem, the researcher used sampling techniques. The following sections tries to discuss concepts related to sampling techniques.

4.4.4 Sampling techniques

Sampling refers to procedures of selecting a required number of participants from a well know population as a representative of that population (Pandey & Pandey 2015:40-43). The researcher used sampling to develop inferential conclusion about the population from a sample. There are two types of sampling techniques: random and non-random sampling technique. Random sampling technique is the way that used to select the most powerful sample from the target population (Vaus 2002:71).

For this study, the researcher employed systematic random sampling technique in order to select the participants. Systematic sampling techniques is a 'mixed' method of sampling that the first unit is selected by using random samples and the next samples are selected automatically by prearranged sequence (Ranjit 2011:190). The sample is obtained by dividing the total number of participants by number of sample. The result is used as the sampling interval (k^{th}) from which to pick sample from the list. Once the starting sample is determined randomly and the list of the sample does not have a pre-established, non-random order, this method of sample selection is known as systematic random sampling technique (Panacek & Thompson 2007:75). This is a good sampling method to reduce systematic error

by avoiding complexity of the research method. In this study, simple systematic random sampling technique was employed to represent all segments of the sample by considering homogeneity of the study population in relation to the study of interest. Homogeneity means that the study population had similar conditions (LBP) and they were attending outpatient clinical services. There were six steps to reach the study unit to whom the questionnaires were administered is illustrated in figure 4.4 below.
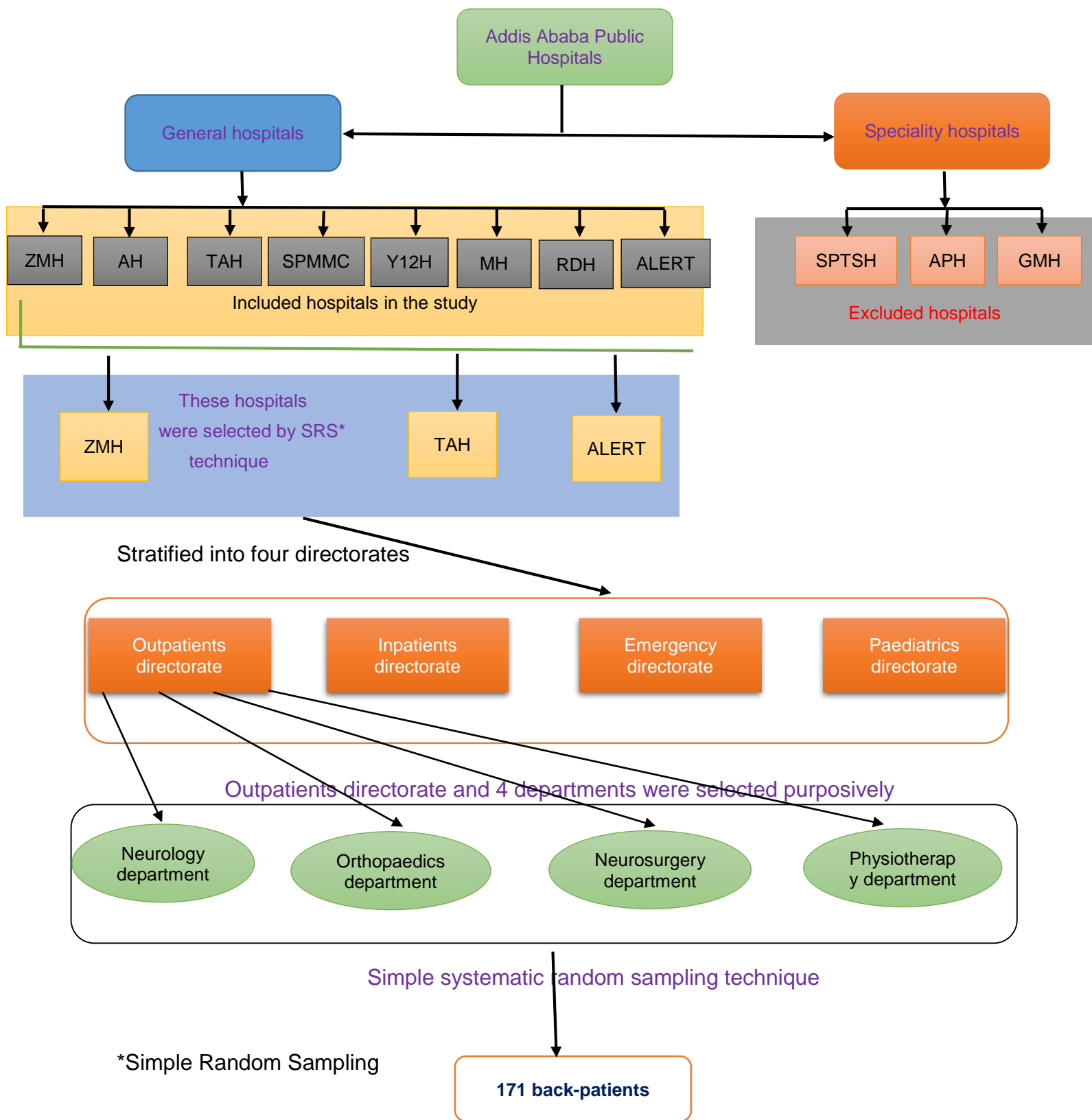
Figure 4.4 Steps in the selection of participants in the quantitative phase

These steps used to follow to select the study subjects were:

1) Dividing the hospitals as general and specialised hospitals based on the services they provided for patients. There are eight general public hospitals and three specialised public hospitals. Based on this, three hospitals were excluded from the list.

2) Employing simple random sampling techniques to identify the hospitals that represents the public hospitals. Among the remaining eight public hospitals, three hospitals (37.5%) were selected. The selected hospitals were stratified into four directorates as outpatient, inpatient, emergency, and paediatrics.

3) Employing a purposive sampling technique to select outpatient directorates that are represents each public hospital. This is due to that the primary focus of this research was to collect and analyse data on the back patients.

4) Employing purposive sampling technique to identify outpatient departments where back patients were attending clinical services. The researcher used the already functioning departmental classifications for stratification and accessing the back patients to ensure representativeness of the sample.

5) The total sample size required was allocated proportionally to each of the selected public hospitals.

6) Back patients found in each of the selected outpatient departments were reached and interviewed.

In total, three (37.5%) public hospitals were randomly selected and included in the study. The sampling units were the lists of back patients that were found in each department. The study units were back patients. The first participant was selected by utilising a lottery method after calculating the sample interval using an equation of $k^{th}=N/n$. After randomly selecting the first sample, the researcher selected the consecutive subjects by adding each case intervals.

4.4.5 Sample size determination

In order to select the samples from the study population, the researcher has employed simple systematic random sampling technique. The sample size was calculated using a single population proportion formula for the cross-sectional survey as indicated below:

$$n = \frac{Z_{\propto}^2 \, p \, (1-p)}{d^2} \quad = \frac{(1.96)^2 \, 0.17 \, (1-0.17)}{(0.05)^2} \; = \; \mathbf{216.8} \approx \mathbf{217}$$

Where,

n is the required minimum sample size,

Z is a standard statistic for 95% level of confidence (CI),

p is an expected prevalence or proportion of LBP (in proportion of one; 16.7%, P= 0.17 (El-Sayed et al 2010:5)), and d is the margin of error or precision and taken to be 5%.

According to the 2018 Federal Ministry of Health, Health Management and Information System (HMIS) report, nearly 450 back patients who complained LBP were attended at the follow-up clinics within six months' period. In this case, because the total population is small, the finite population correction was used according to the following formula (Bernard 2011:141):

$$n = \frac{n}{1+\frac{n-1}{N}} \qquad\qquad n= \frac{217}{1+\frac{216}{450}} = 147$$

Due to the six steps of the sampling process, a design effect five (5) was considered and the non-response rate 10% was assumed to determine the minimum required sample size. By adding design effect and non-response rate, the final sample size was **171**. One hundred and seventy-one back patients were then assumed as the sample size of the study. Further division of the sample to cover the different phases of the study was discussed in each of the phases of the study.

4.4.6 Inclusion and exclusion criteria

The researcher tried to minimise selection bias by diversifying the sample into more research sites and using explicit inclusion and exclusion criteria. These inclusion and exclusion criteria assisted the researcher to select an eligible sample that had a full potential to provide quality data in relation to the interest of the research. In addition to this, utilising firmly stated inclusion and exclusion criteria was important account for non-response rates and for specifying who the know the samples to be contacted by the data collectors were.

4.4.6.1 Inclusion criteria

Inclusion criteria are defined as the participants who fulfil the requirements of the researcher for this study. The basic criteria that were used in the inclusion criteria were demographic characteristics, clinical condition, geographic distribution, temporal setting, and informed consent (Panacek & Thompson 2007:75). The demographic parameter assisted the researcher to ensure a degree of homogeneity in the selected sample. Similarly, the clinical condition helped the researcher to focus on the sample suitable to the study. The geographical distribution limited the participants into one study area. Temporal setting helped to clarify what time the samples were available on the study sites. Finally, the participants needed to be able to offer written or verbal consent to be eligible for the study.

 Based on the above stated scenario, the inclusion criteria were:

- Back patients who were diagnosed by healthcare professionals,
- Back patients who had age greater than or equal to 18 years, and
- All consenting back patients referred for the outpatient clinics.

4.4.6.2 Exclusion criteria

Exclusion criteria are important to eliminate participants who are difficult to include in the study and may give poor quality data. It is critical to exclude individuals who are not able to give ethical consent. Individuals who have the following characteristics were excluded from this study. These criteria were:

- Back patients who were not able to give written consent,
- Back patients who were severely ill,
- Back patients who had known mental health problems, and
- Back patients who had not started follow-up services.

4.4.7 Accessible population

The accessible population are those individuals who met the sampling criteria (Botma, Greeff, Mulaudzi & Wright 2010:124) and are accessible to be included in the study. In this study, all back patients who were attending outpatient clinical services at the selected public hospitals were included in the accessible population of the study. The simple systematic

random sampling technique enabled the researcher to represent the population as closely as possible (Cornwell 2009:148). From sampled public hospitals, back patients who met the inclusion criteria were invited to participate in the study following the brief presentation of the aim of study to them. All the eligible participants were invited to complete the questionnaire. In order to achieve the minimum required sample, the researcher requested the data collectors to meet back patients who were available in the outpatient clinics. The outpatient follow-up rooms of the sampled hospitals, where used for the face-to-face interviews.

4.4.8 Data collection methods

The quantitative study usually follows a standardised protocol. The researcher used a close-ended, structured questionnaire to collect quantifiable data from the participants about the areas interest for the study. The tool was expected to gather all information that the researcher wanted to collect. The quantitative data collection phase provided numerical data that can be further tested by statistical software (Creswell 2003:18). Phase one of the study was used to analyse the bio-medical and culture based modifiable risk factors of LBP. It was primarily focused on the cultural dependent modifiable risk factors of LBP in Addis Ababa. The interviewer-administered questionnaire was used to identify the key concepts that were further explored in the second phase of the study. In the process of analysing modifiable risk factors of LBP, the data collection instrument was developed based on bio-medical and health belief models.

4.4.8.1 Development of the questionnaire

This study was firmly guided by the theoretical framework. Therefore, the development of the data collection tool followed the constructs of the bio-medical and health belief models. The researcher developed the data collection instrument based on these models. The new instrument was designed to identify the modifiable risk factors of LBP in the context of public hospitals. The questionnaire was interviewer-administered and written in English, which was not the first language of the participants. The questionnaire development process had passed six steps (Brancato, Macchia, Signore, Simeoni, Blanke, Körner, Nimmergut, Lima, Paulino & Zlotnik 2004). This is presented in the following diagram.
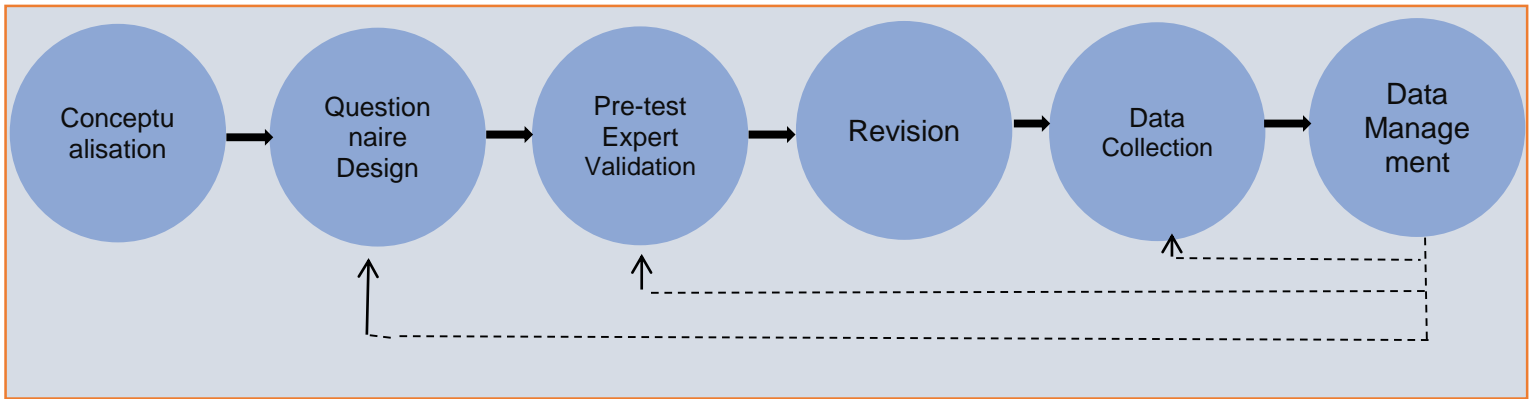
Figure 4.5 The process of development of data collection instrument

The first step in this process was conceptualisation of the research interests into measurable questions. It includes defining the participants and the variables to be measured. The study variables were formulated and guided by the bio-medical and health belief. These steps led the researcher to a quantifiable concept that could be translated into one or more survey questions. This was achieved by reviewing extensive literature and discussing the topic with relevant expert.

The second step was designing the textual version of the data collection tool. This step followed the themes that were identified during the literature search, objectives and theoretical framework of the study. Beside this, the most important variables were translated into specific survey questions and written on the paper. The questionnaire was designed and complied on an A4 paper, and it included instructions for the interviewer, information on the purpose of the study, headings above interrelated blocks of questions. In addition to this, contact details of the researcher were included in the first page of the data sheet for any queries related to the study. In order to minimise inaccuracies arising from designing questions, it was important to take action to ensure the applicability of questions, types of questions used, logical sequences and wording of questions (Brancato et al 2004:30). The researcher minimised these errors by extracting variables from the literature, formulating questions based on the constructs of the theoretical models, and categorising the responses in well predetermined sequences.

The third step was pre-testing of the drafted tool. The pre-test was done to assess the respondent's feelings towards each question, the time it might take to complete, the ability

of the interviewers and the clarity of the questions. This was possible to pre-test on 10% of the participants outside the study setting. It was also helpful to know whether the data collectors understood the topic areas that the data collection tool intended to measure. Hence, the designed questionnaire was tested on 16 back patients at St. Paul Millennium Medical College, which have similar setting with the actual study settings. The researcher and data collectors discussed the feedback obtained from the participants specifically to determine if the data collection tool could capture the intended information. The outcomes of the pre-test were incorporated in the final tool.

The questionnaire was further validated by consulting experts from Neurology, Orthopaedics, Physiotherapy and Neurosurgery Department. The purpose of this review was to check the instrument for any potential pitfalls for the respondents and to get feedbacks from different experts. This was followed by the fourth step that focused on revising the questionnaire founded on the pre-test and incorporating opinions obtained from the experts. Based on the findings from the pre-test and the comments from experts, the tool was revised and refined as the final questionnaire.

The development of the questionnaire and pre-testing were done to test for validity and reliability. Validity and reliability of the revised tool will be presented in detail in the following section. However, the next two steps (data collection and data management) will be discussed below in section 4.4.8.3 and 4.4.8.4.

4.4.8.2 Validity and reliability

Validity and reliability are crucial measures used as the basis for determining how the data collection tool works (Golafshani 2003:598). The validity and reliability test requires that survey questions satisfy two conditions, that is (1) the participants must interpret the question in the same way; and (2) each participant must comprehend the questions the way the researcher intended to gather information (Mohajan 2017:15). The following sections explain the processes followed by the researcher in order to improve the validity and reliability of the questionnaire.

4.4.8.2.1 Validity

Validity refers to whether the data collection tool truly measures what it intends to measure or how truthful the research findings are (Golafshani 2003:598). There are three types of validity: construct, content, and face validity. Construct validity is whether the researcher can draw conclusions about test scores related to the concept being studied (Mohajan 2017:15). Unclear and ambiguous questions should be modified, and the non-functioning questions should be discarded by comments from the experts. In addition to this, construct validity was ensured by factor analysis (Rattray & Jones 2007:237). This technique was utilised to explore the relationship between variables.

Content validity is the extent to which the questions represent all possible questions that could be asked about the content (Mohajan 2017:15). Content validity of the data collection tool was insured by experts who were nominated on the basis of significant clinical experience on back pain. The researcher orally requested the involvement of experts in the validation process of the tool. The experts were requested to provide recommendations, comments, and options to modify the questions. The researcher allowed a one-week grace period to get responses to the request. At the end of validation, responses from the experts were considered and possible modifications of the questionnaire were made.

Face validity is the degree to which the data collection tool appears to measure what it intends to measure. It is usually used to describe the appearance of validity without empirical testing (Mohajan 2017:15). The researcher was aware that the data may not be valid because survey respondents may not understand the meaning of the questions to which they had responded, and they may face difficulty of remembering events that happened in the past. He improved the validity of the tool by observing adequate number of samples, controlling confounders by randomisation of participants and stratification.

There are two characteristics of validity. These are internal and external validity.

- *Internal validity*

Internal validity is the degree to which the findings are attributed to the independent variable and not some other rival explanation (Slack & Draugalis 2001:2174). Internal validity is concerned with the ability of developing an appropriate study design, establishing accurate

measurements of study variables and the uniform selection of samples. For this study, the researcher believed that the self-developed questionnaire and biased selection of subjects might be the potential threats of the study. Therefore, the researcher minimised these effects by following rigorous research methods through systematic random sampling, providing training for the data collectors and pre-testing of the tool.

- *External validity*

External validity refers to the extent to which the results of a study can be generalised outside the study settings (Slack & Draugalis 2001:2174). This usually depends on the degree to which the sample represents the population. Selecting of the samples by using a random selection process helps to improve representativeness of the sample. It is important to know that the findings from the study should be supported from other similar studies in a similar or/and different study population and settings. So, the researcher can make inferences, if his findings are similar with other studies.

In turn, low external validity in this study implied that the results can apply only to back patients visiting outpatient clinical services in Addis Ababa. Thus, external validity of this study may have been compromised by selecting a sample from hospital settings, of back patients who happened to visit outpatient clinical services during the data collection phase. There was no guarantee that the back patients who visited the hospitals had similar knowledge, attitudes and beliefs on LBP to those who did not visit the hospitals. Though, external validity was achieved by selecting participants randomly and reinforcing the finding with other similar or different studies from any parts of the world to check for its generalisability.

4.4.8.2.2 Reliability

Reliability refers to the extent to which findings are consistent over time and an accurate representation of the total population under study and the results of the study can be reproduced within similar settings (Golafshani 2003:598). Reliability is related to the data collection process and reveals the consistency of the data collectors and data gathering tool in measuring the intended variable to be measured (Denscombe 2010:144). It can be achieved by measuring Cronbach's alpha, which represents the uniformity of responses over items. It is calculated by splitting the sample of questionnaire items. It is realistic to calculate

for real-time responses, as it gives information on data instrument was consistently answered by individuals. For a self-developed questionnaire, the Cronbach's alpha should be more than 0.75 (Rattray & Jones 2007:237).

In addition to this, reliability was ensured via different methods. First, the questionnaire was designed carefully based on the constructs of bio-medical and health belief models. Second, the study tool was presented to field experts in order to obtain their comments and feedback. Third, the questionnaire was pre-tested on 10% of the total sample size. Fourth, the interview schedule was modified based on the results of the pre-test. Fifth, training for data collectors, legitimating the data, and lending credibility to the research report was conducted (Creswell 2009:149). Finally, Cronbach's alpha test was computed for both the pre-test and the post-test.

The data collection tool contains nine main sections: socio-demographic factors, general information about LBP, lifestyle factors, work-related factors, psychosocial factors, severity of LBP, impacts of LBP, and the HBM questionnaire. The first section (see Annexe G) of the questionnaire included the minimum variables extracted from back patients' medical records. The next nine sections of the survey questionnaire (see Annexe H) were developed based on the constructs of the bio-medical and health belief models. The final section from this tool, HBM questionnaire, was presented in a Likert format within the six constructs of the health belief model. The Likert scale was used to offer the answer choices for the participants in order to reduce the time they spent to write. The questionnaire was prepared in English and then translated into local language, Amharic (see Annexe J), which was the first language of most respondents. Reliability is determined using statistical analysis of the questionnaire. The procedure of the reliability test is presented below:

- Determining reliability of the questionnaire

The most widely used indicator to know the internal consistency of the questionnaire is Cronbach's alpha test (Peterson & Kim 2013:194). It gives reliability estimates from the consistency of item responses from a pre-test or a post-test assessment. Only questions that scored Cronbach's α of 0.75 and above were included in the final version of the survey questionnaire (see Annexe I).

In order to know reliability of the pre-test questionnaire, a total of 107 question items were measured. Fifteen (15) question items that scored less than 0.75 were excluded for the post-test. These excluded items were number of pregnancies, home-made activities, number of episodes of LBP, recovery from the previous episode, previous diagnostics, previous treatment, romantic relationship, advice from healthcare providers, and seven (7) items from the HBM questionnaire.

Similarly, the alpha test was computed for the post-test and variables which scored ≥ 0.75 were included in the final analysis. In general, the Cronbach alpha value of the questionnaire used for this survey was 0.895 (after five questions were removed). The Cronbach alpha coefficient for this study exceeded 0.75, thus the questionnaire used by the researcher was fulfils the internal consistency requirements. Hence, income, height, weight, smoking status, and alcohol consumption were not included in the final analysis. But these variables were explored in the qualitative phase of the study in order to widen the scope of the findings. The data collection process is presented as follows.

4.4.8.3 The data collection process

In the study, the survey was the first point for the process of data collection. The survey was a foundation for the second phase of the study. The researcher deployed qualified diploma nurses as interviewers to collect the quantitative data. There were three diploma nurse data collectors - one data collector in each public hospital, who participated in the data collection. The data collectors were recruited from the departments of selected public hospitals. This enabled the data collectors to easily locate back patients during their working hours. After this, they arranged suitable data collection rooms and times for the interview. After obtaining consent from the participants, they extracted variables from the medical records of the patients and conducted the interviews via one-to-one conversations. The researcher and data collectors administered the questionnaire at three public hospitals.

Different activities occurred during the actual data collection processes. The data collection process was started by obtaining ethical consent from the hospital's administrative bodies and departments. Then the head or coordinator of each department were communicated and asked about the weekly schedule for Neurology, Neurosurgery, Physiotherapy and orthopaedics clinics. They informed us that the patients were scheduled to came to the clinics

before 1 am and patient assistants were thought to bring the patient medical records before 1:30 am. Based on the schematic schedule of each departments, the researcher and the data collectors were available before specialists started their routine activities. This enabled the researcher and the data collectors to easily access the study sites and participants.

The data collectors arranged free rooms for the interview and the researcher selected the respondents from the scheduled lists of back patients. Then, identified patients were called to the room and the aim of the study was explained for them. After this, they were asked for their continued consent to participate in the study. Consent was taken from the interested participants and the interviews were conducted. Those individuals who were not interested to participate in the study were acknowledged by the researcher and sent back to their waiting area. The schedule for the interviewing was modified based on convenient times for the back patients and availability of the room. This measure was taken to avoid any negative impacts posed by the survey on the services provided by the clinics.

After finalising the interview with each back patient, secondary data was collected from their medical records. All medical records of the back patients were accessed at the outpatient clinics. The data was extracted by utilising the data extraction sheet prepared by the researcher. The collected data from patients and medical charts were checked for any missing data.

Regarding the distribution of the questionnaire to the selected hospitals, eighty-four (84) questionnaires were disseminated at Zewditu Memorial Hospital, which was followed by sixty-seven (67) at Tikur Anbessa Hospital and twenty-eight (28) at ALERT Hospital. A total of one-hundred and seventy-nine (179) back patients were interviewed to complete the questionnaire. However, nine (9) questionnaires were incomplete and discarded from the data entry template. The actual respondents were one-hundred and seventy (170) compared to the initial weighted sample size (n=159) in section 4.4.5. There was a high (78.3%) response rate of the respondents (Bernard 2011:196). The data quality management process is detailed below.

4.4.8.4 Data quality management

The researcher used a self-developed data collection instrument, which had been pre-tested in a real-life situation and verified by experts that used to improve data quality. This further

amended by utilising experienced data collectors, providing training for data collectors, and closely supervising them. A good data management also includes effective process of designing, collecting, recording, storing, cleaning, transferring, presenting and retrieving data (Figure 4.5 above) (Peersman 2014:6). The researcher tried to look on what happened during the time of data collection. This was important to have the collected data in an accepted quality level. This was achieved by a timely data management system.

The researcher strictly supervised the data collectors during the data collection period. Filled questionnaires were checked before the data collectors left from the respondents. After collecting the data, the researcher and data collectors checked for any missing or inaccurate data. When a missed or inaccurate data were found, an appropriate measure was taken by the researcher and the data collectors. On daily bases, all completed questionnaires were checked by the data collectors for completeness and quality of the data. Once more, filled questionnaires were checked by the researcher once in a weekly basis. The researcher also made unplanned supportive supervision site visits to randomly check the quality of completed questionnaires. Smooth communication was maintained throughout the process with the data collectors and the researcher to detect and manage any difficulties as early as possible.

The collected data was sent to the researcher and recorded onto a template prepared on Epi Info version 3.5.4. After finishing the data entry process, the data was exported to Statistical Package for Social Scientists (SPSS version 24) for cleaning and verification. During data cleaning and the verification process, there was (4%) of missing data from different items of the questionnaires. Even if there is no consensus between literary sources about how to deal with missing data, Parent (2012:25) recommended the use of missing data analysis to fill the missing data. For this study, missing data analysis with expectation maximisation was implemented to fill the missed data.

During the data cleaning stages, the researcher found no errors during writing, reading, storage, and processing of stored data. The data was stored in a designated locker in order to maintain the privacy and safety of the data. Further, the quality of data was maintained by an appropriate data analysis and presentation of the finding in a good and clear format. Finally, the data is secured and available so that anyone can verify and used for any other purposes. The data analysis process is explained in detail below.

4.4.9 Data analysis

Data analysis is the process of converting questions into meaningful and statistical reports (Bhattacherjee 2012:119). Analysis of the data was performed based on the categories of the questionnaire: demographic variables, general information about LBP, lifestyle factors, work-related factors, psychosocial factors, severity of LBP, impacts of LBP and the constructs of HBM. The statistical presentation of data was used to convert and condense the collected data into an organised visual presentation (Cornwell 2009:218). The first phase of the study used quantitative data analysis to gather outliers, which was further explored by in-depth interviews and key informant interviews.

The collected data was coded and entered into Epi Info version 3.5.4 software. After completion of the data entry process, the data was exported to SPSS version 24 for data cleaning and analysis. The analysis was performed by conducting Cross tabulation to determine the relationships between the risk factors to the demographic profiles of back patients as age, gender, educational level, marital status and type of house used to live. The descriptive statistics simplified the process of writing the results of the analysed data. In order to report the findings; percentages, mean and standard deviations were computed. The Chi-square test was computed to test the association between demographic variables with the risk factors of LBP. However, the association between continuos variables were computed by Pearson correlation coefficient (r). The results of the study were presented in diagrammatic presentations using figures and tables. A probability level of 0.05 or less was used for all statistical tests ($P \leq 0.05$). Finally, the pertinent findings of the study were validated for internal consistency and generalisability by using external benchmarks. Ethical considerations for the first phase of the study is described in the following subsection.

4.4.10 Ethical considerations

Ethics is the moral obligation that the researcher followed throughout the research process (Ulin, Robinson & Tolley 2005**:**58). The researcher must protect and respect the dignity and autonomy of participants during his enquiry. In addition to this, he must respect the ethics of research process and public hospitals, where the participants were found. So ethical issues are vital to safeguard both the participants and the researcher to support mutual understanding and communication. The following ethical principles were considered to

protect them from any adverse effects from the study.

4.4.10.1 Permission to conduct the study

A letter of permission was obtained from the Ethics and Higher Degrees Research committee of the University of South Africa (UNISA), Department of Health Studies. A second written permission letter was obtained from the Federal Ministry of Health of Ethiopia, Addis Ababa Regional Health Bureau and Addis Ababa University. A written permission letter was also granted from Zewditu Memorial Hospital, Tikur Anbessa Hospital and ALERT. Then, Neurology, Orthopaedics, Neurosurgery and Physiotherapy Departments were informed about the research project. (Please see appendices for copies of each of these letters).

4.4.10.2 Principle of informed consent

According to Radia's (2014:2) definition, informed consent "is the process of enabling patients to make decisions by themselves by understanding the facts, implications and future consequences of the research". It is the principle that participants should not be forced, influenced, or encouraged into the research against their interests, but that their participation should be based on voluntarism, and on a full understanding of the implications of participation. In order to say that an informed consent is valid, it must fulfil the following four criteria (Radia 2014:2-3).

1. 'Informed' refers to ensuring that all information wanted by the researcher is accurately disclosed to the participants and they should able to offer consent to gather the information.
2. 'Consent' refers to ensuring that participants are capable of making a rational decision to participate, and their agreement should be voluntary rather than the result of pressure or unnecessary influence.
3. 'Voluntary' means the decision to consent and not consent must be given by the participants without any influence from the researcher. The information sheet should state clearly that participation in the study is completely voluntary.
4. 'Competence' means the participants must be mentally capable of giving consent, which means they should understand the information given to them by the researcher and they should be able to use it to make an informed decision.

Regardless of the mechanism for obtaining consent, the study design should include a description of possible risks that could result from participation in the study, as well as the statement of informed consent exactly as it will be presented to the participant (Priscilla et al 2005**:**58). After obtained permission to conduct the study (See Annexe C), the researcher provided information to the participants about the aim of the study (See Annexe E). The possible risks and benefits, the purpose of the research, how participants were chosen to participate, data collection procedures, and whom to contact with questions and concerns, were thoroughly explained to the participants. In addition to this, they were assured that their rights to participate voluntarily and that their anonymity and privacy was protected. This explanation helped in the process of developing trust and confidence between the researcher and the participants. It also fostered transparency regarding the actual objectives of the study. Finally, the participants were asked to participate in the study voluntarily and consent was signed in he/she decided to participate.

4.4.10.3 Principles of confidentiality and privacy

Confidentiality refers to the collected data from the study participants will not be disclosed to a third party without permission (Talerico 2012). The common practice of coding participants to protect personal identity can be explained as further assurance of privacy. The participants statement should be held confidentially and saved in a secured place. At the beginning of the data collection, it was vital to discuss the confidentiality provisions in order to get informed consent and to build trust with the study participants. Information about patients is confidential and never be discussed in public places (Priscilla et al. 2005**:**58).

For this study, confidentiality and privacy was ensured by different mechanisms. First, the participants were assured that personal information would not be disclosed to a third party. Second, the questionnaires did not include personally identifying questions like name and address. Third, the questionnaire used a code system to protect the identity of the participants and at the same time to identify the questionnaires. Fourth, the collected data from them were not discussed and presented in ways that ensure participants could be identified. Fifth, the questionnaires were locked in a locker to prevent access from unauthorised person. Sixth, at a time of data cleaning phase, the researcher removed all possible participant identifiers. Seventh, the electronic data will be stored in a secured cloud

storage. Finally, the stored data did not be disclosed to any person and transfer between the researcher and institutions and electronic devices was always conducted securely.

Medical records of back patients were accessed for extracting important variables. Since these documents are anonymously registered, getting consent from the public hospitals was enough to access them (Hesse-Biber 2010:56). In the course of conducting the study, efforts were made not to compromise the services provided by the public hospitals to the patients. The researcher and data collectors respected the rules and regulations of each public hospital.

4.4.10.4 Principle of beneficence

Beneficence refers to benefits or an action that contributed to the participants. The principle of beneficence includes the responsibility of the researcher to do effective and significant research that can promote the wellbeing of the population (Fouka & Mantzorou 2011:5). The study benefited the participants by enabling them to reflect back on their experiences with their LBP. Back patients also had an opportunity to tell the truth behind the sine of LBP. The study findings and recommendations provided by the researcher may in the future benefit the back patients, health facilities and other respected interested researcher to address the risk factors of LBP and promote the model.

4.4.10.5 Principle of non-maleficence

Non-maleficence refers to a responsibility not to impose harm or risk deliberately to the participants. As in any other type of scientific research conducted on people and health, the researcher has to guarantee to protect the safety of the participants. This means ensuring that participation in th survey does not bring any harm to any of the participants or to the researcher (Priscilla et al 2005**:**58). It is important to remember that potential harm to them is not just physical but can be psychological, social, economic, or professional. In fact, physical wounds may heal more quickly than psychological or social wounds. The researcher should protect them from these harms. Great care must be taken to minimise such types of potential harms from the intense emotional responses occurred during the data collection period (Peter 2015:2626). The researcher must anticipate that simply talking with the participants may frustrate the safety of the participants.

In order to protect them from any harm or risk, healthcare providers were recruited as data collectors. The researcher minimised these side effects by recruiting health professionals as data collectors and each was requested to ensure that they kept their professional codes of conduct. In addition to this, they were given training on the research process, data collection mechanisms, and in developing trust with participants to minimis any of the expected harm or risk factors (Denscombe 2010:64). The participants had full right to refuse to respond to any question and if they did not want to participate, they had the proviso to not respond to any aspect of the questionnaire. For those who were in need of further management, they tried to link them to the specialist to have better treatment options.

4.4.10.6 Principle of justice and fairness

Justice refers to treating participants equitably or distributing benefits and/or burdens fairly (Priscilla et al 2005**:**58). It is related to the researcher's selection of the research participants. The study used the systematic random sampling technique to select back patients thus all the back patients had equal chances of taking part in the study. The research participant's selection criteria were founded on the research process and not on the current situation of back individuals. Complete justice could not be achieved with regard to back patients as only those already attending outpatient clinical services were included but these are the patients suffering from LBP who represent all back patients who are found in Addis Ababa.

4.4.10.7 Principle of self determination

The rights of the participants were respected because they decided independently without any influence to participate in the study. They had rights not to give answers to any or part of questions that caused discomfort and uncertainty. The right to full participation was respected because the researcher stated the process of the research as well as the rights of the participants to participate or to refuse to take part in the study. The researcher followed the same ethical principles and procedures for both the first quantitative and second qualitative phases of the study. For the details, please see the qualitative phase section 4.5 below.

4.5 PHASE II: THE QUALITATIVE PHASE OF THE STUDY

4.5.1 Introduction

Qualitative researchers believe that there is no objective social reality. All knowledge is constructed by the researcher who is the product of beliefs, traditions and the social and political environments within which he operates. This phase of the study enabled the researcher to have a deeper explorative understanding of development of LBP. In addition to this, the qualitative phase of the study was used to broaden the quantitative findings that used to explore the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours in the development of LBP, and to explore in-detail the key bio-medical and culture based modifiable risk factors of LBP that support the development of a culturally sensitive preventative model for the prevention of LBP.

In this second phase, a phenomenological qualitative methodology was utilised to explore the influence of cultural beliefs on the development of LBP. This phenomenological qualitative research followed the constructs of the bio-medical and health belief models. A theory guided inquiry was utilised to assist the researcher to explore the modifiable risk factors of LBP. This was done by exploring experiences, attitudes, perceptions, motivations and beliefs of back patients towards back pain. In addition to this, the experiences and knowledge of healthcare providers on LBP was explored. Finally, the identified modifiable factors from both the quantitative and qualitative phases were used to develop the preventative model for the prevention of LBP.

In order to collect trustworthy data from the participants, the researcher selected back patients and healthcare providers from the waiting area and departments of the study sites, respectively. The following sections presents general highlights about the sampling method that followed in the second phase of the study.

4.5.2 Sampling techniques

A high quality of research findings can be achieved through selecting participants from the waiting area of the outpatient clinics. This technique assisted the researcher to reduce the selection bias that might occur during selecting the participants. When the researcher employed this technique, he could easily infer the findings from the sample to the study

population. However, in some situations, the researcher may not have full access to contact all participants. For such difficulties, it is recommended to use non-random sampling procedures to select participants considered as influential and knowledgeable with regard to back pain (Panacek & Thompson 2007:75). Therefore, the researcher utilised the purposive sampling technique in order to select participants for the second phase of the study.

Purposive sampling procedure refers to the researcher purposefully selecting a limited number of *participants* to take part in a specific topic. This is applicable when there is a small number of samples and the researcher believed that they had the necessary detailed knowledge on LBP. In such cases, the researcher may ask participants who they will volunteer and follow through with the study protocols. In order to have trustworthy data, this technique is preferred in the qualitative research. This approach sometimes leads to a serious researcher bias in the selection of participants that could invalidate the final results (Panacek & Thompson 2007:75). The researcher minimised this effect using a range of methods.

The researcher used purposive sampling to select the participants based on their prior experiences of LBP. This is a deliberate selection of specific participants because the researcher believed that they could provide important information regarding their experiences and feelings on back pain. The researcher used this technique for three reasons. These are:

- Participants who had experienced first-hand LBP,
- Participants who had believed to respond differently to the research questions, and
- Participants who had particular knowledge or expertise on LBP.

The next section elaborated further on the criteria used to select the study population.

4.5.3 Study population

The study population for the second phase of the study were back patients that were attending clinical follow-up at the selected public hospitals. In addition to this, healthcare providers who satisfied the inclusion and exclusion criteria were participated to share their knowledge on back pain. The healthcare professionals were physiotherapists, Neurologist, Neurosurgeon, and Orthopaedist. The inclusion of patients and healthcare professionals

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allowed the researcher to elicit various insights and opinions about LBP based on their lived-experiences and extensive knowledge. Here below are the operational definitions of these two categories of the participants:

- Back patients were those individuals who were diagnosed with LBP by any medical personnel and attended outpatient clinical services in the study area and received services repeatedly by the service providers.
- Healthcare providers were those health professionals of any category who has been working for at least six months in each selected outpatient departments during the study period. They were expected to provide clinical services for back patients.

The back patients were selected purposively from the waiting area of each department. This was done by taking their names and address from the outpatient abstract registry form. The researcher contacted them and asked their interest to participate for the study. If they are interested to participate in the study, the researcher purposefully nominated as the study participants. Whereas, the healthcare providers were selected purposively from the selected departments based on their experiences on back pain management. The inclusion and exclusion criteria is mentioned in the following subsection.

4.5.4 Inclusion and exclusion criteria

The inclusion and exclusion criteria for back patients were presented in section 4.4.6 above. The inclusion criteria for the healthcare providers were mainly focused on including participants with extensive knowledge about LBP in order to get widespread views and rich information. Therefore, the inclusion criteria for the healthcare providers included those healthcare professionals who were working for at least six months at the selected public hospitals and offered clinical services for the back patients more than once prior to the study period were included as participants for the study.

The exclusion criteria for the healthcare providers were those individuals who have worked in the public hospitals for less than six months and those professionals who were not available at their workstation due to annual leave or any other reason were excluded from the study. The issues regarding the determination of sample size are presented in detail below.

4.5.5 Sample size

The sample size for the second phase was determined by the data saturation, which was confirmed by the researcher during the data collection period. Data saturation is a point at which the researcher identifies that no new information is emerging during interviews with prospective informants (Denscombe 2010:96 & Ellis 2010:36). In this research, the researcher collected textual data via 18 in-depth interviews with nine IDIs with male back patients and nine IDIs with female back patients. Additionally, eight key informant interviews were conducted with healthcare providers that included an Orthopaedist, Neurosurgeon, Physiotherapists, and Neurologist. The diagrammatic presentation of the sample size for the qualitative phase of the study is presented below.
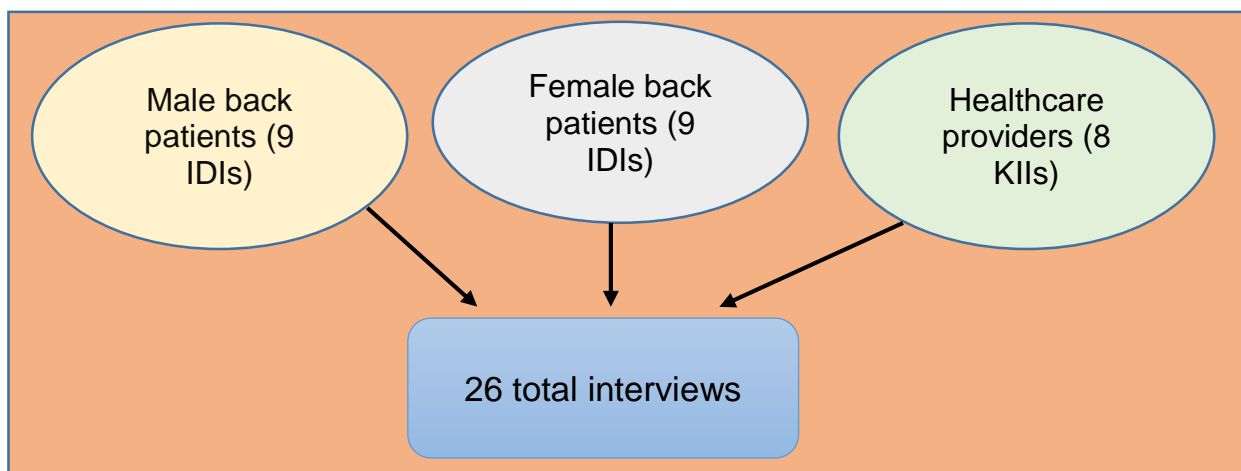
Figure 4.6 The total number of interviews performed in Addis Ababa

4.5.6 Qualitative data collection methods

The data collection methods in qualitative research were determined by the research objectives and also, the study design guided the process. The researcher can choose any method in order to collect textual data from the participants. Qualitative researchers usually use in-depth interviews, focus group discussions, participant observations and abstraction of documents as data collection instruments. For this study, the researcher used in-depth interviews and key informant interviews as a data collection tool because the researcher found this technique to be a suitable method to use with the study participants.

The data collection was conducted over a 3-month period in Addis Ababa public hospitals. Data was collected in the natural environment with the interaction of the researcher and the

participants. Data collection was guided by open-ended, semi-structured interviews that were used to validate the findings from the first phase of the study, where the participants could not provide deeper understanding of the risk factors of LBP. The findings from the quantitative phase of the study were used to guide the interviews conducted with back patients and healthcare providers. Here, individual interviews were used to explore the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours in the development of LBP and to explore the key cultural and bio-medical modifiable factors that support the development of a model for the prevention of LBP.

The interviews were held in the public hospitals and outpatient clinics at a time when least disturbance was possible. Audio cassette tape recorders were used to capture the whole conversations. Field notes were also taken to document the dynamic created by the researcher, the respondents, and the research settings. To enrich the primary source of data, the researcher included back patients and healthcare providers as a primary source of data. In-depth interview and key informant interview are almost similar in the context and rationale used by the researcher. So, he presented them together as interviews in order to minimised overlapping of ideas and concepts. The following section elaborated the interviews used as a data collection tool.

4.5.7 Interviews

The interview is a one-to-one conversation between the researcher and the respondents to elicit the interview's knowledge on a topic. It is important to explore individual's values, beliefs, understandings, experiences, perspectives, and feelings of an issue (Boyce & Neale 2006:3 & Allmark, Boote, Chambers, Clarke, Mcdonnell, Thompson & Tod 2009:49). Interviews allowed the researcher to ask questions on complex concepts on LBP and learning more about the risk factors that have significant contributions on its development. In order to conduct the interviews, the researcher applied the following four general features of an interview (Brancato et al 2004:20). These were:

1. The researcher develops themes to reflexively explore the quantitative findings.
2. The researcher prepares grand tour questions to encourage the open dialogue with interviewees in response to given research questions.
3. When the interview proceeds, probes were applied to get detail to give insights on

concepts of interest.

4. Finally, the researcher anticipated to elicit data in support of the development of a new relevant prevention model by exploring the influence of culture on the health promoting and health jeopardising behaviours.

4.5.7.1 The rationale of using interview

The rationale for conducting interviews were:

1) to assess the researcher's philosophical stances and assumptions,
2) to strengthen the interpretations of previously found quantitative results,
3) to collect opinions, beliefs, and attitudes of back patient and healthcare providers towards LBP,
4) to encourage thoughts and stimulate emerging new concepts about the influence of cultural beliefs on the development of LBP, and
5) to provide opportunities for the researcher and participants to explore the key bio-medical and culture based modifiable factors that support the prevention of LBP.

4.5.7.2 The processes of interviews

The processes involved developing the grand tour questions, identifying the back patients and healthcare providers, selecting a research assistant for the researcher, giving orientation about the study to the assistant and pre-testing the grand tour questions, choosing an appropriate interview place and conducting the interviews, and transcribing, analysing and interpreting the interview. The process of conducting the in-depth interviews and key informant interviews is presented diagrammatically in the following diagram.
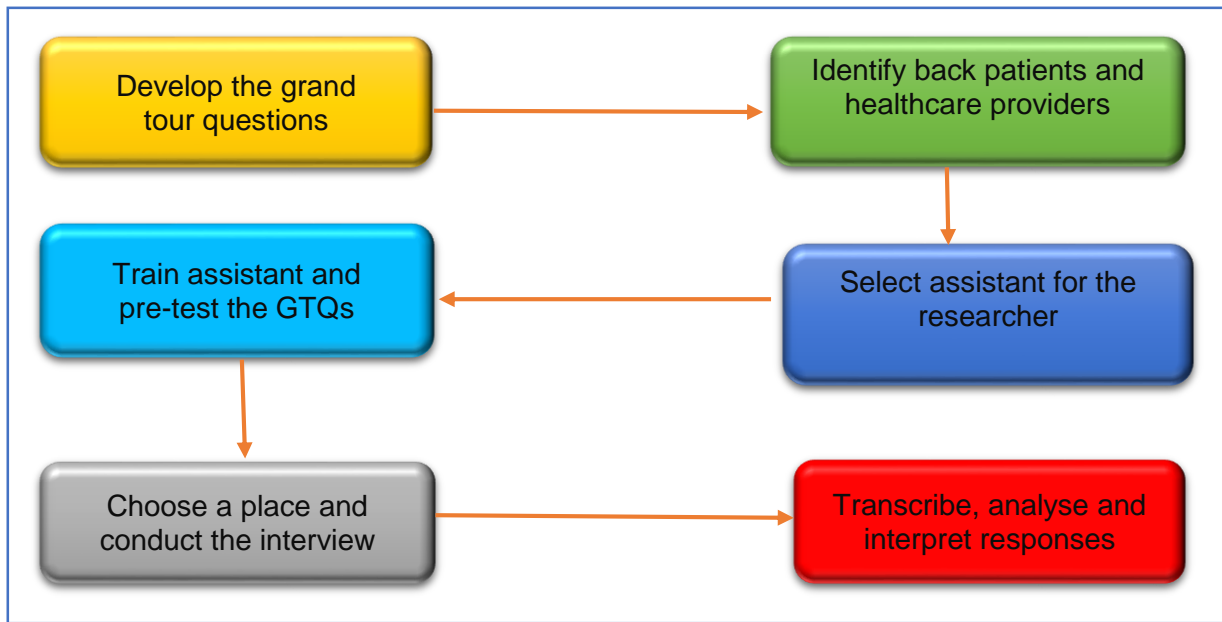
Figure 4.7 The processes used to conduct interviews with back patients and providers

The steps used to conduct the interviews are:

Step 1: The themes of the GTQs were developed based on the findings of the 1st phase of the study, where the researcher required further exploration of the results. It incorporated the sections of the survey questionnaire. The GTQs were open-ended and targeted to move from a general to specific topic. The questions for back patients and healthcare providers are presented in section 4.5.7.3 below.

Step 2: The process of identifying back patients was based on their prior experiences of LBP. Whereas, the healthcare providers were selected based on their extensive knowledge and expertise on LBP care. Back patients were identified in the waiting area of each outpatient departments. The healthcare providers were contacted through their respective departments. These procedures were carried out to easily trace the back patients and healthcare providers.

Step 3: The assistant for the researcher was selected based on his good communication skills in hospital settings and experiences in a qualitative research. He has been nominated

outside the study population. He was a bachelor's degree holder in physiotherapy and working in a hospital setting for more than five years.

Step 4: The assistant for the researcher was offered training with regard to the aim of the study, the purpose of the questions and the interview sessions, and how to conduct the pre-test. He was also trained on how to facilitate the specific sessions during the data collection period and how to co-facilitate the interviews in order to increase the trustworthiness of the collected data. The pre-test of GTQs was conducted based on the points stated in section 4.5.7.3 below.

Step 5: The places for conducting the interviews were selected based on the suitability to the interviewees, research assistant and interviewer and also on the basis that they enabled private and comfortable engagement.

Notepads, pens, tape recorders, refreshments, watch, and chairs were prepared in order to conduct the interviews. Pens and notepads were used to take notes during the interviews. The tape recorder was used to record the interview sessions. In order to stimulate the interviews, the researcher presented refreshments for the participants. The interviews were conducted at different times of the day depending on the convenience to the respondents and the institutional regulations. The duration of the interviews was between 45 and 60 minutes depending on the active participation of the respondents. All interviewees were conducted in Amharic, which is the local language of the respondents.

The researcher first asked the respondents to sign the consent after having explained their rights and autonomy (see Annexe K). In addition to this, the researcher informed the respondents about how the collected data will be used after the session. The researcher led and initiated the interviews with a five-minute presentation of the research topic, pertinent findings from the 1st phase of the study and the aim of the interview session. After finishing the presentation, the researcher mentioned the ground rules that the respondents should follow during the interview period. This was helpful in order to maintain the interview smooth, promote active participation, and making the interview focused to the results from the survey. The researcher also told to the respondents that he would record the interview and take note during the interview.

Back patients were asked to share their lived experiences on back pain and the healthcare providers shared their general knowledge and thoughts on LBP. The healthcare providers were also allowed to mention the modifiable and non-modifiable risk factors of LBP on the leaflet they were provided after the interview. Furthermore, the researcher used different methods to get deeper insights by utilising probe by rephrasing to clarify what they said, reflecting feelings they expressed, and summarising the main points, feelings, and thoughts they talked. Finally, the researcher closed the interview after thanking the respondent, giving them an opportunity for further ideas and explaining the interview was finished.

Step 6: The process of transcribing, presenting, analysing, interpreting results, and writing the report of the interviews was outlined below in the data analysis section (see section 4.5.8).

In addition to the above stated points, the researcher was interested to explore new, complex issues about the development of back pain using interviews with the respondents. For this reason, he used probing questions in order to explore the influence of cultural beliefs on the development of LBP and deepen the scope of the study. This process needs a flexible, experienced, and professional researcher with a broader knowledge on LBP. The researcher has extensive experience on different types of qualitative interviews and has over ten years of professional experience in managing LBP. Furthermore, the researcher recorded the interviews using a tape-recorder in order to retain all responses from the respondents. Information saturation was reached after conducting 18 in-depth interviews with back patients and 8 key informant interviews with healthcare providers. Saturation means reaching a point where further interviews no longer offer new information about the influence of cultural beliefs on the development of LBP. It is a clear signal that the researcher used as a basis for ceasing the collection of data (Allmark et al 2009:49).

4.5.7.3 The grand tour questions

A grand tour question was used to conduct the interview with back patients (see Annexe M) and healthcare providers (see Annexe Q). In order to verify the grand tour questions, the researcher conducted pre-testing with two back patients (one male and one female) and one healthcare provider. The findings of the pre-test were included in the final analysis because the pre-test showed the instrument and questions to be appropriate in their original format.

The interviewees had guaranteed them the information being gathered was confidential and only focused on what they know about LBP. The data analysis process for this phase of study is presented as follows.

4.5.8 Data analysis

Qualitative data analysis is the process of presenting textual data in a logical manner. It is a process where the researcher takes textual information and offer an explanation or interpretation. It is a process that is used to reduce and make sense of large amounts of information from back patients and healthcare providers. The participants can also take an active role in identifying key themes emerging from the qualitative data. Because qualitative analysis depends on the researcher's impressions, it is important that the researcher reports his impressions in a structured and transparent method. This ought to pay attention to the spoken word, context, consistency and contradictions of views, emerging themes and trends.

The main aim of analysing data is to condense all the collected data to key themes that can used to answer the research questions. The recorded data were collected and labelled according to the date and time it was collected. Then it was uploaded onto the computer for editing, storage and retrieval. The audios were manually transcribed by the researcher. The transcripts were translated from Amharic into English and typed onto the computer. The collected qualitative textual data were a set of interview transcripts that transcribed and saved in a Microsoft Word (.doc) files.

The ATLAS-ti software package was used to export all word files and enabled the researcher to save a whole project consisting of the raw data, coding tree, coded data, and associated memos and notes. The coding process was subjective and guided by the theoretical framework. A code is a word or a short phrase that descriptively captures that essence of elements of the quotation and is the first step to reduce and interpret data. In order to speed up the coding process, the researcher read all of the data, developed a coding framework, which consisted of a list of codes that the researcher anticipated to divide the data into. The researcher familiarised himself with the collected qualitative data through reading and re-reading of data.

The researcher followed a thematic approach by continuously developing the coding framework based on the quantitative findings. As he progressed on the analysis, he merged,

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divided and renamed codes. There were no fixed rules he followed to restrict the number of codes, but there were not more than 100 codes. Codes relevant to the research questions and the most vital codes for the basic themes were included. Once the data was coded, he started developing themes from the codes. After developing a basic theme, he examined the theme and organised themes into higher order and more interpretative themes. The interpretation of findings was presented using a quotation scheme. After finalising the writing up phase, the findings were validated by triangulating the findings with the quantitative findings.

4.5.9 Trustworthiness of the qualitative data

The methodology for the study was grounded on the epistemological, ontological, and methodological assumptions. The researcher believed that there is no single universal truth in qualitative research. It is influenced by a multi-faceted social reality created by the interaction of human beings. Qualitative research is focused on describing, interpreting and understanding the meanings given by individuals' traits and relational existence and to their world. The findings from the qualitative study must be judged by criteria that can fit with the research paradigm followed by the researcher. Both the quantitative and qualitative phase of the study was used to generate trustworthy information about prevention of LBP. The quantitative part of the study was judged by the validity and reliability of the collected and analysed data. But the criteria used for the first phase of the study was not used to evaluate the quality and scientific rigor of the second phase. It is crucial to evaluate the trustworthiness of the qualitative phase of the study through the constructs of credibility, transferability, dependability and confirmability. These concepts replaced validity and reliability that was used in the first phase of the study. Table 4.2 below presents the criteria utilised to assess the trustworthiness of the qualitative phase:

Table 4.2 The criteria used to assess trustworthiness of the qualitative research

Questions asked	Issue	Qualitative criteria
How the researcher measured what he set out to measure?	*Truth value*	Credibility
How applicable are the results to other similar and/or different participants and settings?	Applicability	Transferability
Would the findings be repeated if his research is replicated in the same context & participants?	Consistency	Dependability
To what extent are his findings affected by personal interests and biases?	Neutrality	Confirmability

Source: Researcher compilation

- Credibility is the magnitude to which the collected and analysed qualitative data are believable within the constructed social phenomena by reflecting opinion and feeling exactly. It places emphasis on creating a link between the constructed truths of participants and those truths stated by the researcher (Ranjit 2011:172). For this study, credibility was secured by recording audios, spending longer periods in the field, checking the interpretation of the results with colleagues, submitting transcripts to the participants, and using logical frameworks. Furthermore, the researcher visited the hospitals at peak and off peak hours of the working day in order to sample all possible work conditions.

- Transferability is the degree to which the results of qualitative findings can be generalised to other similar and/or different contexts or settings (Ranjit 2011:172). Transferability of the research findings was maintained by extensively describing the research processes that can be followed and replicated by others, using representative samples, including different disciplines of healthcare providers, document review, and tick description.

- Dependability is the extent in which a research finding is replicated within similar circumstances. A qualitative research must advocate flexibility and freedom (Ranjit 2011:172). Dependability was ensured by setting a clear research questions, in-depth explanation of the study methodology, and keeping an audit trail; field notes and audio tapes.

- Confirmability is the degree in which the final result of the finding can be repeatedly confirmed by other researchers (Ranjit 2011:172). In this study, the researcher ensured confirmability of the findings of the study by precisely reflecting the participants' viewpoints and using reflexivity. Reflexivity as the process of exploring the dynamics of researcher and participant relationship and how the research is formulated (Holloway & Todres 2005:279).

The researcher was aware that distancing himself from his assumptions, biases and values was important to minimise their effects on the research processes. The researcher tried to minimise the biases that he introduced in the inquiry by reflecting all of his assumptions, beliefs and professional exposure consciously as much as possible till he finished his study. Ethical considerations that were made in advance of the study are presented.

4.5.10 Ethical considerations

The researcher followed the same ethical principles throughout the 1st and the 2nd phases of the study. The basic principles that are relevant to the ethics of the research involving the human subjects are respect to person, beneficence and justice. Respect for person addresses respect for autonomy and protections of individuals with impaired autonomy. An autonomous person is one who is mentally capable of giving consent for the researcher. The respondents must be treated in an ethical manner not only by respecting their decisions, but also protecting them from harm and risk. The researcher maximised their benefits and minimised the possible physical and psychological harms. After addressing all these ethical issues, they were treated in accordance with morally right and proper ways. The researcher also ensured that these values were retained throughout the research.

In the next sections, additional important ethical issues are discussed in-detail.

4.5.10.1 Getting valid informed consent

Informed consent is an initial priority of health research ethics. The information sheet developed by the researcher stated all necessary information about the nature of the study, the purpose of the study, potential risks and benefits of participation, the procedures taken to insure confidentiality and privacy, and voluntary participation. In order to obtain informed consent, the researcher followed the following steps.

- First, an ethical clearance certificate was obtained from the University of South Africa (UNISA), Department of Health Studies (see Annexe B).

- A copy of this ethical clearance certificate, a copy of support letter from regional learning centre, and the researcher's application letter to get permission to start the study was submitted to Addis Ababa Health Bureau and Addis Ababa University (see Annexe C and Annexe D).

- Then a permission letter was written by the above stated authority bodies to the selected public hospitals in order to conduct the study (see Annexe D).

- Finally, Neurology, Orthopaedics. Neurosurgery and Physiotherapy Departments were received the permission letter and inform all the head of departments and respected coordinators about the study to simplify the data collection.

The interviews were conducted after obtaining informed consent from the back patients and healthcare providers.

4.5.10.2 Justice

In this research, the researcher presented an information sheet and consent form (see Annexe E and Annexe F) and worked hard to insure privacy and confidentiality. The researcher discussed the issues of abovementioned principles with back patients and healthcare providers to get permission to undertake the interviews. He tried to discuss other matters based on expressed participant concerns before starting the interviewees. They were selected purposively based on their experiences and expert knowledge of LBP. The researcher followed a strict and scientific process to maintain professional and moral integrity. Any information gathered from the respondents was kept confidential and locked in a safe place.

4.5.10.3 Maintaining confidentiality and privacy

Confidentiality refers to not disclosing any information gained from an interview accidentally or deliberately, in ways that might identify back patients and healthcare providers (Talerico 2012). The back patients were approached during their follow-up sessions and healthcare providers were approached during their working hours at the selected public hospitals. Back patients were interviewed in a convenient room. However, healthcare workers were allowed to choose the venue where they wish to be interviewed. The researcher also checked and

assured the safety of the selected area for interview to ensure physical and sound privacy (Priscilla et al 2005**:**58). Textual data gathered from them was used only for research purposes and handled in a way that ensured confidentiality. The records were password protected to prevent unauthorised access. Collected data will be saved for two years after completion of the data collection.

4.5.10.4 Minimising harm and risk

The researcher used interviews to explore the influence of cultural beliefs on the development of LBP. This exploration was very detailed and involved a deep probing into the personal experiences of the respondents about pain. The discussions had minimal potential for causing some psychological distress as individuals may have re-experienced painful events or disclosed highly painful information. To protect them from any harm or injury that could happen in the study, the researcher did not elicit secret experiences, wishes, fears and confessions from the respondents. He avoided deception and asked permission to record responses.

4.6 PHASE III: MIXED METHODS RESEARCH

The integration of the two phases of the study findings could give the researcher a broader understanding of the research topic. The quantitative section described the demographic profile of individuals affected by LBP, the prevalence and severity of LBP, impacts of LBP and the associated risk factors of LBP. Whereas, the qualitative phase of the study offered deeper understanding of the influence of cultural beliefs on the vulnerability to LBP and the bio-medical and culture based modifiable risk factors. Mixed methods allow the researcher to triangulate findings, which can strengthen validity and reliability of the research. Triangulation affords the researcher an opportunity to compare a number of data sources and methods to confirm emergent findings.

In the final third phase of the study, pertinent findings of both the quantitative and qualitative phases were combined and interpreted for the purposes of breadth and depth understanding, corroboration and drawing valid conclusions about the preventative model developed from the key bio-medical and culture based modifiable risk factors of LBP in the Ethiopian context. Figure 4.8 below presented the integration of the first and second phases of the study in a diagrammatic presentation.
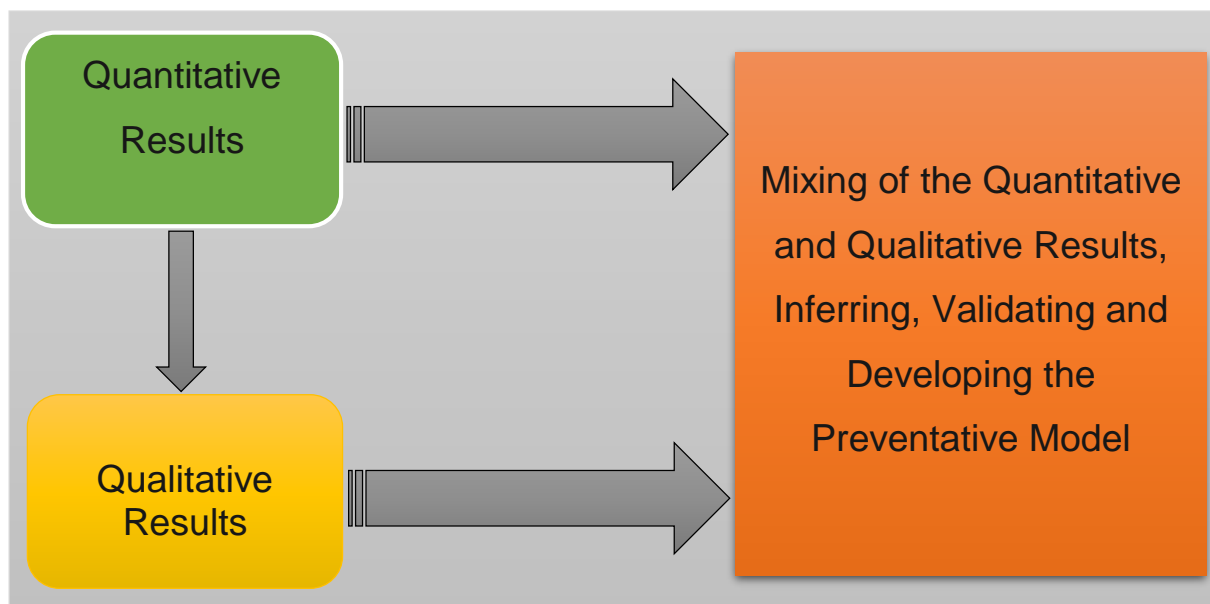
Figure 4.8 Sequential explanatory mixed methods data analysis and interpretation

4.7 SCIENTIFIC INTEGRITY OF THE RESEARCH

Research integrity is defined as an adherence to the professional code of conduct and ethical principles for the study under inquiry (Yin 2010:41). This is concerned with intellectual honesty and the researcher's responsibility for his actions and practices. There are four principles that can be used to know if the research is in line with the fundamental principles of research integrity (ALLEA 2017:3). These are:

1. Reliability refers to the process of ensuring the quality of the research, the design, the methodology, the data analysis and the use of resources.
2. Honesty refers to the process of developing, undertaking, reviewing, reporting and communicating research in a clear, reasonable, full and unbiased method.
3. Respect refers to respecting for research participants, colleagues, society, ecosystems, cultural heritage and the study environment.
4. Accountability refers to the concern of the researcher on the research from its inception to publication and to its wider public impacts.

In this study, the researcher respected his professional code of conduct, social norms and values to maintain scientific rigor. He also followed all stated ethical procedures and

principles with respect to disclosing the findings of the study. The researcher has more than ten years of work experience as a physiotherapist in public and private hospitals. He is honest and fair in all aspects of social and scientific norms. The overall summary of the chapter is outlined in the following section.

4.8 SUMMARY

This chapter discussed the methodology of the study. The Ontological and epistemological approaches were discussed in-detail. The quantitative, qualitative and mixed methodology use within the study, the data gathering processes, and analysis are also presented. The ethical considerations were also presented in each section accordingly. The collected data in the first phase of the study was believed to be more objective and offered accurate information by using a self-developed data collection instrument. The data was analysed using statistical software in order to compute the descriptive and inferential statistics. The findings give representative and broadly generalizable information about LBP.

The data collection and analysis in the second phase took place simultaneously. The second phase of the study gathered textual data from back patients and healthcare providers. The researcher integrated the findings from the quantitative and qualitative phases to ensure more holistic insights. This enabled the researcher to combine pertinent quantitative and qualitative findings for the breadth and depth understanding of complex phenomenon of development of LBP. Finally, emergent data will be used to develop a culturally sensitive integrated preventative model for the prevention of LBP among the population of Addis Ababa.

CHAPTER 5

DATA PRESENTATION AND ANALYSIS: THE QUANTITATIVE PHASE

5.1 INTRODUCTION

The earlier chapter presented the research methodology used by the researcher to address the research objectives. It has briefly discussed the analytical cross-sectional, phenomenological and explanatory sequential study designs. The chapter also highlighted the philosophical views and assumptions within these three types of research designs. In addition, the chapter discussed the methods used in each of the quantitative and qualitative phases of the study in order to collect the data and how the data analysis and interpretation were carried out. Moreover, the chapter briefly presented the processes of maintaining ethical principles, validity, reliability and trustworthiness in detail.

The current chapter presented and analysed results of the quantitative phase of the study generated through the survey, to identify the key modifiable bio-medical and culture-based factors to develop the culturally sensitive preventative model. In this phase, the data was collected through a questionnaire comprising of four important sections that enabled the researcher to answer the research questions regarding the demographic profile of individuals affected by LBP, factors associated with the development of LBP, the prevalence and burden of LBP and the modifiable bio-medical and culture-based risk factors of LBP (See Annexe R). The data collected via this instrument was entered, cleaned, and analysed using a statistical software package and coded variables.

The research objectives and questions were designed based on the bio-medical and health belief models. The study broadly aspired to answer the following six research questions through integrating the two phases. The research questions were:

1) What are the demographic profiles of individuals affected by LBP?
2) What are the factors associated with the development of LBP?
3) What is the burden and severity of LBP?
4) What are the biomedical and culture-based modifiable risk factors for LBP?
5) How do cultural beliefs influence the development of health promoting and health jeopardising behaviours in the development of LBP?
6) What are the key biomedical and cultural factors that support the prevention of LBP?

The first phase of the study (quantitative approach) intended to answer the research questions 1, 2, 3 and 4 to describe the demographic profile of individuals affected by LBP, to identify factors associated with the development of LBP, to ascertain the prevalence and severity of LBP, and to identify the key bio-medical and culture based modifiable risk factors of LBP based on the back patients' perspectives. The next subsection presented the results of the first phase of the study.

5.2 DATA ANALYSIS AND PRESENTATION OF THE QUANTITATIVE PHASE

In this phase, the researcher aimed to include 171 participants. However, due to the use of systematic random sampling method at the final step, 170 study subjects were included in the study with a response rate of 99.4%. This is an appreciably high response rate for the weighted sample size calculation (Bernard 2011:141). The main reasons for non-response rate were either unavailability at their follow-up clinics or refusal to take part in the study. For that reason, the final analysis was done for 170 study participants.

The questionnaire contains six (6) sections: socio-demographic variables, lifestyle risk factors, work-related risk factor questions, psychosocial risk factor inquiries, cultural factors questions and constructs of the health belief model. The analysis and presentations of the findings follow the objectives of the study as the demographic profiles of individuals affected by LBP, factors associated with the development of LBP and the burden and severity of LBP. Finally, the constructs of the health belief model are presented in a separate aspect at the end of the section.

5.2.1 The demographic profile of individuals affected by low back pain

The demographic profile included questions related to age, gender, religion, marital status, number of children, educational level, ethnicity, type of house used to live and occupation of the respondents. These demographic variables are presented in the following sub sections and will form the basis for the cross tabulations during the analysis of the data.

5.2.1.1 Age

The mean age of the respondents was 44.35 years and standard deviation ± 14.36 years. It also ranges from 18 to 81 years old. Seventy-one (42%) of the respondents were between

45 and 64 years of age and seventy (41%) were between 25 and 44 years of age. Table 5.1 below summarises the age distribution of individuals affected by LBP.

Table 5.1 Age distribution of the respondents

Age category	Frequency (N=170)	Percent	Cumulative %
18-24	14	8.2	8.2
25-44	70	41.2	49.4
45-64	71	41.8	91.2
65+	15	8.8	100.0

5.2.1.2 Gender

Eighty-six (50.6%) and eighty-four (49.4%) of the respondents were male and female respectively. The cross tabulated result between the age group and gender of individuals affected by LBP indicated that 46.4% (n=39) of female individuals affected by LBP were concentrated in the age group 25-44 years, which is followed by male individuals aged 45-64 with a proportion of 45.3% (n=39). In general, Individuals aged between 25-64 account for about 83 per cent (n=141) of the total individuals affected by LBP. Table 5.2 below compares the age distribution and gender of individuals affected by LBP.

Table 5.2 Distribution of individuals affected by LBP by age and gender

Age Category		Individuals affected by LBP		
		Male	Female	Total
18-24		8.1 (7)	8.3 (7)	8.2 (14)
25-44		36.0 (31)	46.4 (39)	41.2 (70)
45-64		45.3 (39)	38.1 (32)	41.8 (71)
65+		10.5 (9)	7.1 (6)	8.8 (15)
Total	Number	86	84	170
	Percent	100.0	100.0	

5.2.1.3 Religion

The vast majority 128 (75.3%) of the respondents were Orthodox followers. The remaining were Muslims, Protestants and did not follow any religion. Figure 5.1 below presents the frequency distribution of the religion of the respondents.
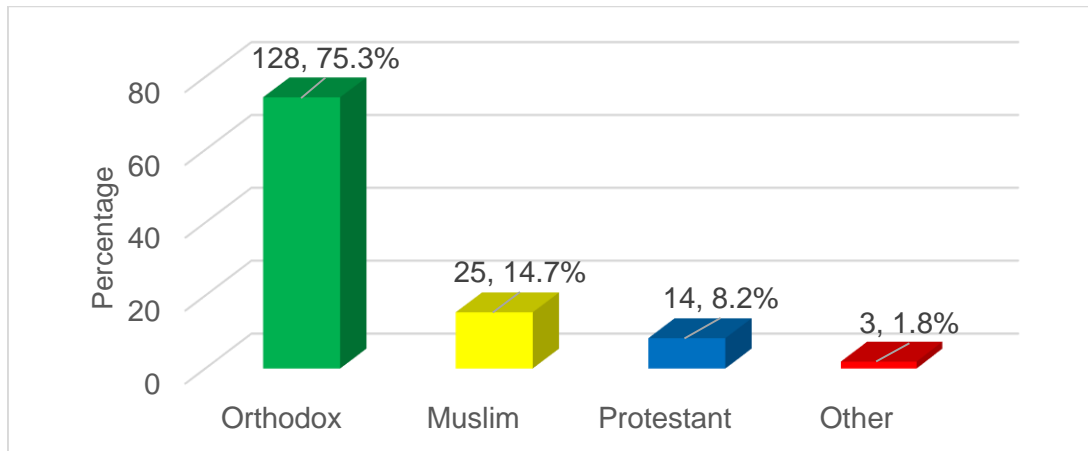
Figure 5.1 Religion of individuals affected by low back pain (N=170)

5.2.1.4 Marital status

More than half 101 (59%) and about one-third 52 (31%) of the participants were married and single respectively. The two categories consist of almost 90% of the study participants. Figure 5.2 below presents the marital status of the participants.
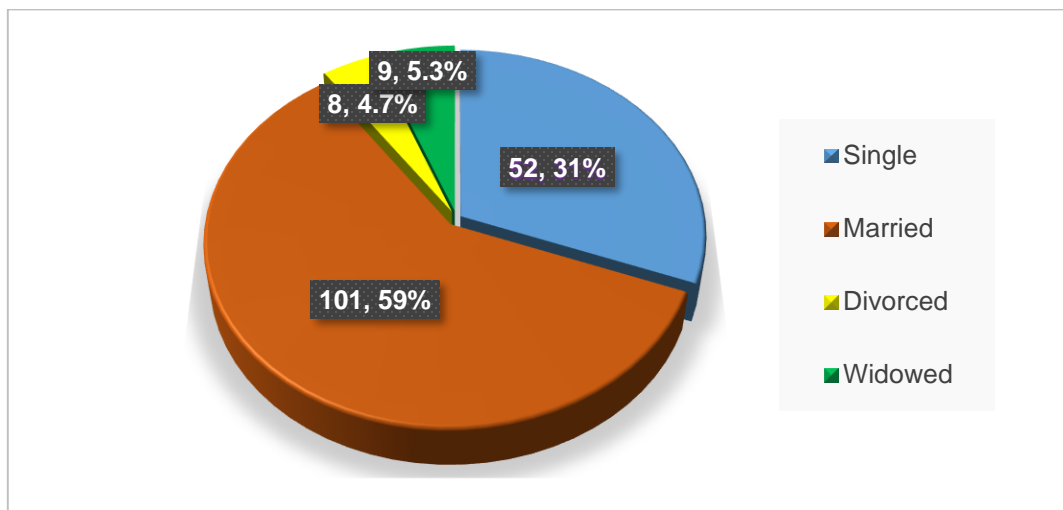
Figure 5.2 Marital status of individuals affected by low back pain (N=170)

5.2.1.5 Number of children

With respect to the number of children, the mean average number of children of the respondents were 3.11 with standard deviations ± 1.676. The majority 131 (77.1%) of the participant had at least one or more children and above one-thirds 57 (33.5%) had either three or four children. Table 5.3 summarises the number of children of the respondents.

Table 5.3 Number of children of the respondents (N=170)

Number of Children	Number	Percent
None	*39*	22.9
1-2	51	30.0
3-4	57	33.5
5 or more	23	13.5
Total	170	100.0

5.2.1.6 Educational level

More than half 104 (61.9%) the respondents had completed post-secondary education, a little above one-fifth 37 (21.8%) had some secondary education, and the remaining 27 (15.9%) had low educational achievement (never joined school or attended primary school). Figure 5.3 below presents the highest educational level of the respondents.
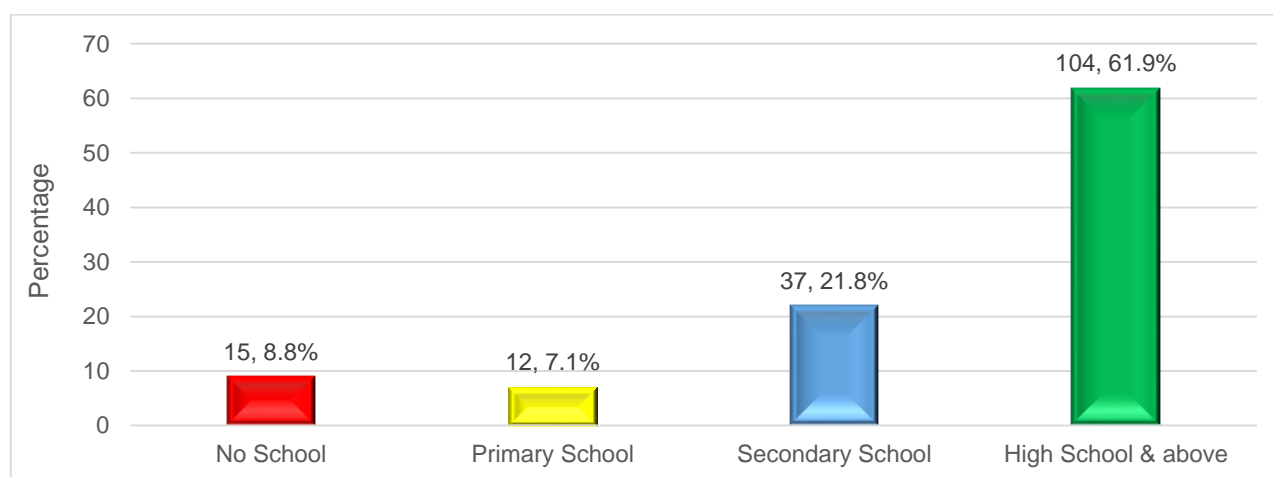
Figure 5.3 Educational level of the respondents (N=168)

5.2.1.7 Ethnicity

Above one-third, 68 (40%) of the respondents belonged to the Amhara ethnic category and forty-five (26.5%) were from the South Nations Nationalities and Peoples (SNNP) ethnic group. The remaining participants were from the Oromo, Tigre and *"Ethiopian"* ethnic backgrounds. However, there is no separated *"Ethiopian"* ethnic group in Ethiopia. Some respondents responded by saying they were from the *"Ethiopian"* ethnic background due to the present ethnic-oriented political condition of the country. Figure 5.4 below illustrates the frequency distribution of the ethnicity of respondents.
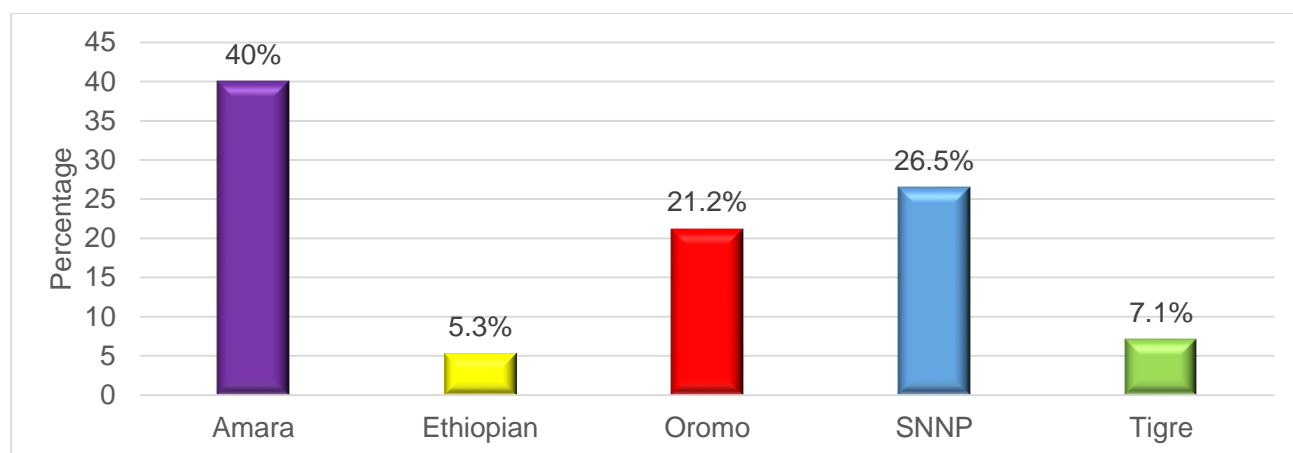
Figure 5.4 Ethnicity of individuals affected by LBP (N=169)

5.2.1.8 Type of house

With respect to the type of house used to live, 92 (54.1%), 75 (44.1%) and 3 (1.8%) of the respondents were living on their own, in rented accommodation and others respectively. Figure 5.5 below shows the type of house used by the respondents.
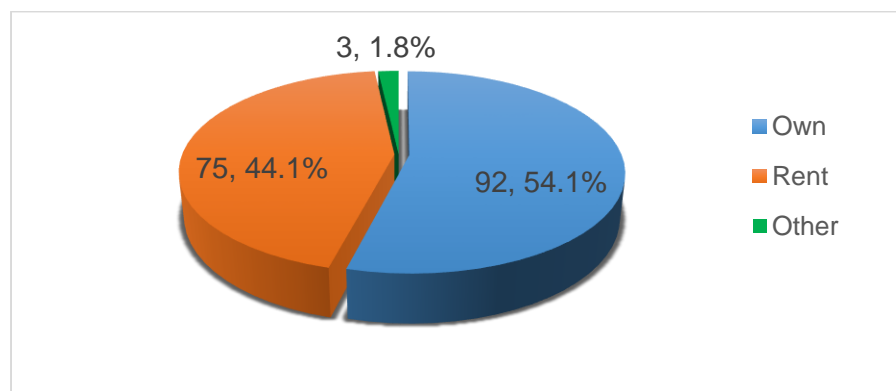
Figure 5.5 Type of house used to live by the respondents (N=170)

With respect to occupation, seventy-eight (45.9%) were civil servants and another twenty-four (14.1%) were self-employed in the informal sector. Back patients who were unemployed (not participated in any form of waged or unpaid work) accounted for 5.3 per cent of the total respondents. However, twenty-nine (17.1%) of surveyed individuals were housewives who were neither employed in civil organisation nor participated in any work. Daily labourer individuals affected by LBP were thirteen (7.6%). Table 5.4 below shows the employment status of individuals affected by LBP.

Table 5.4 Employment status of individuals affected by LBP

Employment status	Frequency (N=169)	Percent	Cumulative %
Employed	78	46.2	46.2
Unemployed	9	5.3	51.5
Self-employed	24	14.2	65.7
Student	4	2.4	68.0
Housewife	29	17.2	85.2
Labourer	13	7.7	92.9
Retired	10	5.9	98.8
Other	2	1.2	100.0

5.2.2 Factors associated with the development of low back pain

This section was categorised into four (4) sections: lifestyle factors, work-related factors, psychosocial factors and cultural factors. The presentation of the findings will follow the sequence of sections as mentioned above.

5.2.2.1 Lifestyle factors

The lifestyle factors that were measured in this section were exercise habits, frequency of exercise, sleeping material, type of mattress, duration of sleep and transportation mode. The findings of these variables are presented in the following subsections.

5.2.2.1.1 Exercise habit

The respondents were asked whether they had participated in any type of exercise programme. One hundred twenty-four (73%) of the respondents had poor exercise habits and 46 (27.1%) of the respondents indicated that they had good habit for the exercise programme.

5.2.2.1.2 Frequency of exercise programme

Those who had good exercise habits were further asked to mention for how many times per week they attended. The mean average exercise days per week they participated were 3.04 with standard deviation ± 1.619 days.

5.2.2.1.3 Sleeping material

Respondents were asked to mention the type of sleeping materials they commonly used to sleep. Among the most commonly used sleeping materials of the respondents for sleeping was bed 119 (70%), mattress on the floor 44 (25.9%) and others 11 (6.5%).

5.2.2.1.4 Type of mattress

The respondents were probed to tell the type of mattress they used to sleep. More than half 87 (51.2%) of them used a soft mattress, 72 (42.4%) of them were used firm type of mattress and the remaining 11 (6.5%) of the respondents were utilised other type of mattresses (extra bonded or orthopaedic mattress). The following diagram diagrammatically represents the type of mattresses used by the respondents.
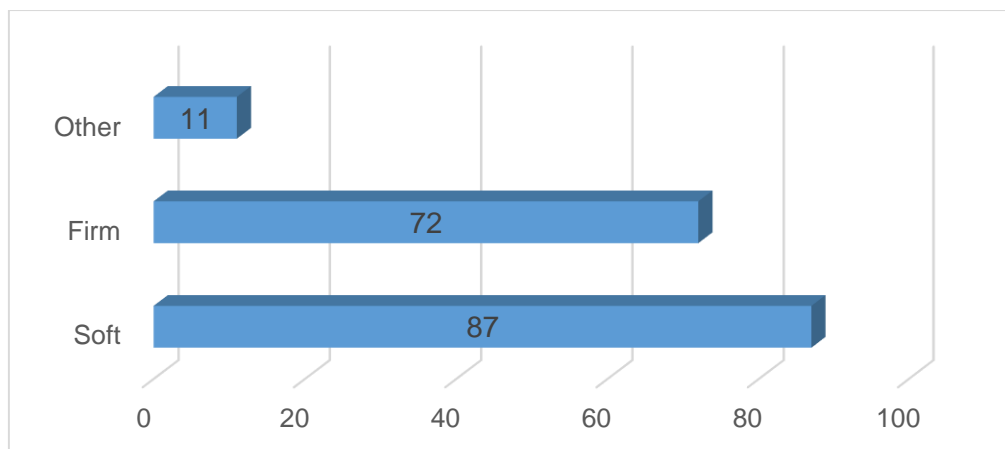
Figure 5.6 Type of mattresses used by the respondents (N=170)

5.2.2.1.5 Duration of sleep

The respondents were asked the duration of their sleep. The average duration of sleep of the respondents was 6.77 hours with a standard deviation of ± 1.998 hours with a minimum of 1 hour and maximum of 12 hours. More than half 92 (54.4%) of them were sleeping for 7 to 9 hours, 67 (39.6%) were sleeping for ≤ 6 hours and the rest 10 (5.9%) were sleeping for ≥ 10 hours. Nearly 40% of individuals with LBP had poor sleeping habit, while 6% had the ability to sleep more than the average nightly sleeping hours. The Pearson's correlation coefficient showed that there was a statistical association between age of the respondents and duration of sleep ($r = -0.157$, $P = 0.041$). This suggests that as age of the respondent increases, duration of sleep decreases. Table 5.5 presents the duration of sleep of the respondents.

Table 5.5 Duration of sleep of the respondents

Duration of sleep*	Frequency (N=169)	Percent	Cumulative %
≤ 6 hours	67	39.6	39.6
7-9 hours	92	54.4	94.1
≥ 10 hours	10	5.9	100.0

Classified based on the National Sleep Foundation new sleep times for adults (NSF, 2015).

5.2.2.1.6 Transportation mode

The respondents were asked the type of transportation mode they commonly used to travel. Among the responses both taxi and bus, taxi, and bus, were the predominant responses mentioned by 87 (51.2%), 44 (25.9%) and 23 (13.5%) of the respondents respectively. Details of their replies are presented in Figure 5.7 below.

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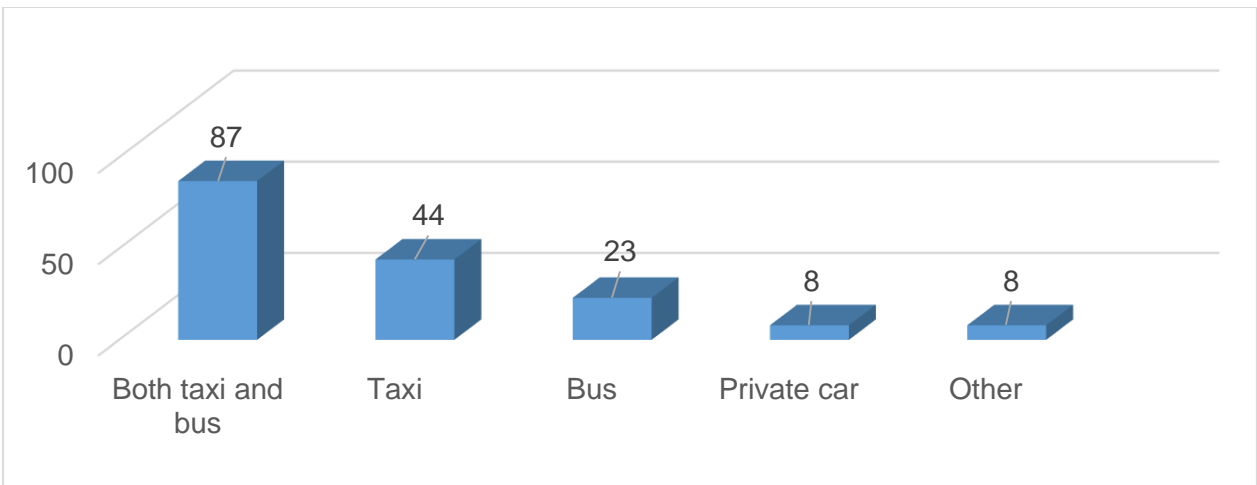
Figure 5.7 Types of transportation mode used by the respondents (N=170)

5.2.2.1.7 Chi Square analysis of lifestyle risk factors in relation to socio-demographic characteristics

Socio-demographic features are key variables that observe the data for an association with each other because there is no outcome variable for this study i.e. all study subjects had the outcome variable (low back pain). Therefore, the socio-demographic variables of the respondents were examined to observe if any association exists within the lifestyle risk factors for LBP.

- Exercise habits

The cross-tabulations between selected demographic profiles and exercise habit shows that 28.6% (n=20) of back patients who had good exercise habits in line with a specific exercise programme were between the age group of 25-44 years, which is followed by those aged between 45-64 with a proportion of 25.4 per cent (n=18). However, younger individuals aged between 18-24 years (35.7%; n=55) had better exercise habits than older individuals aged above 65 years (20%; n=3). The researcher also noted that, good exercise habits decrease as age increases. Similarly, male back patients (37.2%; n=32) had better exercise habits than female back patients (16.7%; n=14). This implies that males are approximately twice as likely to take part in an exercise program than their female counterparts.

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Single individuals (32.7%; n=17) with back pain had higher interest in exercise programmes than their married counterparts (25.7%; n=26). However, 58% (n=15) of married individuals with LBP attended any type of exercise programme three times a week, while 53% (n=9) of single individuals joined exercise programme for less than three times a week. On the other hand, divorced or widowed individuals did not participate in any form of exercise programme (87.5% and 77.8%, respectively). Whereas, individuals with LBP who had attended post-secondary school (30.8%; n=32) did participate in an exercise programme more than individuals who had not attained any education (26.7%; n=4). Conversely, 24.3% (n=9) of individuals who had participated in exercise programmes had attended secondary school. This suggests that educated individuals have higher involvement rates in exercise programmes than their less educated counterparts.

The findings of this section were further analysed and presented using the chi square test in order to determine the existence correlations between the lifestyle variables of the study with the selected demographic profile of individuals. The study results showed that there was a high correlation between the respondent's gender and exercise habit (χ^2=9.086, P = 0.003, COR 2.96; 95% CI (1.44-6.096). Female back patients were 3 times more likely not to be interested to participate for an exercise programme compared to male back patients.

- Sleeping material

The highest proportion of respondents who used a bed as a sleeping material between 45-64 years of age (78.9%; n=56), while 32.9% (n=23) of individuals used mattress only (spread on the floor) were between 25-44 years of age. Individuals aged above 25 years preferred to use the bed as a sleeping material, while younger individuals between 18-24 years of age reported that they used both a bed and/or a mattress on the floor. The highest proportion (77.9%; n=67) of male individuals with LBP who used a bed as a sleeping material than female individuals (61.9%; n=52). Whereas, nearly thirty-three per cent (n=28) of woman back patients preferred to sleep on the floor than nineteen per cent (n=16) male back patients. The proportion of respondents who used the bed as a sleeping material was non-significant in all the categories of marital status and educational level of the respondents.

- Type of mattress

With regard to the type of mattress used to sleep, both male and female individuals with LBP preferred to use soft mattresses as a sleeping material than a firm mattress. However, male back patients (46.5%; n=40) reported using a firm mattress more than female back patients (38.1%; n=32). Respondents aged between 45-64 years old, reported that they preferred to sleep on a firm mattress (47.2%; n=34) than those aged between 25-44 years (36.4%; n=26). However, younger individuals aged between 18-24 years (11.5%; n=10) preferred to sleep on a soft mattress than older individuals aged above 65 years (5.7%; n=5). Nearly 60% of married respondents used either soft or firm (n=101) types of mattresses for sleeping than single, divorced or widowed individuals. Similarly, back patients who had attended high school and above, were used to using a firm mattress (62.5%; n=45) than any other group of back patients.

- Transportation mode

The percentage of back patients and type of preferred use of transportation mode was non-significant in all the categories of age grouping, gender and marital status. Respondents who had attained high school and above (54.8%; n=57) used both taxi and bus as a transportation method than those respondents who had reached secondary school (51.4%; n=19). However, individuals who had a primary education (41.7%; n=5) were more likely to use bus as a transportation method than those who had not attained any school (20%; n=3). Here, it is important to imply that the higher the educational level of individuals with back pain, the more likely they are to choose more than one mode of transportation. There was also statistical significance between age of the respondents and transportation method (χ^2=22.052, P = 0.037). The highest correlation was noted on the educational level of respondents in relation to the type of sleeping material used to sleep (χ^2= 34.181, P < 0.001). While a borderline correlation was noted on the educational level of the respondents and the transportation method used to travel from one place to another (χ^2 =21.642, P = 0.042).

In general, exercise habits, type of mattress and transportation mode indicated a statistical association with the demographic profile of back patients. In order to prevent the incidence of LBP, it is important to understand the lifestyle factors that predisposed to LBP. Exercise habit and transportation method showed significance association with the demographic

profile of back patients. This finding is consistent with other studies conducted in hospital settings where poor exercise habit prone to LBP (Brady et al 2016:1; Lionel 2014:2 & Abebe, Gebrehiwot, Lema & Abebe 2015:188). Individuals who are not able to attend an exercise programme for more than half an hour, were at increased risk of developing LBP.

Some authors also noted that transportation method and type of sleeping material have been linked with the development of LBP. Persons who used to travel by bus have a lower risk for LBP than individuals who have preferred to use taxis. Similarly, utilising a medium firm mattress has the ability to reduce level of pain and disability caused by LBP. But a study conducted by Ogunbode, Adebusoye and Alonge (2013:7) failed to get any association between type of sleeping material used by individuals and the development of LBP. Therefore, this finding was explored further in the qualitative phase of the study through interviews with back patients and healthcare providers.

5.2.2.2 Work-related risk factors

Respondents were asked seven questions which were directly related to their prior work-related activities. These questions were included job satisfaction, lifting heavy loads, sitting for more than half an hour, standing for more than an hour, history of workload on their working environment, whether their working environment was suitable for them or not and any type of movement patterns used to perform their activity. The frequency distribution of these questions is presented in Table 5.6 below.

The survey shows that more than 45% (14.9% no and 31% no response) of individuals with back pain were not satisfied with their job or did not provided their answer. More than half 90 (52.9%) of the respondents had lifted weights greater than ten kilograms. Similarly, more than three-fourth 131 (77%) of individuals with LBP had history of prolonged sitting and nearly half 83 (48.8%) of them had history of standing for more than half an hour.

Of 170 respondents, 53.3% of the respondents believed that they had workload on their working environment. Among them, 35.1% indicated that their working environment was not suitable to accomplish their tasks. Of these, more than half of them (58.2%) had history of awkward body posture. However, 42% of individuals affected by LBP reported that their work required some sort of body movement patterns. The majority of them indicated that their job required pushing or pulling (30.7%) and lifting of weights (29.1%).

Table 5.6 The work-related risk factors of low back pain

Work-related factors		Frequency	Percent
Job satisfaction	Yes	91	54.2
	No	25	14.8
	No response	52	31.0
Heavy load	Yes	90	52.9
	No	80	47.1
Prolonged sitting	Yes	131	77.1
	No	39	22.9
Prolonged standing	Yes	83	48.8
	No	87	51.2
Workload	Yes	90	53.3
	No	63	37.3
	No response	16	9.5
Suitable working environment	Yes	59	35.1
	No	87	51.8
	No response	22	13.1
Awkward body posture	Yes	99	58.2
	No	50	29.4
	No response	21	12.4
Movement patterns	Yes	72	42.4
	No	98	57.6
Type of movement patterns	Pushing/Pulling	61	30.7
	Vibration	35	17.6
	Lifting of weights	58	29.1
	Kneeling or squatting	34	17.1
	Bending & twisting	11	5.5

5.2.2.2.1 Job satisfaction

With regard to job satisfaction of the respondents, 69.6% (n=48) respondents aged between 25-44 years reported that they were satisfied with their job, while respondents aged between

45-64 years indicated that they were satisfied with their job (46.5%; n=33). Sixty-three per cent (n=53) of males compared to female (45.2%; n=38) back patients, who reported that they were satisfied with their career. Respondents who had attended above high school (64.1%; n=66), married individuals (58%; n=58) and those whose ethnic background was reported as Amhara (57.4%; n=39) reported that they were satisfied with their job than any other group.

5.2.2.2.2 Prolonged sitting

The proportion of respondents who had history of prolonged sitting was non-significant across all the categories of gender, marital status and educational level. Respondents aged between 45-64 years indicated that they had histories of sitting for more than half an hour in their working environments (85.9%; n=61). There was also a difference in the type of house lived in with regard to prolonged sitting, where respondents who lived in their own houses scored higher than those who lived in rented accommodation (83.7%; n=77 and 69.2%; n=54).

5.2.2.2.3 Sustained workload

The proportion of respondents' sustained workload in their working environment was non-significant in all the categories of age, gender and marital status of the respondents. Respondents who attended high school and above reported that they had a sustained workload on their working environment (53.8%; n=56) than other respondents. Sixty-one per cent (n=55) of respondents who were satisfied with their job indicated that they had a sustained workload within their work setting.

5.2.2.2.4 Unsuitable working environment

The percentage of respondents who had inappropriate working environments was non-significant across all the categories of age, gender, and marital status of the respondents. Sixty-one per cent (n=55) of respondents who were satisfied with their job indicated that they had a sustained workload within their work setting. Respondents who had studied up until high school and above (57.7%; n=60) reported that their work environment was not suitable for them to accomplish tasks. Fifty-five per cent (n=49) of the respondents who were satisfied with their job indicated that their work environment was not suitable for them.

5.2.2.2.5 Awkward body posture

The percentage of respondents who had exposure to awkward body posture (twisting, bending, and overreaching) within their work environments was non-significant across all the categories of age, gender, marital status and educational level of the respondents. Respondent who had satisfied with their job (62.6%; n=57) indicated that they were exposed to awkward body posture on their working environment.

5.2.2.2.6 Movement patterns

With regard to the movement patterns that requires the lumbar spine to bend, flex and extend, 65.7% (n=46) of respondents who were aged between 25-44 years reported that their work needed either pushing, pulling or lifting. Respondents who had children (53.4%; n=70) reported that their work required some sort of movement patterns. Respondents from the Oromo ethnic background (69.4%, n=25) reported that they were exposed to pushing, pulling or heavy load lifting than any other ethnic group. Individuals who were living in rented accommodation (69.2%, n=54) reported that their work required pushing, pulling or vibration forces than those individuals living in their house. Daily labour respondents (92.3%; n=12) reported that their work involved pushing, pulling or lifting loads.

The chi square test was done for all work-related factors in order to make any association with the selected demographic profile. Two of the work-related factors were statistically significant in relation to the age of the respondents; while the other one was borderline and the remaining five were not significant. Job satisfaction of individuals affected by LBP indicated the correlation with age of the respondents (P = 0.003; χ^2= 20.059; df= 6), same as the movement pattern (p=0.001; χ^2= 17.645; df=3). The work-related factors that showed borderline association included "prolonged sitting" with age of the respondents (p= 0.045; χ^2=7.620; df=3). While individuals whose job required "sustained standing" for more than an hour; workload; unsuitable working environments and awkward body posture, were not statistically significant in relation to the respondents' age categories.

Gender of the respondents and job satisfaction yielded a borderline correlation (χ^2=5.663, P = 0.059). The other six work-related factors were not shown any statistically significant with gender of the respondents. Educational level of the respondents was statistically significant when cross tabulated with job satisfaction (χ^2=30.668, P < 0.001), workload (χ^2= 20.749, P

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= 0.002), and suitable working environment (χ^2=17.815, P = 0.007). There was no statistical correlation between educational level of the respondents and prolonged sitting; prolonged standing; awkward body posture and movement patterns (P > 0.05).

Ethnicity of the respondents had association with job satisfaction (χ^2=16.496, P = 0.036) and movement patterns (χ^2=9.704, P = 0.046). Moreover, the type of house used to live had correlation with prolonged sitting (χ^2=4.996, P = 0.025), prolonged standing (χ^2= 4.537, P = 0.033) and movement patterns (χ^2= 7.921, P = 0.005). Also, occupation of the respondents had high correlation with patterns of movement (χ^2= 24.596, P = 0.001) and having children (χ^2= 4.149, P = 0.042) had a borderline significance when cross tabulated with movement pattern.

Different authors summarised that prolonged sitting, job satisfaction, repetitive trunk rotations, awkward postures, workload, and unsuitable working environment are the major work-related risk factors for LBP (Bener et al 2014:234; Falavigna et al 2015:359; Garcia et al 2014:379; Sinha AP 2017:933; Yang et al 2016:459 & Yilmaz & Dedeli 2012:608). Similarly, Zungu and Nigatu (2015:18) indicates the association between different movement patterns, awkward body postures and pushing of heavy loads with the development of LBP.

Occupation that needs to deviate from the normal anatomic posture, sitting for more than half an hour and working in unsafe environment could lead to LBP. Older individuals preferred to perform their day-to-day tasks in a static position compared to younger individuals who preferred to operate in a more active and dynamic environment. In addition, the educational background of individuals determines the level of stresses arisen from the working environment. They could further make their working environment suitable for their body. From this finding, it was also evident that respondents with higher educational background (high school and above) were more satisfied with their job. Therefore, it was better to further explore in-depth, the mechanisms related to the development of LBP due to job dissatisfaction, prolonged sitting, exposure to workload and unsuitable working environment from the back patients and healthcare providers' perspectives.

The researcher further explored the modifiable work-related factors of LBP in order to assist in the development of the anticipated preventative model. In addition to this, the level of

knowledge on back ergonomics and its application on the working environment was also explored in-detail during in-depth interviews with back patients.

5.2.2.3 Psychosocial risk factors

Those psychosocial risk factors of LBP identified from different literature sources. Data was generated on these identified variables for further analysis and presented in the following sections. More than half 97 (57.1%) of the respondents had no time for relaxation. However, about 26% of individuals with back pain were not interested to attend social programmes. The majority 119 (70%) of the respondents felt depressed or hopeless, 107 (62.9%) perceived that their back pain was due to their job and 73 (42.9%) of study participants believed that their pain developed as a result of an accident. Nearly two-thirds 109 (64.1%) of the back patients had difficulties to deal with the stress of daily life. The frequency distribution of psychosocial risk factors is shown in the following table.

Table 5.7 Psychosocial factors of low back pain

Psychosocial risk factors		Frequency	Percent
Time for relaxation	Yes	73	42.9
	No	97	57.1
Attend social programmes	Yes	125	74.0
	No	44	26.0
Feel depressed or hopeless	Yes	119	70.0
	No	51	30.0
Job is the main cause of pain	Yes	107	62.9
	No	47	27.6
	No response*	16	9.4
Accident is a cause of pain	Yes	73	42.9
	No	97	57.1
Deal with stress of daily life	Yes	109	64.1
	No	61	35.9

Either they did not have jobs, or they were not able to remember a job as a cause of the pain.

5.2.2.3.1 Time for relaxation

Respondents who were aged above 65 had enough time for relaxation (73.3%; n=11) while, respondents aged between 25-44 years (64.3%; n=45) reported that they had no time for relaxation. The highest percentage of female back patients (59.5%; n=50) reported that they had no time for relaxation, and 54.7% (n=47) male back patients had no time for relaxation programme. Similarly, married respondents (62.5%; n=58) than single respondents (55.8%; n=29) had no time for relaxation. Likewise, respondents who had attended high school and above (61.5%; n=64) had no time for relaxation.

5.2.2.3.2 Attending social programmes

The percentage of respondents who were not able to attend social programmes was non-significant across all the categories of age and gender of the respondents. Respondents who were not married reported that they did not attend any type of social programmes (32.7%; n=17). Thirty-two per cent (n=8) of Muslim followers were not capable to attend social programmes. Nearly 33% (n=5) individuals who had not attended any formal school programme were not able to attend social gatherings. Regarding to the crosstabulation result of the ethnic background and social gatherings, individuals from SNNP ethnic background were not able to attend social gatherings (51.1%%; n=23) than any other groups. Though, back patients who were living in the rent house had higher proportion of difficulties to attend social programmes than individuals living in their house (37.2%; n=29 versus 16.5%; n=15).

5.2.2.3.3 Feel depressed or hopeless

The proportion of the respondents who felt depressed or hopeless did not show any significant association with the demographic variables of the study.

5.2.2.3.4 Job and accident as a cause of low back pain

The percentage of respondents who thought that their job was the main cause for the development of LBP was non-significant across all the categories of age, gender and marital status of the respondents. Respondents, who attended primary school, blamed their job as the main cause for their pain (91.7%; n=11), while 37% (n=39) of the respondents who had reached high school and above indicated that their pain was occurred due to accident. On

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the other hand, 78.4% (n=29) of individuals who had attended secondary school reported that they were not able to deal with the stress of daily life.

The correlation was evident in the cross tabulation of age and time for relaxation (χ^2= 10.106, P = 0.018) followed by correlation between attending social programmes and religion (χ^2=9.970, P = 0.019), ethnicity (χ^2= 21.431, P < 0.001) and type of house used to live (χ^2= 9.342, P = 0.002). The correlation with educational level of respondents and job (χ^2= 28.849, P < 0.001) and accident as a cause of LBP (χ^2= 8.989, P = 0.029) was significant, while dealing with stress of daily life showed borderline significance (χ^2=7.429, P = 0.059 The statistical analysis showed no correlation between other selected demographic profiles of individuals with the psychosocial risk factors of LBP.

The statistical test indicated that older individuals had more time for relaxation and were able to attend any type of social gatherings compared to younger individuals. This is further reinforced by those individuals who had a better spiritual life and preferred to live life easily by relaxing with their families and friends. This finding is in line with a study done by Chidobe et al (2017:779) who stated that individuals with positive spiritual and cultural beliefs had better coping mechanism for their pain. The researcher was explored these variables further in the second phase of the study utilising open-ended questions in order to have a detailed explanation of the influence of cultural beliefs on the development of LBP and to understand the reasons why individuals who have no time for relaxation and poor spiritual life had an increased predisposition to LBP.

5.2.2.4 Socio-cultural factors

The questions on the socio-cultural factors measured in these sections were sedentary lifestyle, using technology, life expectations, religious belief, overcrowding in the living area, and familial fighting at home. In this report, religious belief as a risk factor of LBP was excluded as a variable for data analysis as there was only one (1) respondent who said 'yes' for the survey. Table 5.8 below shows that 45% (n=76) of the respondents thought that their sedentary lifestyle was linked to the occurrence of their pain, while the remaining 55% (n=94) did not reflect that sedentary lifestyle caused their pain. Similarly, a fifth 37 (21.8%) of back patients perceived that using technology might cause their LBP. On the other hand, more than three-fourth 133 (78.2%) of the respondents did not reflect that using technology might

have exposed them to back pain. Nearly 63% (n=107) of them did not live the way they wanted to live, while the remaining 37% (n=62) of individuals affected by back pain were living the way they wanted. More than half 89 (52.4%) of the respondents had reported overcrowding around their village, and nearly one-quarter 41 (24.1%) of back patients encountered familial fighting at their home. Table 5.9 presents the influence of cultural beliefs on the development of LBP.

Table 5.8 Socio-cultural factors for the development of LBP

Socio-cultural factors		Frequency	Percent
Sedentary lifestyle	Yes	76	44.7
	No	94	55.3
Using technology as a cause of LBP	Yes	37	21.8
	No	133	78.2
Life expectations	Yes	62	36.7
	No	107	63.3
Over-crowding in their village	Yes	89	52.4
	No	81	47.6
Familial fighting	Yes	41	24.1
	No	129	75.9

5.2.2.4.1 Sedentary lifestyle

The cross tabulated findings between cultural beliefs and selected demographic profiles indicated that 60% of individuals aged between 45-64 years thought that their pain was a result of their lifestyle. The highest proportion of women (48.8%; n=41) than men (40.7%; n=35) described that the development of their pain was related to the lifestyle they followed. Similarly, married individuals (45.5%; n=46) with LBP perceived that their pain was due to their lifestyle, while 44 per cent (n=30) of single back patients believed that their pain was a result of the routines within their lifestyle.

The highest proportion of individuals who had not attended any formal school (60%) perceived that their pain developed due to their day-to-day lifestyle, whereas, nearly 42% of

individuals who had attended at least primary school observed that their pain was a result of their lifestyle. On the other hand, 68% (n=17) of individuals who were not satisfied with their job indicated that their pain was due to their daily activities, while 40% (n=36) of individuals who reporting enjoying their job reported that their pain was linked to their lifestyle.

5.2.2.4.2 Utilising technology

With respect to age and the occurrence of LBP as a result of utilising technology, a higher percentage of younger individuals aged between 18-24 years (42.9%; n=6) than any other group specified that their pain was developed due to using technology. Likewise, 26% (n=22) of males compared to the female (17.9%; n=15) back patients reported that their pain was a result of their use of modern technology. Similarly, single back patients (30.4%; n=21) indicated that their pain was due to using technology compared to their married individuals (15.8%; n=16). Back patients with no children (46.2%; n=18) believed that their pain was due to using technology, but 15% (n=19) of back patients who have children thought that their pain was developed due to using technology. Individuals who have attended high school and above (26.9%; n=28) perceived that their pain was due to using modern technology.

5.2.2.4.3 Life expectations, overcrowding and familial fighting

There is no association between life expectations and familial fighting with age categories, gender, marital status and educational level. In terms of life expectations and type of house, the highest percentage (72.7%; n=56) of individuals with LBP lived in rent accommodation and were not living the way they expected to live, while 55.4% (n=51) of individuals who lived in rented accommodation house confirmed that their life expectations remained unmet.

There was a statistically noteworthy association between overcrowding around their village with age category and type of house used to live. The cross tabulated results between age category and overcrowding indicated that aged between 25-64 years of individuals with LBP reported that there was over-crowding around their village (92.3%; n=82). Whereas, almost 63% (n=49) of individuals who lived in rented accommodation, reported that there was overcrowding within their areas than those people who lived in their own home (43.5%; n=40). In relation to job satisfaction and any association with familial fighting at home, 36% (n=9) of individuals who were not satisfied with their work indicated that there was a familial

fighting at their home than seventeen per cent (n=15) individuals who were satisfied with their job.

The findings from the chi square analysis showed the correlation between age category of the respondents and influence of cultural beliefs on LBP. The strongest correlation was observed with the respondents' age and sedentary lifestyle (χ^2= 12.934, P = 0.005), overcrowding around their village (χ^2= 14.970, P = 0.002), and using technology (χ^2= 8.495, P = 0.037). Age of the respondents did not show statistical significance and neither did "life expectations and familial fighting" of the respondents (P > 0.05).

There was a strong association between marital status of respondents and using technology (χ^2= 11.299, P = 0.010) and number of children of the respondents and using technology (χ^2= 17.680, P < 0.001). There was no statistical significance between marital status of the respondents and the other four measured cultural risk factors in this section. The results also noted that there was a high correlation between ethnicity of back patients and overcrowding around their village (χ^2= 17.995, P = 0.001). The strongest correlation was also observed between the respondents' type of house lived-in and life expectations (χ^2= 5.396, P= 0.020) and overcrowding around their village (χ^2= 6.331, P = 0.021). There was a marginal correlation between job satisfaction of the respondents' and familial fighting (χ^2= 6.129, P = 0.047). The respondents' gender and educational level did not show statistical significance with the cultural beliefs of the respondents that were measured during this phase.

Perception of pain is a complex phenomenon, which is influenced by sedentary lifestyle and family structure. This is congruent with a study done by Rodrigues et al (2016:1) mentioned that family structure and social environment are the modulator of low back pain. Sedentary lifestyle, overcrowding, and domestic violence are predictors of LBP in our setting. Similarly, using different types of technologies could predict future occurrence of LBP. Even if the researcher noted a positive association between these cultural factors with the development of LBP, he did not know in what way does cultural beliefs influence the development of health promoting and health jeopardising behaviours in the development of LBP. Therefore, in order to answer this question, the researcher carried additional explorations with back patients and during healthcare providers' interviews.

5.2.3 The burden and severity of low back pain

5.2.3.1 The prevalence of low back pain

The prevalence of LBP was estimated based on the secondary data obtained from the data registration booklet found at HMIS, and from the quality and head nurse office. The total number of patients attending each department was collected from the 'OPD Registry Form'. During extraction period, the researcher noticed around five different diagnostic entities for LBP (lumbar spondylosis, lumbago, sciatica, lumbosacral radiculopathy, and LBP) and all cases were counted in order to estimate the prevalence of LBP. Based on this, the one-year prevalence of LBP at the public hospitals ranged from 26.4 per cent to 46.3 per cent. The highest prevalence of LBP was recorded at Zewditu Memorial Hospital, Physiotherapy Department, which was 46.3 per cent. This is followed by Neurosurgery Department with the occurrence rate of 35.6 per cent, while 29.5 per cent of LBP was registered at Tikur Anbessa Hospital, Physiotherapy Department and 26.4 per cent was obtained at Neurology Department. Therefore, the estimated one-year prevalence of LBP in Addis Ababa public hospital is around 31.2 per cent.

Overall, the prevalence of LBP showed significant fluctuations from July to June. The highest percentage of LBP was noticed in September and May at Zewditu Memorial Hospital, Physiotherapy Department that ranged from 40 per cent to 50 per cent. However, the least proportion of LBP was seen from December to April within the Neurology Department where it fluctuated between 20 to 30 per cent. The prevalence of LBP is summarised in the following Table 5.9.

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Table 5.9 The prevalence of low back pain at public hospitals of Addis Ababa

Month	ZMH- Physiotherapy			Neurology[&]			Neurosurgery[&]			TAH- Physiotherapy		
	Total*	LBP	%	Total*	LBP	%	Total*	LBP	%	Total*	LBP	%
July	108	45	41.7	874	186	21.3	495	214	43.2	164	41	25.0
August	112	52	46.4	745	174	23.4	645	178	27.6	153	52	34.0
September	102	55	53.9	907	209	23.0	587	214	36.5	151	42	27.8
October	100	39	39.0	879	263	29.9	617	203	32.9	200	69	34.5
November	121	49	40.5	851	264	31.0	456	92	20.1	149	54	36.2
December	137	63	46.0	724	148	20.4	450	193	42.9	186	58	31.2
January	96	47	49.0	728	177	24.3	545	219	40.2	164	32	19.5
February	119	59	49.6	840	221	26.3	450	173	38.4	179	49	27.4
March	114	50	43.9	685	178	26.0	431	185	42.9	144	34	23.6
April	129	61	47.3	874	264	30.2	486	151	31.1	120	42	35.0
May	109	57	52.3	771	242	31.4	536	205	38.3	178	53	29.8
June	186	86	46.3	710	199	28.1	595	216	36.3	185	56	30.3
Total	1433	663	46.3	9588	2525	26.4	6293	2243	35.6	1973	582	29.5

*Total: the total number of patients seen at each department; LBP: Low Back Pain; TAH: Tikur Anbessa Hospital; ZMH: Zewditu Memorial Hospital; [&]Neurology and Neurosurgery Departments of ZMH and TAH are working together; %: Percentage of Low Back Pain that was computed by (LBP/total) *100.

5.2.3.2 The Burden of Low Back Pain

The burden of LBP measured in this section included data on history of trauma, onset of LBP, duration of LBP, recurrent history of LBP, diagnosis of LBP, associated history of chronic medical illnesses with LBP, and type of chronic medical illnesses. The findings are presented in the following table.

Table 5.10 The burden of low back pain in Addis Ababa public hospitals

The burden of LBP		Frequency	Percent
History of trauma	Yes	76	44.7
	No	94	55.3
Onset of LBP	Sudden	62	36.5
	Gradual	101	59.4
	No response	7	4.1
Duration of LBP	Acute LBP	9	5.3
	Sub-acute LBP	10	5.9
	Chronic LBP	151	88.8
Previous history of LBP	Yes	102	60.0
	No	68	40.0
Diagnosis of LBP	LBP	31	20.5
	Lumbosacral radiculopathy	29	19.2
	CLBP	22	14.6
	Disc Prolapse	33	21.9
	Degenerative lumbar spondylosis	36	23.8
Chronic medical illnesses	Yes	82	48.2
	No	88	51.8
Type of chronic medical illnesses	Hypertension	25	30.5
	Diabetes mellitus	11	13.4
	DM & hypertension	6	7.3
	HIV/AIDS	12	14.6
	Peptic ulcer	9	10.9
	Chronic kidney disease	10	12.1
	Congestive heart failure	5	6.1
	Other*	22	26.9

Other: anaemia, asthma, peripheral neuropathy, ovarian tumour, goitre, epilepsy...*

Of 170 respondents, nearly 45% of individuals had a prior history of trauma to their back, while the remaining 55% had no history of injury or trauma. More than half (59.4%) of individuals indicated that their pain started gradually, while above a one-third (36.5%) thought that the onset of pain was sudden. The remaining 4.1% of individuals did not know how their pain had originated. Almost all of individuals affected by LBP reported that the duration of their pain was more than twelve weeks (chronic LBP), with a mean of 4.84 years (SD=5.02) ranging from a minimum duration of one week and to a maximum of 30 years. However, the remaining 11.2% reported that their pain was either acute or sub-acute.

The survey showed that the majority (60%) of individuals had a previous history of LBP, while the remaining (40%) had no prior history of LBP. Back pain has different diagnosis entities and the commonest diagnoses of LBP collected from the patient medical sheets were lumbosacral radiculopathy, disc prolapse, degenerative lumbar spondylosis and chronic LBP. The proportion of these types of LBP were almost equal (approximately 20% each). In addition to this, there were also different imaging tests that are used to diagnose LBP. Notably, the commonest and most widely used diagnosis modality for LBP in Addis Ababa was Magnetic Resonance Imaging (MRI), which was ordered for 53.9% of back patients. Based on the MRI pertinent results, 37.5% of them were diagnosed as disc prolapse (the commonest site was between L5/S1) and 16.4 per cent of back patients were diagnosed as having a degenerative lumbar spondylosis.

In addition, the variability of diagnosis criterion used by the healthcare professionals, 48% of individuals affected by LBP had at least one type of associated history of chronic medical illness. The most common illnesses were hypertension, HIV/ADIS, diabetes mellitus, and chronic kidney diseases with a proportion of 30.5%, 14.6%, 13.4%, and 12.1%, respectively.

5.2.3.2.1 Traumatic low back pain

Forty-three per cent of individuals aged between 18-24 years had histories of injury than aged between 25-44 years (40%). Similarly, 46% of females had histories of injury than males (43%). The highest proportion of single back patients (46.2%) had history of injury on their back than any other group. Correspondingly, 67% of individuals who had attended primary school had history of LBP, while 54% of individuals who attended secondary school reported that they had histories of trauma to their back. The results from this section illustrate that those individuals who were younger, female, not married, and with low educational attainment were more likely prone to traumatic type of LBP than any other group of the respondents.

5.2.3.2.2 Onset of low back pain

Regarding the onset of LBP and age of respondents, the younger participants aged between 18-24 years (57.1%; n=8) reported that their pain had started suddenly, while 86.7% (n=13) of older individuals described that their pain had developed progressively. This suggests that even though the occurrences of LBP among younger individuals are more associated with

trauma and injury, age-related changes within the lumbar spine have a gradual occurence as age increases. Nevertheless, there is no significant difference between occurrences of LBP and gender of the respondents.

Sudden onset of LBP was higher among single individuals than any other group. Whereas, gradual onset of LBP was reported among divorced and widowed individuals than those who were married. This suggests that single individuals are more prone to risky behaviours than married or divorced individuals. On the contrary, divorced or widowed individuals were found to more susceptible to age-related disorders.

Similarly, sudden onset of LBP was reported by individuals who attained high school and above than any other group (39.4%; n=41), while gradual onset of LBP was described by those individuals who had not attained any education (80%; n=12). The researcher noted that individuals who had better educational attainments reported sudden-onset LBP whereas, individuals who had lower educational attainment tended to be affected by gradually occurring LBP. As noted in section 5.2.2.3.2.1 above, traumatic LBP is occurred mainly on those individuals with lower educational attainment. This is due to the fact that less educated individuals were affected by recurrent LBP and associated medical illnesses than educated individuals.

5.2.3.2.3 Chronicity of low back pain

The highest percentage of acute LBP was reported by younger persons aged between 25-44 years (10%; n=7) than any other group, while older individuals aged above 65 years (93.3%; n=14) and aged between 45-65 years (93%; n=66) reported that their pain was chronic in its nature. From these observations, the researcher understands that as age of an individual increases, the level of chronicity of pain also increases.

Regarding duration of LBP and gender of individuals who had LBP, the highest proportion of chronic LBP was reported by women than men (90.5% versus 87.2%), while highest percentage of acute LBP was reported by men than women (7% versus 3.6%). This implies that female individuals who were affected by LBP had chronic pain than their counterparts. In relation to duration of LBP and marital status, widowed individuals had the highest proportion of chronic LBP than any other group. This is followed by married individuals (91.1%; n=92) who reported that their pain was primarily chronic. Furthermore, individuals

who did not attend any school program had a higher proportion of chronic LBP than those who attained at least primary school. This implies that the utilisation of healthcare services and educational level are directly related.

5.2.3.2.4 Recurrence rate of low back pain

The cross tabulated results between the recurrent history of LBP and the selected demographic profile of back patients indicated that the highest proportion of LBP was reported between the age groups of 25-64 years than the other group. However, the recurrence percentage of LBP between male and female individuals was almost equal (60.5% versus 59.5%). The highest recurrence proportion of LBP was noted among married individuals (62.4%; n=63), which is followed by single individuals (61.5%; n=32). However, individuals who had attained high school and above (62.5%; n=65) had a greater percentage of recurrent LBP than individuals who had attended secondary school (48.6%; n=18). Although individuals who had not attended any type of formal education (73.3%; n=11) had a higher proportion of recurrent LBP than those individuals who had attended primary school only (50%; n=6).

5.2.3.2.5 Associated chronic medical illnesses

The highest proportion of associated chronic medical illnesses with LBP were reported among aged between 45-64 years (64.8%; n=46) than any other group. An almost equal percentage of history of chronic medical illnesses was reported by male and female back patients (47.7% versus 48.8%). Similarly, the proportion of chronic medical illnesses did not show any significant difference between single and married individuals (47.8% versus 48.5%). But a higher percentage of chronic medical illnesses were noticed among widowed (77.8%; n=7) and divorced (75%; n=6) back patients. However, individuals who had not attended any formal education appeared to have developed associated chronic medical illnesses more than any other group (86.7%; n=13) of the respondents.

The chi square test showed that there was a highest correlation between the respondents age and history of chronic medical illness (χ^2= 18.108, P < 0.001) and the respondent's educational level and chronic medical illnesses (χ^2=18.793, P < 0.001). There is also a marginal relationship between duration of LBP and chronic medical illnesses (χ^2= 6.339, P = 0.042) and marital status and history of medical illnesses (χ^2=7.434, P = 0.059).

The association between LBP and chronic medical illnesses has been a common feature in most studies (Benjaminsson et al 2010:641). This study showed that there was a strong association between occurrence of LBP and emerging of chronic medical illnesses. This might be due to the fact that as individuals affected by LBP might have reduced activities, this increased the risk of the development of other chronic medical illnesses. The other concept is that if individual have a prior chronic medical illness, he or she might not be active and his or her muscles and bones become eroded and exposed to back pain. Here, the researcher was explored further the reasons behind this scenario during interviews with healthcare providers. The severity of LBP is discussed in the following sub section.

5.2.3.3 Severity of low back pain

The severity of low back pain measured in this section required that respondents be asked to rate their pain level on the visual analogue scale, which has score range from zero (no pain) to ten (the worst possible pain they had during the course of their pain). In the visual analogue scale (VAS), 39.2% of individuals affected by LBP reported that 'most of the time' their pain was moderate, while 25.6% of individuals indicated that their pain was worst. Just about quarter (25.8%) of back patients indicated that their pain was least. The distribution of the severity of LBP is illustrated in the following diagram.

	0	1	2	3	4	5	6	7	8	9	10
Most pain they felt	2.4	0.6	3.5	5.9	11.8	39.2	6.5	10.6	5.3	3	11.2
Worst pain	1.2	0	1.8	0.6	5.9	18.2	10	13	13.5	10	25.8
Least pain	13.5	3.5	20	13.6	15.3	25.8	2.4	2.4	0.6	0	2.9
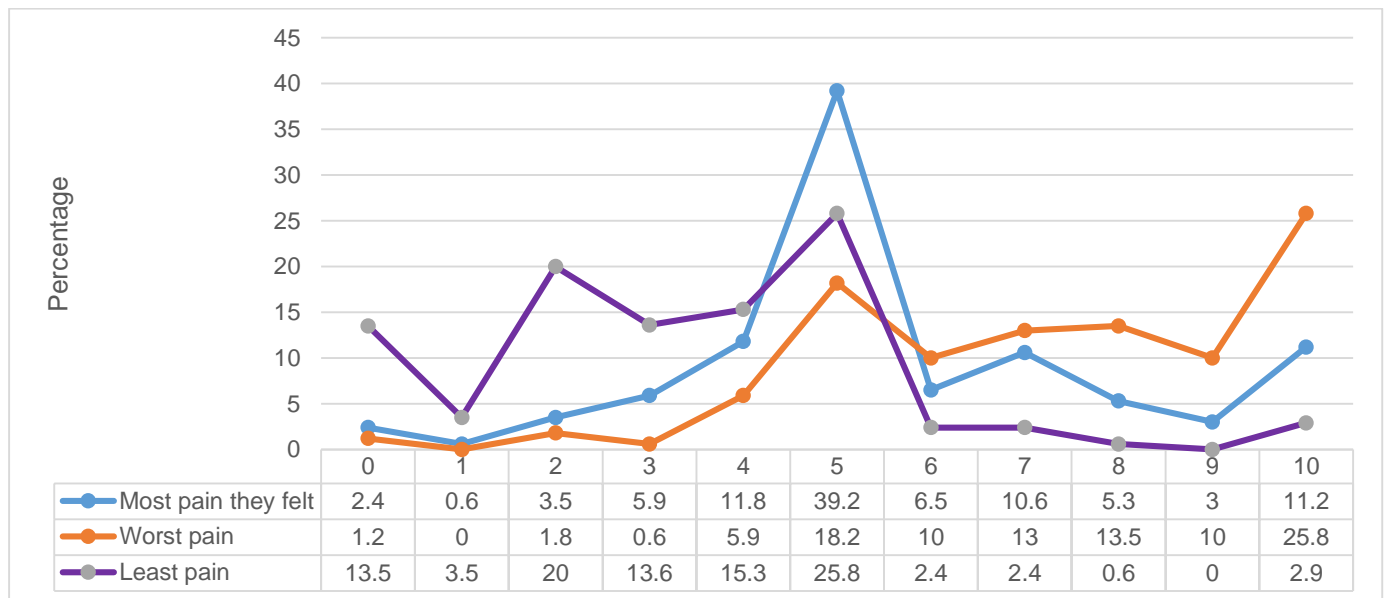
Figure 5.8 Severity of LBP on the visual analogue scale

The average scores for most of the time, worst pain and least pain were 5.63 ± 2.287, 7.28 ± 2.3, and 3.39 ± 2.192, respectively. Overall, the severity of LBP in Addis Ababa ranged from 3-7. Severity of pain was determined by gender of the respondents (χ^2= 5.089, P = 0.024). However, there were no statistical differences between severity of pain scores and variables of age, marital status and educational level (P > 0.05).

According to Table 5.11 below, respondents aged between 18-24 years (57.1%) had felt mostly moderate pain than any other group. Similarly, 85.7% of younger respondents indicated the worst possible pain they felt was severe pain, while 60% of older individuals aged above 65 years noted that their pain was the lowest recordable severity.

With respect to gender and severity of LBP, 69% of female individuals indicated that their pain was the worst ever and 50% of male individuals indicated that their pain was mostly moderate and nearly 56% reported that their pain was the lowest recordable severity. In the main, divorced and married individuals reported that their pain was moderate while, a third (75%) of single individuals indicated that the worst pain they felt was sever pain. On the other hand, the least pain was reported by married individuals (61.4%) than any other group. Individuals who had attended high school and above mostly they pain they felt was moderate, while individuals with low educational attainment the worst pain they felt was severe (70.3%) and the least pain they noticed was mild (73.3%).

Table 5.11 The severity of LBP by age, gender, marital status and educational level

Selected demographic profile of back patients		Most Pain			Worst Pain			Least Pain		
		Mild	Moderate	Severe	Mild	Moderate	Severe	Mild	Moderate	Severe
Age	18-24	14.3	57.1	28.6	14.3	0.0	85.7	42.9	28.6	7.1
	25-44	18.6	44.3	35.7	8.6	25.7	65.7	54.3	31.4	10.0
	45-64	25.4	46.5	23.9	8.5	33.8	54.9	50.7	25.4	2.8
	65+	26.7	40.0	33.3	6.7	33.3	60.0	60.0	26.7	0.0
Gender	Male	26.7	50.0	20.9	8.1	36.0	55.8	55.8	24.4	4.7
	Female	16.7	41.7	39.3	9.5	19.0	69.0	48.8	32.1	7.1
Marital status	Single	21.2	46.2	32.7	5.8	19.2	75.0	42.3	32.7	7.7
	Married	22.8	48.5	28.7	10.9	31.7	56.4	61.4	24.8	5.0
	Divorced	0.0	50.0	50.0	0.0	12.5	87.5	25.0	37.5	12.5
	Widowed	33.3	11.1	44.4	11.1	44.4	33.3	33.3	33.3	0.0
Educational level	No school	46.7	33.3	20.0	16.7	41.7	41.7	73.3	6.7	0.0
	Primary school	41.7	25.0	33.3	10.8	18.9	70.3	66.7	25.0	0.0
	Secondary school	13.5	45.9	37.8	6.7	26.9	64.4	45.9	21.6	16.2
	High school & above	18.3	50.0	28.8	6.7	40.0	53.3	49.0	34.6	3.8

5.2.3.4 The impacts of low back pain

In this section, individuals affected by LBP were asked to give their responses on the activity restrictions, changed working setting, taking rest, healthcare utilisation, and general health status. Table 5.12 below shows that 74.7% (n=127) of individuals had activity restrictions and 24.1% (n=41) were changed their working settings due to LBP. Similarly, 62.4% (n=106) of individuals affected by LBP were forced to take rest. Whereas, 79.4% (n=135) of individuals affected by LBP had visited healthcare facilities more than once and nearly half (26% fair and 23% poor) of individuals' health status was relatively poor. The impacts of LBP are presented in the following table.

Table 5.12 The impacts of low back pain an Addis Ababa public hospitals

Impacts of LBP		Frequency	Percent
Restricted activities	Yes	127	74.4
	No	43	26.2
Changed working setting	Yes	41	24.1
	No	109	64.1
	No response	20	11.8
Taking rest	Yes	106	62.4
	No	64	37.6
Healthcare utilisation	Yes	135	79.4
	No	35	20.6
General health status	Excellent	14	8.2
	Very good	25	14.7
	Good	48	28.2
	Fair	44	25.9
	Poor	39	22.9

The cross tabulated results between selected demographic profile of individuals and the impacts of LBP indicated that older people, aged above 45 years, had a higher percentage of activity restrictions than any other group. Similarly, nearly one-third (31.0%) of individuals aged between 45-64 years had changed their work setting, and three-quarters (71.8%) were forced to take rest and 87.3% of them were visited healthcare facilities for more than once than any other group of the respondents. The impacts of LBP by age, gender, marital status and educational level are shown in table 5.13 below.

Based on the table below, LBP has more significant consequences on women than men. This is reinforced by 81% of female back patients who reported that they had activity restrictions compared to men (68.6%). Similarly, 34.5% had changed their working department, although 65.5% were forced to take rest and 84.5% attended follow up clinics more than once. Similarly, married and divorced individuals had activity constraints than any other group of the respondents (78.2% and 77.8% respectively). Likewise, divorced

individuals (37.5%) changed their working setting more often than any other group. By contrast widowed individuals (77.8%) were forced to take rest, while divorced patients (87.5%) visited healthcare facilities more than any other group.

Table 5.13 The impacts of LBP by age, gender, marital status and educational level

Selected demographic profile of back patients		Activity restrictions		Changed working setting		Taking rest		Healthcare utilisation	
		Yes	No	Yes	No	Yes	No	Yes	No
Age	18-24	57.1	42.9	28.6	57.1	57.1	42.9	57.1	42.9
	25-44	68.6	28.6	17.1	75.7	52.9	47.1	77.1	22.9
	45-64	81.7	18.3	31.0	56.3	71.8	28.2	87.3	12.7
	65$^+$	86.7	13.3	20.0	53.3	66.7	33.3	73.3	26.7
Gender	Male	68.6	30.2	14.0	69.8	59.3	40.7	74.4	25.6
	Female	81.0	17.9	34.5	58.3	65.5	34.5	84.5	15.5
Marital status	Single	73.1	26.9	30.8	55.8	65.4	34.6	80.8	19.2
	Married	78.2	21.8	20.8	69.3	58.4	41.6	79.2	20.8
	Divorced	35.5	50.0	37.5	37.5	75.0	25.0	87.5	12.5
	Widowed	77.8	22.2	11.1	77.8	77.8	22.2	66.7	33.3
Educational level	No school	93.3	0.0	33.3	46.7	86.7	13.3	100.0	0.0
	Primary school	83.3	16.7	33.3	58.3	58.3	41.7	91.7	8.3
	Secondary school	83.8	16.2	35.1	48.6	81.1	18.9	89.2	10.8
	High school & above	67.3	31.7	18.3	72.1	53.8	46.2	72.1	27.9

Regarding educational status and impacts of LBP, the highest proportion of individuals with low educational attainment had activity restrictions (93.3%), and were forced to take rest (86.7%) and almost all (100%) of them visited the outpatient departments more than once:- rates that were higher than any other respondent who had attended secondary school and above. However, the highest percentage of back patients who had attended secondary school (35.1%) changed their work setting than any other group.

There was correlation between marital status of the respondents and activity limitations (χ^2 = 18.014, P = 0.029), educational level of the respondents and activity limitations (χ^2= 13.659, P = 0.034). Moreover, there was a high statistical significance between gender and changed work setting (χ^2= 11.337, P = 0.003), educational level of the respondents taking rest due to LBP (χ^2 = 12.657, P = 0.005) and educational level of the respondents with healthcare utilisation (χ^2 = 10.664, P = 0.014).

5.2.4 Assessing the constructs of health belief model

In reference to the theoretical framework of the study, the six constructs of health belief model formed the basis for the development of the questionnaire. The purpose of this section of the questionnaire was used to measure understanding of individuals to their susceptibility to LBP, severity of LBP, the benefits of preventing back pain, the barriers to prevent occurrences of LBP, cues to take an action and to know their self-efficacy level. In the following six sub-sections, individuals affected by LBP were asked for responses that indicated their opinion by either agreeing or disagreeing with the posed statement. Based on their understanding of the statement, they were asked to rate their responses according to the Likert scale which ranged from strongly disagree, disagree, neutral, agree and strongly agree.

5.2.4.1 Perceived susceptibility

Figure 5.9 Constructs of HBM 1: perceived susceptibility

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This construct of HBM included five questions that focused on the perceived susceptibility of respondents to LBP, which are indicated in Figure 5.9 above. The statements that were asked in this section were: has my poor physical health increased my risk of developing back pain, the presence of a possibility for developing back pain, I worried a lot before I developed back pain, chances of getting recurrent back pain and beliefs about the contribution that movements performed had on the aggravation of back pain. From the five statements, related to perceived susceptibility constructs, nineteen per cent (19%) of respondents strongly agreed that their chance of getting recurrent LBP was high. Forty-three per cent (43.2%) of back patients agreed that there was a good possibility to develop LBP; forty per cent (39.6%) agreed that the chance of getting recurrent LBP was high and thirty-five per cent (34.8%) of the respondents agreed that their poor physical health contributed to their susceptibility of LBP. There was no statistical significance between the perceived susceptibility construct variables and the selected demographic profile of back patients (P > 0.05). Even though the researcher could not find any statistically significant results from this section, there was acceptance that health jeopardising behaviours were linked with the susceptibility of LBP. Thus, the researcher explored these behaviours from back patients with open-ended questions.

5.2.4.2 Perceived severity

In this section respondents were asked to rate (scale of 5: strongly agree, agree, neutral, disagree and strongly disagree) their perception of severity levels with respect to the assessment of feelings about self, LBP as an incurable disease, LBP as caused by different problems, endangered financial security, awareness/ information about LBP and fears related to LBP.
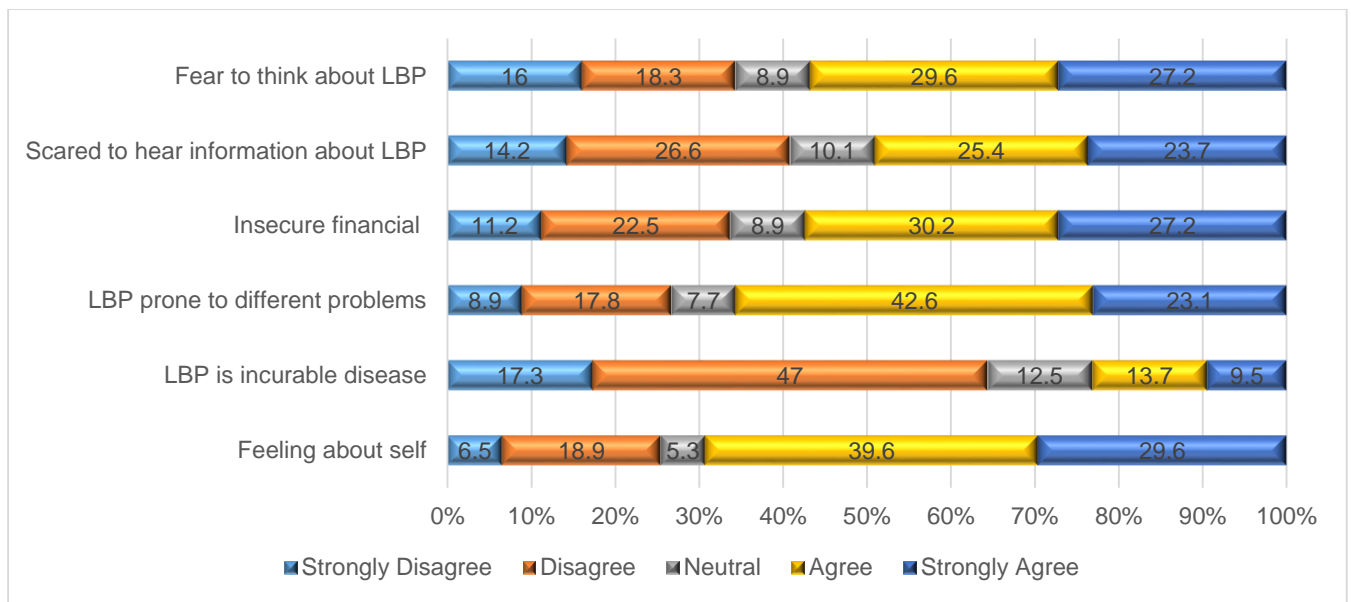
Figure 5.10 Constructs of HBM 2: perceived severity

In Figure 5.10 above, respondents reported that after they developed LBP, their feelings about themselves had changed (39.6%) and forty-three per cent (42.6%) of the individuals affected by LBP were agreed that LBP had prone them to different problems. Whereas, forty-seven per cent of individuals affected by LBP were disagreed that LBP is an incurable disease. Twenty-seven per cent of individuals strongly agreed that their financial security was endangered and above one-fourth of the individuals affected by LBP were agreed that they developed fear to think about their pain (29.6%) and they scared to hear information about LBP (25.4%).

The three relational variables that were statistically significant were respondents' age and feeling about self (χ^2 = 22.005, P = 0.037); respondents age and LBP prone me to difference problems (χ^2 = 24.841, P = 0.016); respondents age and financial insecurity (χ^2 = 23.841, P = 0.021); marital status and financial insecurity (χ^2 = 26.283, P = 0.010). The remaining seven variables were not statistically significant with the selected demographic profiles of back patients (P > 0.05).

When a patient experiences pain and activity restrictions, they expected that their feelings towards themselves would change. This negative perception towards their body further worsens the condition and increases vulnerability to different problems. This statement was also further explored via the open-ended questions in order to gain additional insights into

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how LBP increased respondents' vulnerabilities to different problems; their overall feelings towards themselves and their financial security.

5.2.4.3 Perceived benefits

The perceived benefits associated with the prevention of LBP were articulated by way of opinions related to six statements. The question items were eating traditional diets, avoiding alcohol, avoiding smoking cigarettes, following medical treatments, taking painkillers and doing physical exercise. Figure 5.11 below presents the benefits of understanding the prevention mechanisms of LBP as articulated using the HBM constructs.
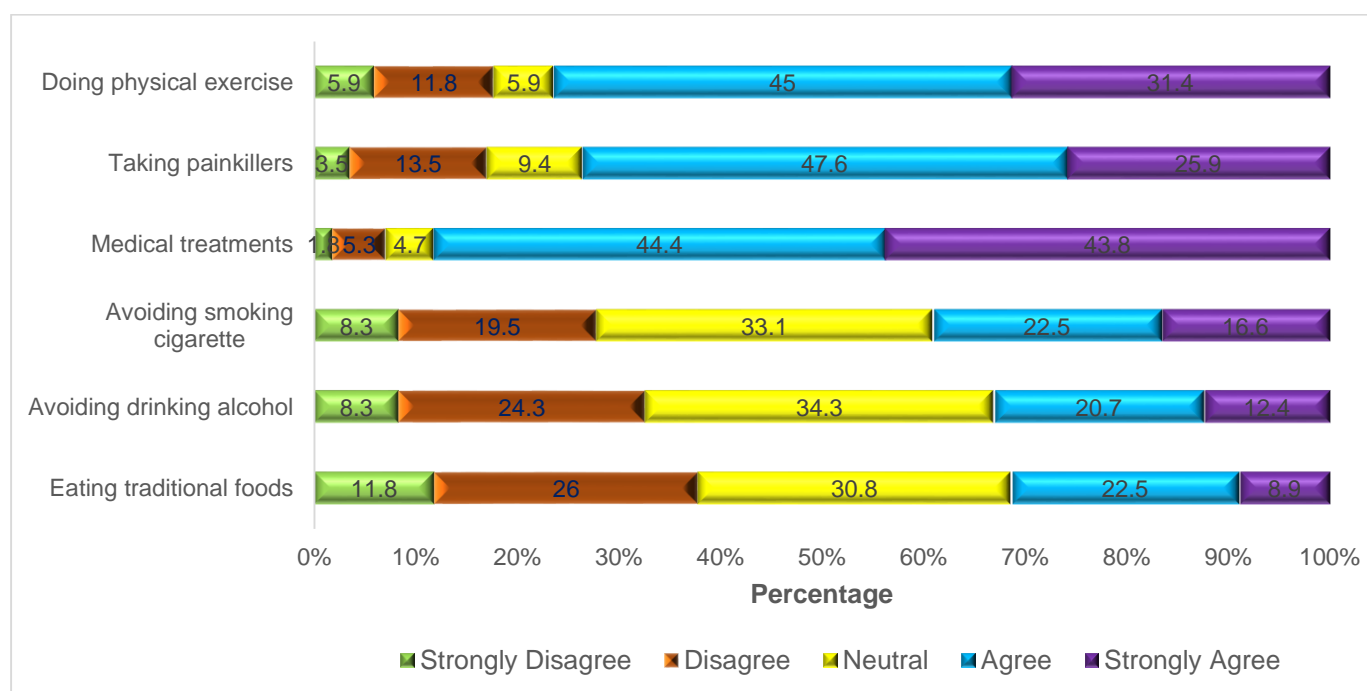
Figure 5.11 Constructs of HBM 3: perceived benefits

More than one-third of individuals affected by LBP indicated that they did not agree or disagree with the statement that avoiding drinking alcohol (30.8%), avoiding smoking cigarettes (33.1%), and eating tradition foods (30.8%) could prevent occurrences of LBP. However, twenty-six per cent (26%) of individuals disagreed that eating traditional foods could prevent occurrence of LBP even though twenty-two per cent (22.5%) were agreed that it can prevent occurrences of LBP. On the other hand, basing the medical treatments is effective in reducing symptoms from the effects of LBP, taking painkillers are

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effective in preventing illness from LBP and doing physical exercise prevents future complications of LBP were all rated between 45%-50% in agreement with the statements.

The findings did not indicate strong statistical correlations between eating traditional foods, avoiding drinking alcohol and cigarette smoking, and doing physical exercises with the selected demographic profiles (P > 0.05). However, medical treatment and taking painkillers showed strong association with gender (χ^2 = 13.110, P = 0.011; and χ^2 = 16.733, P = 0.002, respectively).

5.2.4.4 Perceived barriers
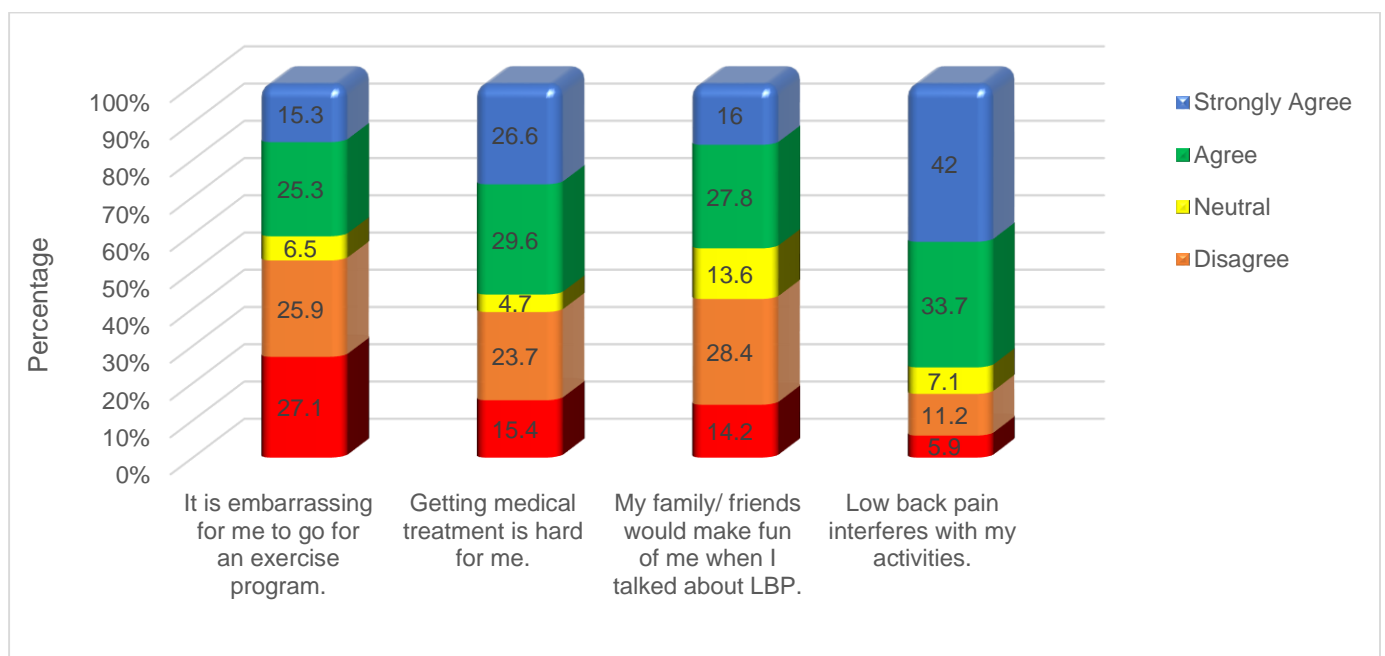
Figure 5.12 Constructs of HBM 4: Perceived Barriers

As an individual understands the benefits of prevention of LBP, there are barriers that hinders that may act to limit progression of LBP. They should know these barriers to tackle and prevent further complications of LBP. Nearly one-fourth (25.3%) of the respondents in this study agreed that they had difficulties going out for exercise and almost one-third (29.6%) of individuals affected by LBP agreed that they had financial problems which negatively affected their ability to get medical treatment and similarly, they reported low social support. Forty-two per cent (42%) of the respondents strongly agreed that LBP had interfered with their daily activities. Figure 5.12 above presented the responses from survey participants.

The variable relating to physical exercise did not show any statistical significance in cross tabulation for all the selected demographic profile of back patients (p>0.05). However, there was strong statistical significance between gender and getting medical treatments (χ^2 = 10.890, P = 0.028); marital status and family support (χ^2 = 25.021, P = 0.015); age and LBP interfere with daily activities (χ^2 = 22.949, P = 0.028); and gender and interference of LBP on daily life (χ^2 = 11.233, P = 0.024).

Jawson and Virts (1990:283) stated that the patients who reported lack of family support tended to have severe pain and relied much more heavily on medical treatment. These patients also showed more emotional distress that interfere with their daily life compared with patients getting family support. Additionally, patients having good family support reported lower pain intensity, and were less dependent on medications and had better functional levels. Therefore, family support was important to back patients in order to promote the interest in getting medical treatments and to reduce the interference of pain on their daily life and activity. On the contrary, a study by Strunin and Boden (2004) revealed that individuals affected by LBP had a wide range of restrictions on family and social responsibilities, such as their ability to do domestic chores, to take part in caring for children, and to involve themselves in holiday activities. The findings from the study were not always in agreement with published summarisations and as such, more attention was taken by the researcher to better understand the reasons and barriers that limited participant involvement in health promoting behaviours to prevent the occurrences of LBP. This variable was explored in detail by using interviews with the back patients and healthcare providers.

5.2.4.5 Cues to take action

The respondents understand that preventing occurrences of LBP is crucial. Approximately forty per cent (27.2% disagreed and 13% strongly disagreed) of back patients did not eat a well-balanced diet, while the majority of them (33.7% disagreed and 27.8% strongly disagreed) indicated that they were not taking vitamins and minerals when they did not eat a good meal. Similarly, 36% of the respondents (18.3% disagreed and 17.8% strongly disagreed) had not tried to keep their ideal body weight. Nearly one-fifth (18.9%) of them did not try to avoid getting tense and anxious, and one out of eleven individuals admitted to not seeking out information about his/her health. About thirty-six per cent (28.4% disagreed & 7.1% strongly disagreed) of respondents disagreed with the statement that they were not

sitting in an upright posture in order to reduce the occurrence of LBP. Almost all individuals (57.4% agreed and 34.9% strongly agreed) admitted to following health instructions and medical orders prescribed to them by the healthcare providers. The "cues to take action" construct responses were presents in the following diagram.

	Eat balanced diet	Take vitamines	Keep ideal weight	Follow medical orders	Avoide stress	Search information	Sit in upright posture
Strongly Agree	10.7	4.7	13	34.9	18.3	33.7	18.9
Agree	35.5	14.8	37.9	57.4	47.9	47.3	33.7
Neutral	13.6	18.9	13	4.1	14.8	7.7	11.8
Disagree	27.2	33.7	18.3	2.4	13	8.9	28.4
Strongly Disagree	13	27.8	17.8	1.2	5.9	2.4	7.1
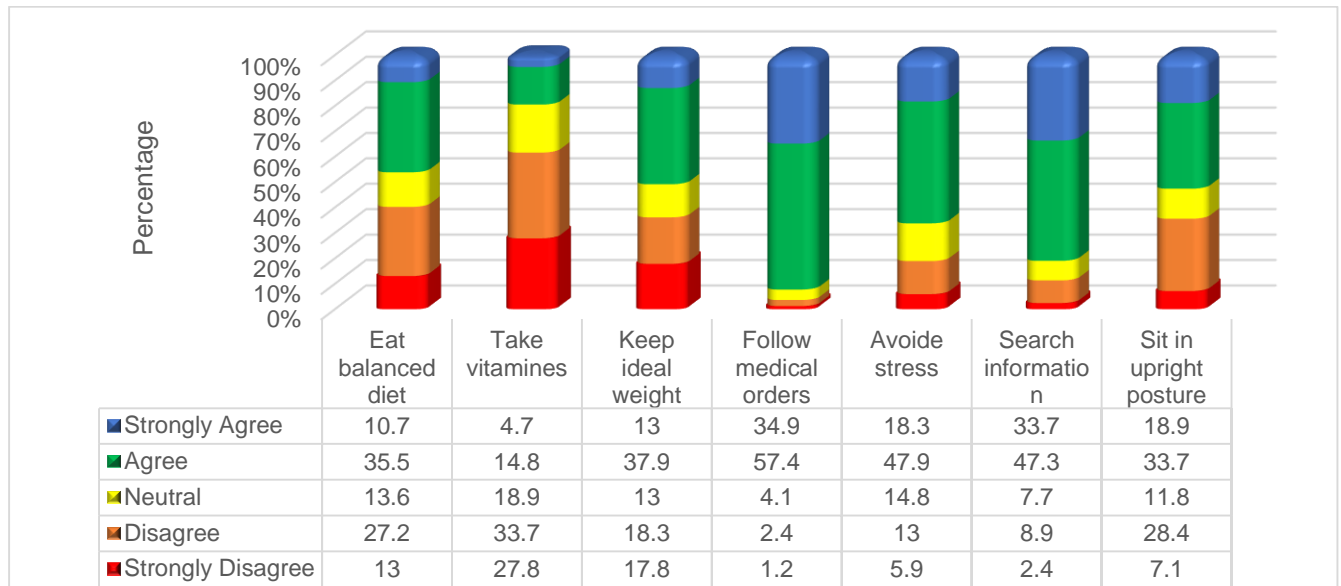
Figure 5.13 Constructs of HBM 5: Cues to take action

The statistical significance in all the variables measured in this section of the study suggests that there was association between the educational level of the respondents with cues to take action in order to prevent the occurrence of LBP. There was strong association between educational level of the respondents' and eating a well-balanced diet (χ^2= 24.653, P = 0.017); educational level and searching for new information (χ^2= 30.871, P = 0.002), while there was a borderline correlation between gender of the respondents' and searching for new information (χ^2= 9.690, P = 0.046). However, taking vitamins and minerals, keeping ideal body weight, following medical orders and avoiding getting tense and anxious did not showed any statistical significance with the independent variables: age, gender, marital status and educational level (P > 0.05).

Poor eating behaviour was one of the contributing factors for the development of LBP. Meleger, Froude and Walker (2014) found an association between poor eating behaviour and deficient nutrient consumption with chronic pain. Persons who take calories within the recommended daily allowance level are able to prevent deficiencies of vitamins and

minerals. In this study, educated individuals have a better understanding to the benefits of eating well-balanced diet and searching new information about their overall health status. This might have enabled them to gain knowledge on the benefit of sitting in upright posture and some other related preventive measures. Here, the researcher wants to understand the reasons behind these variables and explored these further in the qualitative phase of the study.

5.2.4.6 Self-efficacy
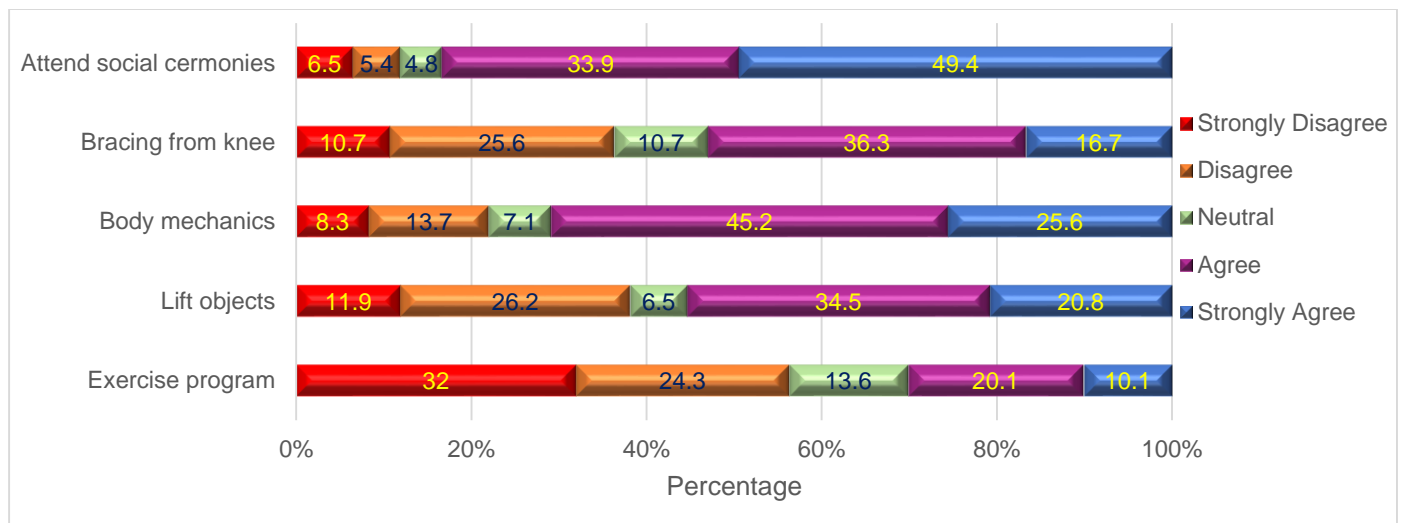
Figure 5.14 Constructs of HBM 6: self-efficacy

In this section, back patients were asked questions about their rating on an exercise programme, their feelings on their back if they lift objects with great precautions, their knowledge on lifting objects properly by using body mechanics, their rates on lifting objects by bracing from knees and their ability to attend religious and social ceremonies. Their responses are presented in figure 5.14 above. There was a strong disagreement (32%) and disagreement (24.3%) with the commitment of doing exercises three times a week. Nearly 34-45% of the respondents agreed that they felt better on their back if they lift objects with a great precaution, they knew how to lift objects properly by using body mechanics, they lift objects by bracing from their knees and abled to attend religious and social ceremonies. But half (49.4%) of the respondents were strongly agreed that they were able to attend any type of religious or social gatherings.

The chi square results indicated that engaging in some form of exercise programme for three times a week, lifting objects by bracing from knees and attending social ceremonies was not statistically significant for both the respondents' age, gender, marital status and educational level (P > 0.05). While, there was a borderline correlation between age and lifting objects with precautions (χ^2 = 21.422, P = 0.045).

Snook (2005:1339) reported that knowledge on back ergonomics is essential to prevent the development of LBP. These include lifting objects with great precaution, lifting by bracing from knees and sitting in upright posture. Individuals who tried to maintain their normal anatomical posture might reduce their exposure to back pain. This concept was explored further to develop deeper insights on the knowledge of back ergonomics by back patients and healthcare providers. Next, the key findings from the survey on the bio-medical and culture based modifiable factors is presented in-detail.

5.2.5 The key bio-medical and cultural factors

The risk factors of LBP were grouped into bio-medical and culture-based risk factors based on the evidence obtained during the literature searching process. The bio-medical factors identified during the survey inquiry were age, sex, educational level, marital status, number of children, occupation, weight, smoking cigarette, drinking alcohol, fall down accident, dealing with stress of daily life, chronic medical illnesses, poor physical health, recurrent LBP and knowledge on back ergonomics. These factors were further classified into modifiable and non-modifiable risk factors. The modifiable factors included weight, smoking cigarette, drinking alcohol, accident, dealing with stress of daily life, chronic medical illnesses, poor health status and knowledge on back ergonomics. Searching information for LBP is included under knowledge on back ergonomics in order to minimise a possible over appraisal of the determinants. Whereas, age, sex, educational level, marital status, number of children and occupation were designated as non-modifiable risk factors for LBP.

The cultural factors that were identified from the survey findings included religion, ethnicity, sedentary lifestyle, eating habit, physical inactivity, type of bed, type of mattress, transportation mode, overcrowding, utilising technology, life expectations, time for relaxation, family or friend support, familial fighting, following medical orders and attending social gatherings. Here, religion and ethnicity are non-modifiable risk factors for LBP, whereas, the

remaining factors were considered to be modifiable factors for LBP. The bio-medical and cultural factors for LBP are summarised in the following diagram.

Bio-Medical Factors	Modifiable Factors	Cultural Factors
Age	Chronic Medical Illnesses	Religion
Sex	Sedentary Lifestyle	Ethnicity
Educational Level	Eating Habit	Sedentary Lifestyle
Marital Status	Physical Activity	Eating Habit
Number of Children	Weight	Physical Activity
Occupation	Drinking Alcohol	Type of Mattress
Weight	Smoking Cigarette	Transportation Mode
Smoking cigarette	Type of Mattress	Overcrowding
Drinking Alcohol	Transportation Mode	Utilising Technology
Chronic Medical Illnesses	Overcrowding	Life Expectations
Poor Health Status	Life Expectations	Time for Relaxation
Recurrent LBP	Relaxation Time	Family Support
Fall Down Accident	Family Support	Familial Fighting
Stress and Depression	Domestic Violence	Attending Social Gathering
Knowledge on Ergonomics	Attending Social Gathering	
	Fall Down Accident	
	Stress and Depression	
	Knowledge on Ergonomics	

Figure 5.15 The key bio-medical and culture-based risk factors for low back pain

Based on the quantitative findings of the study, the researcher further explored, in detail the modifiable risk factors of LBP and the influence of cultural beliefs on the development of LBP through interviews with the back patients and key informant interviews with the HCPs in order to develop a culturally sensitive integrated preventative model for the prevention of LBP among healthier individuals.

5.3 SUMMARY

Findings from this study revealed that the development of low back pain was complex. The risk factors originated from personal, social, cultural, environmental and economic precipitating influences. Based on the survey findings, there are bio-medical, and culture-based modifiable risk factors of LBP that required further explanation and they formed the foundation of discussion for the qualitative phase of the study. These factors include body weight, smoking cigarette, drinking alcohol, eating habit, physical inactivity, transportation method, sleeping material, job dissatisfaction, prolonged sitting, movement patterns, workload, unsuitable working environment, time for relaxation, participating in social programmes, sedentary lifestyle, overcrowding, life expectations and familial fighting. Furthermore, accidents, poor physical health, feelings about self, family support, existence of knowledge about LBP and back ergonomics were also explored from the constructs of the health belief model. In addition to these modifiable risk factors of LBP, the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours is also explored in detail in order to get in-depth insights on the cultural and social factors in the vulnerability to LBP.

CHAPTER 6

DATA PRESENTATION AND ANAYLSIS: THE QUALITATIVE PHASE

6.1 INTRODUCTION

The previous chapter presented the findings of the quantitative phase of the study. Based on the sequential explanatory mixed method design, the collection and analysis of the data of this phase could be conducted following the data analysis of the quantitative phase. Therefore, this chapter intended to present the qualitative phase of the study. In this study, the collection and analysis of the data occurred simultaneously. The data collection tools were in-depth interviews with back patients' and key informant interviews with the healthcare providers. The researcher collected data by asking them specific open-ended questions about the modifiable risk factors of LBP. A semi-structured interview schedule was used to collect the textual data (See Annexe N and Annexe Q).

The data collected through these two instruments was analysed deductively using thematic analysis. This approach is preferred in qualitative research as it allows the data to express itself through the emergence of themes and subthemes. During this process, the researcher followed the general thematic analysis anticipated to answer the research questions; to explore and describe the key modifiable risk factors of LBP. Thematic findings were interpreted in line with the research objectives and interviewees' lived experiences and informants' expertise knowledge. Additionally, this phase also explored the influence of cultural belies on the development of health promoting and health jeopardising behaviours in the development of LBP based on the two participant sources in the public hospital setting. Finally, the researcher interconnected the themes to design the integrated preventative model.

6.1.1 Structure of the chapter

The most common source of qualitative data within phenomenology is the interview (Yin 2011). So, in order to explore the modifiable risk factors from the participants, the researcher combined in-depth and key informant interviews. The aim of this chapter is to answer objectives 4 and 5 of this study (to explore culture based and bio-medical modifiable risk factors of LBP and to explore how the cultural beliefs influence the development of health promoting and health jeopardising behaviours in the development of LBP). For this reason,

the researcher prepared the whole process of the qualitative phase of the study in three steps. The steps are concisely outlined as follows.

Step one: The researcher presented the qualitative data through transcribing the recorded audios by listening repeatedly. He further reads the corpus and jots down notes in memos for each transcript. This enables the researcher to familiarise himself with the data.

Step two: He analysed the qualitative data by developing a thematic map. After coding, he analysed the data through this map. He started the data analysis through predetermined initial codes and by modifying and generating new codes, in such a way as to ascertain pertinent patterns. This was done by organising similar codes relevant to each other from various participants. Codes were searched and combined to form higher themes. Then, He revised the themes contain the entire data set.

Step three: Finally, he interpreted the data by extracting general themes and subthemes. Then the final research report was produced from the analysed data. In this phase, the researcher has responsibilities as interviewer to administer the interview schedule and data manager to analyse and give meanings to the collected data. Therefore, this section is presented based on the following diagrammatic scheme.

Data Presentation	Data Analysis	Interpretation
• Transcribing the data • Reading and re-reding the data • Noting down initial ideas	• Coding interesting features of the data • Generating thematic map • Ongoing data analysis	• Final analysis • Producing the report
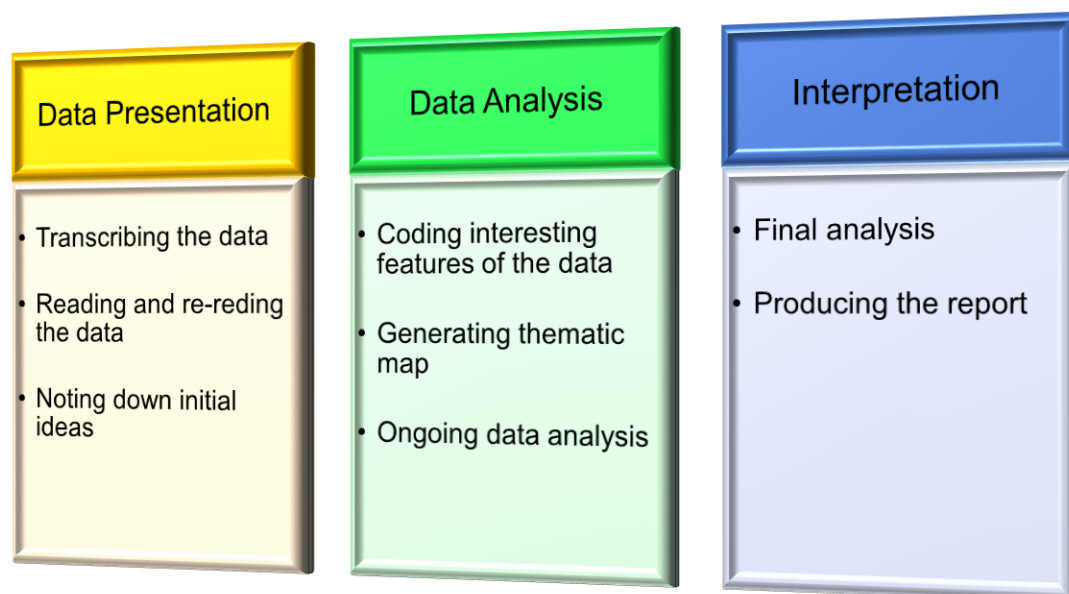
Figure 6.1 Steps of the qualitative data presentation, analysis and report

(Source: Eliana 2014 and Maguire & Delahut 2017:3354)

6.1.2 Rationale for the separate data presentation format

The quantitative and qualitative data analysis occurred in a sequential order. Because the study design is sequential explanatory mixed method, it involves the presentation of quantitative data first and informs the subsequent qualitative data presentation (Onwuegbuzie & Combs 2011:4). The data presentation for the two phases do not interact with one another until it reaches the integration phase of the study (Chapter seven). The presentation of the data into different chapters indicates the phases of the study. The previous chapter presented the quantitative phase of the study, where the timelines between data collection and analysis is different. However, in this chapter, the data collection and analysis occurred simultaneously.

Liamputtong (2011) described that reporting qualitative data should prioritise subjective over objective data and it must be reported in first person language. This is what makes it different from the presentation of a quantitative study. Guided by this, the presentation of the quantitative and qualitative phases of the study in separate chapters enabled the researcher to present the data sets in a sequential order. Such types of data presentation have the likely challenge of a lack of integration of the research methods and in turn, reduced validity of the research findings. So, to avoid this risk, the researcher integrated the findings of the quantitative and qualitative phases of the study in the following chapter. Therefore, a separate presentation of the phases of the study enables a valid explanation for the research questions. However, Curry, Nembhard and Bradley (2009:1449) stated that if the researcher clearly presented the rationale of utilising a sequential study design in the methodology chapter, a separate report of the two phases of the study is acceptable.

The qualitative data was presented and analysed differently from the first phase of the study. Sequential mixed method design is advised in the study where there is an involvement of different study participants partaken in a single study with a diverse area of knowledge. Thus, this study included the back patients and healthcare providers with a heterogeneous socio-demographic and educational backgrounds. At this point, a separate presentation of the two phases of the study were used to triangulate the findings and helped the researcher to improve the scientific rigour of the study (Liamputtong, 2011:317). The next section presents the findings of the second phase of the study.

6.2 PHASE 2: THE QUALITATIVE DATA PRESENTATION

For the purpose of a comprehensive presentation of this chapter, the researcher followed the pertinent findings from the first phase of the study. Based on the results from the survey, the researcher developed a 'thematic map' to apply to the qualitative data presentation, the steps are provided in section 6.1.1 above. He selectively coded the data, systematically relating codes into themes and validating and revising the themes or subthemes which need further modifications. The thematic map used for the presentation and analysis of the data for this phase is presented in figure 6.2 below.
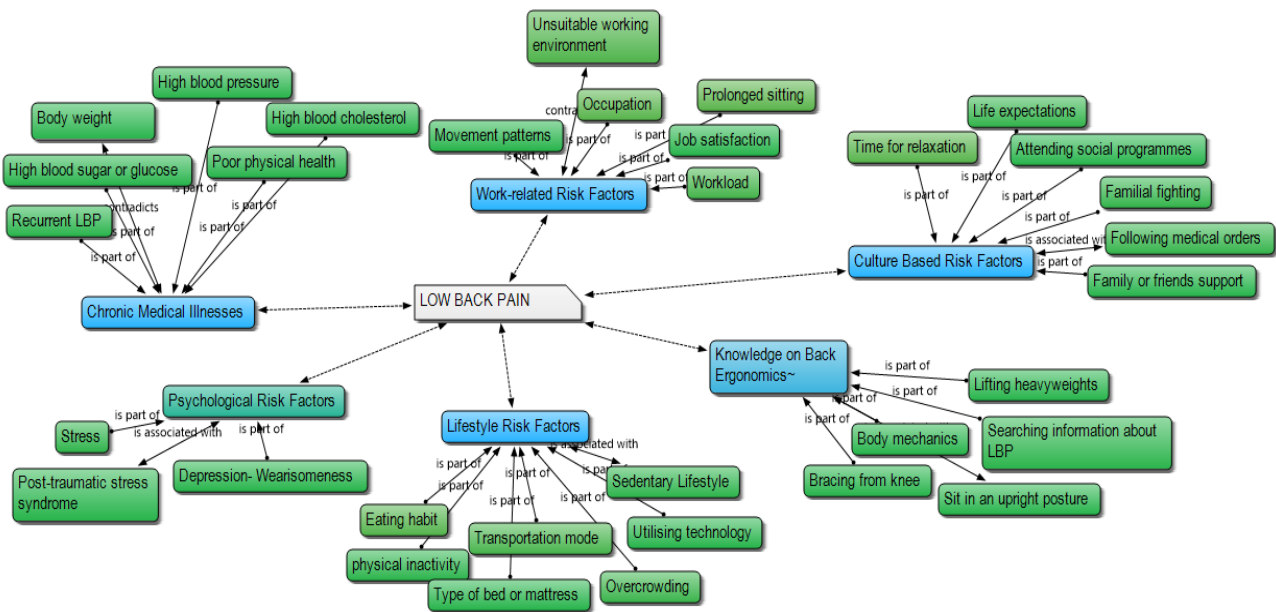
Figure 6.2. Thematic map: used for the qualitative data presentation and analysis

Based on the above figure 6.2, the thematic map had six themes and close to 33 subthemes. The themes used for this phase are chronic medical illness, lifestyle factors, work-related factors, psychosocial factors, socio-cultural factors and knowledge on back ergonomics. Each theme was also further divided into subthemes accordingly. The interview segments that are quoted in this report were only slightly cleaned up and edited. Both the lived-experiences and expert knowledge were captured to justify issues commonly raised by the participants. The findings of the study were presented separately for the in-depth interview of back patients and key informant interviews with the healthcare providers in detail as below.

6.2.1 Data presentation of interviews

The purpose of the in-depth interview as stated in chapter four of the study was to explore the modifiable risk factors of LBP and the influence that cultural beliefs have on the development of health promoting and health jeopardising behaviours for the development of LBP among individuals in Addis Ababa. In this section, the researcher presented the collected data from the interviews of the back patients and healthcare providers. Interviews with the back patients included eighteen (18) and eight (8) healthcare providers (HCPs). The summary of the participants for both the in-depth and key informant interviews is presented as below.
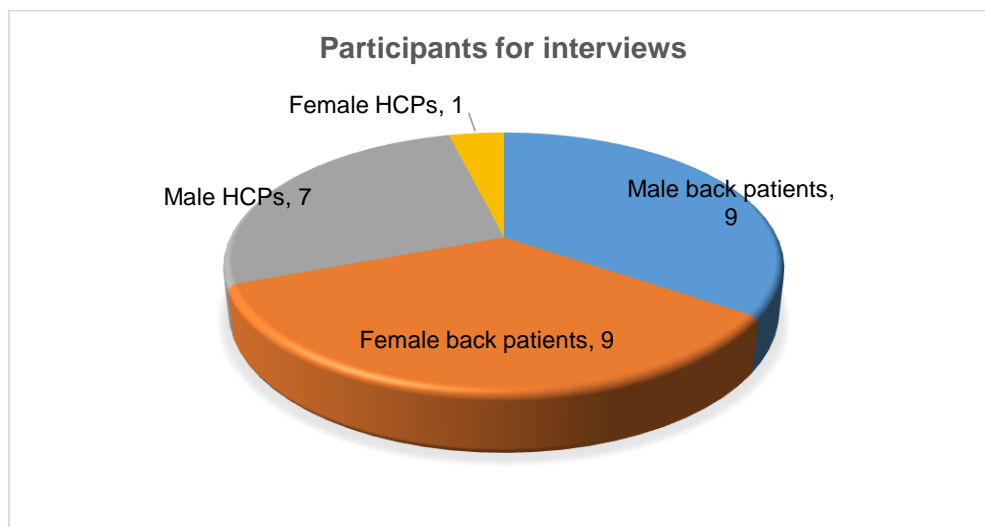
Figure 6.3 Summary of the participants

The study was intended to explore the lived-experience of the back patients, and expert knowledge of healthcare providers who have had strong clinical experiences with LBP care. At the start of the data collection, the researcher used predetermined thematic areas that help to give a comprehensive and detailed explanations and insights about the modifiable risk factors of LBP and the influence of cultural beliefs on the development of LBP. Furthermore, he was also eager to include any new emerging ideas and themes that occurred in the data (Creswell & Clark 2015:359). Findings of the in-depth interviews with the back patients is presented first and is followed by the key informant interviews as follows.

6.2.1.1 In-depth interview data presentation

The researcher went to the medical director of the hospital and presented a support letter that was written by the Addis Ababa Regional Health Bureau. After a brief discussion on the purpose and objectives of the study, the director communicated to the head of each department included in the study to allow the study to take place. The researcher then returned to the department to conduct in-depth interview of forty-five up to sixty minutes each, with the back patients. First, he probed the back patients for the findings of previous survey study's and explained the research purpose and objectives. He then asked them for their consent to take part with the in-depth interviews concerning their lived experiences about LBP. Luckily, all the selected back patients agreed to participate in the interview.

A semi-structured questionnaire was used as an interview guide. The schedule for the interview was planned based on the thematic areas identified from the survey results. This enabled him to explore and widen the scope of the pertinent quantitative findings. All the interviews with the back patients were conducted in the follow-up rooms of the hospitals, where the healthcare providers provided clinical services for back pain with minimal disturbances for both the patients, healthcare providers and the hospitals. The findings of the study were presented as follow based on the categories of ideas identified as important themes to explore and describes the phenomenon of interest comprehensively.

- General characteristics of the in-depth interview participants

The back patients were conveniently recruited to participate in the study. They were heterogeneous in terms of age, sex, education, occupation, and duration of LBP. There were eighteen back patients selected from two hospitals. Half of them were female back patients. The mean age was fifty-one years with a standard deviation ± 13.8 years. The majority of them (61.2%) attended high school and above. Their occupations ranged from housewife up to office manager. Most (89%; n=16) of them did not participate in the first phase of the study, while 11% (n=2) of them had. Some additional characteristics of the participants is presented in table 6.1 below.

Table 6.1 Characteristics of participants included in the in-depth interview, Addis Ababa public hospitals, Addis Ababa, December 2018

Participants	Age	Sex	Educational level	Occupation	Duration of LBP (Year)
1	48	F	Diploma	Housewife	20
2	46	M	Degree	Office Manager	10
3	40	F	Diploma	-	3
4	55	M	Grade 8	Office Worker	4
5	78	F	None	Housewife	4
6	35	F	Grade 8	Student services	6
7	43	M	Degree	Coordinator	3
8	49	F	Grade 11	Factory worker	12
9	47	M	Grade 12	Private worker	33
10	50	F	None	Housewife	since childhood
11	33	M	Degree	Teacher	7
12	58	F	Grade 8	Retired	2
13	60	F	None	Private worker	3
14	60	F	None	Daily labour	-
15	70	M	Diploma	Retired	9
16	75	M	Diploma	Retired	34
17	39	M	Grade 12	Driver	9
18	32	M	Master's Degree	Lecturer	12

LBP: Low Back Pain, - missed data

6.2.1.1.1 Theme One: Chronic medical illness

As summarised in table 6.1 above, the mean duration of back pain among the interviewees was 9.5 years with a standard deviation of ± 10.1 years. The researcher asked the informants to mention the type of associated chronic medical illnesses they might have. Almost all (n=13) of 18 participants were diagnosed with at least one type of deconditioning syndrome.

The most common type of deconditioning syndrome reported by the participants were presented in the following diagram.
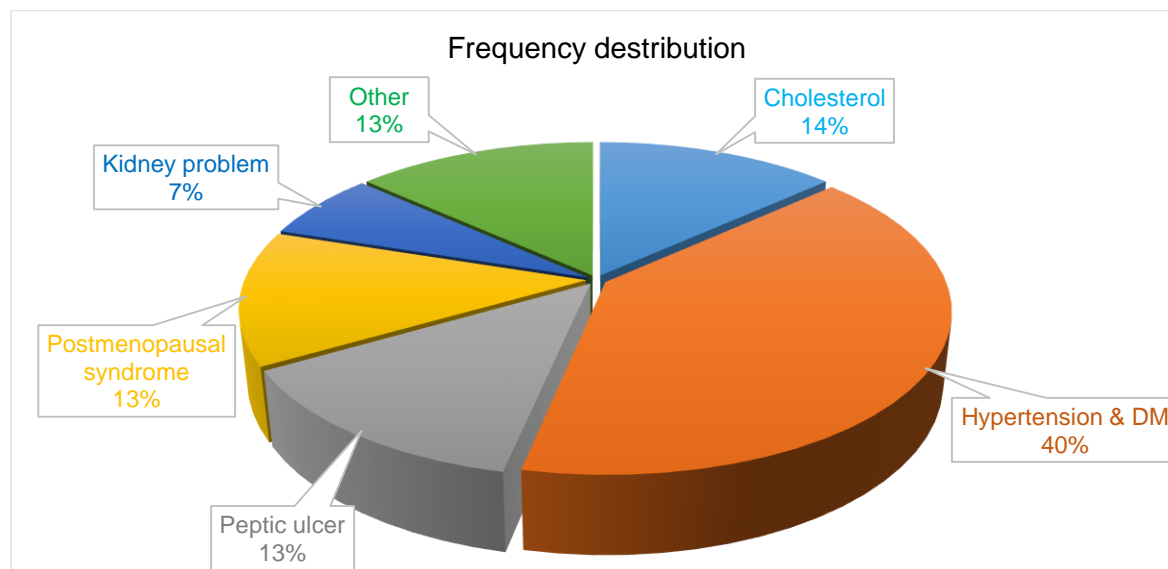
Figure 6.4 Commonest types of chronic medical illnesses (n=13)

Based on the figure above, six (40%) back patients presented with hypertension and diabetes mellitus, while the remaining patients mentioned having cholesterol, peptic ulcer, postmenopausal syndrome or other (anaemia or uterine problems) types of illnesses. Here, one patient had reported more than one type of deconditioning syndromes. The researcher further asked them of their awareness about the association between these illnesses and occurrence of LBP. Back patients reported that there are cases that occurred before or after they developed back pain. There were repeated references to the statement that the presence of a chronic medical illness for a long period of time exposed them to back pain. There were also back patients who still believed that back pain predisposed them to chronic medical illnesses and did not know the scientific explanations.

> *"I am taking pills for hypertension. I am also diagnosed with diabetes mellitus a year ago. Hypertension was started before I suffered from back pain. But the diabetes was started after I had back pain… I think hypertension prone me into diabetes and back pain. But I do not know the exact explanations (Participant 5, age 78)."*

According to the constructs of the health belief model, prevention started with an individual's perception of his/her susceptibility to LBP before he/she developed it. It will be important to

discourage individuals who are practicing in health jeopardising behaviours if they do not perceive that they are at higher risk. Back patients reported that they did not know anything about the relationship between deconditioning syndromes with the occurrence of back pain and vice versa.

> *"I am not sure about this idea. I know the link between diabetes, hypertension and kidney diseases… but I do not know how back pain prone someone into hypertension or diabetes mellitus (Participant 9, Age 47)."*

Further, it will be important to encourage individuals who commonly practice health promoting behaviours. If they are aware of the link between chronic medical illnesses and the occurrence of LBP, they will prevent future development of back pain and create awareness among family members and friends. Unfortunately, there were back patients who believed that LBP had made them susceptible to chronic medical illnesses due to a lack of awareness about the prevention mechanisms and being physically inactive.

> *"Back pain exposed me into diabetes and hypertension. The pain does not give me freedom to become active like some other individuals. I spent day long in sitting position at my home. My weight is also increased from time to time due to the medications that I took to alleviate the pain. I think, these all prone me into chronic medical illnesses (Participant 2, Age 46)."*

6.2.1.1.2 Theme Two: Lifestyle risk factors

- *Subtheme One: Sedentary lifestyle*

The lifestyle that the back patients are following need to be modified, in order to minimise their risks towards back pain. During the in-depth interviews back patients reported that their pain developed due to the routine lifestyle they followed.

> *"My pain was started due to my sedentary lifestyle. I was fetching water on my back. Additionally, I do have different tasks in my garden. I am growing coffee trees, digging the garden, cutting the trees and doing some other tasks. I think those activities had damaged my back (Participant 14, Age 60)."*

One of the participants who was working in an office described how his daily lifestyle has

predisposed him into having back pain.

"… most of the time, I entered into my office early in the morning. Immediately, I started my daily activities. I sit for longer hours in order to control the departure of cars... after my work, I went to home and get a sleep. That is my daily activities. I thought, this routine lifestyle predisposed me into back pain (Participant 4, Age 55)."

- *Subtheme Two: Homemade activities*

Ethiopia is one of the poorest countries. Individuals who live in the country prepare their food within a poor kitchen infrastructure. In addition to this, they carry out multiple tasks at home. Home based activities are the responsibility of women. Thus, such types of demanding activities are the risk factors for back pain.

"… I am not able to sleep in the night because I should have to do my tasks at home. Those chores are very demanding. There is workload and I am not maintaining my posture. I worked in a bended or twisted posture for a long hour. Due to this, my back was injured, and I developed the disorder (Participant 14, Age 60)."

- *Subtheme Three: Eating habit*

Participants indicated that their eating habits were not regular and not always nutritious. There were back patients who indicated that they eat twice a day, they eat their breakfast and lunch together, they eat what they can get.

"I eat my breakfast and lunch together in between six or seven hours. Mostly I eat injera with 'shiro wot'. But I love eating meat, butter and fatty foods. My income is somehow not that much promoting me to eat nutritious foods (Participant 1, Age 48)."

Participants indicated that even though they were not getting a balanced diet, they mentioned that eating nutritious food was important to tackle different disorders. They also reported that individuals who are not eating a good amount of food are easily predisposed to injury or trauma.

"Foods that contains vitamins and minerals have a preventive nature from any type

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of disorders. But I am not taking those types of food because I am not able to get what I want. If you are not eating those foods, your body will become weak and unable to tolerate any injury. Thus, lack of food prone easily into injury (Participant 13, Age 60)."

- *Subtheme Four: Ideal body weight*

Participants reported that they tried to control their body weight through measuring their weight on a weighing scale. This is where maintaining an ideal body weight starts, by integrating it with other controlling measures. There were participants who stated that being underweight predisposed them to have back pain and on the contrary, being overweight also prone them into this disorder. They mentioned their understanding about this concept, as thin individuals are prone to wear and tear, while obese individuals are predisposed to strain on their spine.

"I am measuring my weight every time. When my weight goes up, I reduced eating foods. When my weight goes down, I eat more foods... the more you added weight, the higher you are loading your spine. When your spine is unable to carry this load, joints that are found inside the spine will be damaged. Contrary, when your weight is reduced, there will be also occurrence of friction in between bones. This friction might injure your back. Therefore, there should be a balance between your weight and height. Otherwise, you are liable to back pain (Participant 9, Age 47)."

Participants indicated that even though they had weighed themselves, they reported that their weight did not reduce. They also mentioned that the advice they received from the healthcare providers did not help them much to reduce the impact of being overweight.

"I am not able to reduce my weight. I do not know what shall I do. Almost all my doctors I met during my follow-up time advised me to reduce some weight. The load that I carried on rests on my back, which increases stress on it... I look like a 'pregnant women'. Being obese have different impacts on my daily life. It prevents me not to move as I want to move. Additionally, it reduced my flexibility that I need to bend and extend. I am become quite inactive than anyone else (Participant 5, Age 78)."

- *Subtheme Five: Drinking alcohol*

The participants mentioned that they were drinking alcohol for social settings with family and friends during holidays or at weekends. They indicated that the amount of alcohol consumed by someone is an indicator of back injury due to falling down or some other direct trauma to the sufferer.

> *"I went out with my friends and enjoy life with drinking alcohol. It does not have a direct effect but it prone into back pain indirectly. But it depends on the amount of alcohol consumed by someone. After drinking alcohol, different things might have happened. Individuals who drank alcohol might prone to fall down accident and injured their back. There may be also fighting and incident of injury on their back. These are some of the reasons how back pain might occur due to drinking alcohol (Participant 7, Age 43)."*

- *Subtheme Six: Smoking cigarette and chewing khat*

Even if the number of smokers is only one participant, he stated that smocking might prone him into back pain due to the weakening of his discs. He also mentioned that smocking does not have any additional benefits for anyone, and he is eager to stop smocking but he is unable to.

> *"I do not know the exact scientific explanations, but it might had predisposed me into back pain by weakening the discs. I smoked cigarette when I feel stress. Even if it is hard to cut smoking, I will try my best because I stopped chewing khat and drinking alcohol based on my internal feeling. I know it does not have any additional importance. I know its effects and impacts on my life. You know, it is hard to stop within a short period of time (Participant 9, Age 47)."*

In addition to smoking, the participants reflected their perceptions and perspectives on the effects of chewing khat. They indicated that khat chewing required that they sit in unusual or sometimes cramped positions. This awkward sitting posture is a predisposing factor for the occurrence of back pain.

> *"You are chewing it in a sitting position. You will stay the whole day in this position. Its ceremony needs longer hours to be finished. It May make you to come together*

and discuss ideas freely. When you chewed these leaves with narcotic effects, you will have some sort of happiness. For example, after I chewed khat I became alert. Additionally, it may have analgesics effect for the pain I feel. This may be due to the increments of my heartbeat, improved circulation, feeling relaxed, and etc. Else, it does not have any benefit. Thus, the side effects overweigh its benefits (Participant 11, Age 33)."

- *Subtheme Seven: Exercise programme*

Participating in any type of physical exercise is essential in order to prevent non-communicable diseases. Participants reported that they are not actively engaged in any exercise. There were reports that, some of the participants were involved in irregular exercise programmes at their home or elsewhere. They believed that participating in any form of exercise has different benefits for our body.

> "*I am trying to run around 'Meskel Square'. This is a mass sport programme... it is good to do all types of sport. It has many benefits. It strengthens muscles and improves endurance. It also gives you extra happiness for life. When your body moves, your mind gets relaxed and motivated for your work (Participant 18, Age 32)."*

- *Subtheme Eight: Type of mattress*

Participants indicated that they were using a variety of different types of mattresses. They also stated that selecting the best type of mattress was essential to reduce the symptoms that arise from back pain and the development of new episodes of back pain. The selection of mattress depends on the region one resides in, income and educational level. The more expensive and comfortable mattresses were used by individuals who had better income. Whereas, individuals who have low socio-economic incomes use the cheapest and inconvenient types of mattresses. They indicated that the extra bonded mattress was better than other type of mattress to prevent occurrence of back pain.

> "*I am using extra bonded mattress. It is good for me because it holds my back in a good and rigid way. It does not have too much comfort, but I can able to sleep as I want because it does not have that much spongy… for a healthier individual,*

selecting mattress is depends on their comfort level. Because they might feel comfortable when they sleep on a spongy or firm mattress... however, using a soft mattress causes your body to bend somewhere on the mattress and it bounces for the night long. Then your back is bended somewhere. Whereas, sleeping on the hard mattress is like spending the night like in standing position. Your body is not getting adequate rest... but extra bonded is free from all of these effects (Participant 2, Age 46)."

- *Subtheme Nine: Sleeping habit*

Participants indicated that they had problems with getting adequate sleep due to the pain they felt and some other unknown reasons. Lack of adequate sleep predisposed them to other health-related problems.

"*There is some problem on my sleep. I am trying to get good sleep, but I do not have sleep. I do not know the reason why I am not able to sleep. I prefer to sleep during daytime. This is due to the nature of my previous work. I can able to get a good sleep during daytime… if I can able to sleep during night-time, it is good for me. When you sleep during daytime, there are different types of voices that disturbs you. So, I prefer to sleep during night-time. I changed position frequently (Participant 14, Age 60)."*

- *Subtheme Ten: Transportation mode*

Participants indicated that they had no choice to select a convenient mode of transportation for themselves. Because there was a huge shortage of public and private transportation in the country. They reported that using the available mode of transport predisposed them into sitting in awkward positions, prolonged standing and crowding. They also indicated the effects of utilising a congested transportation system on their backs.

"*I preferred taxis because I want to get sits… nowadays, travelling by taxis is becoming the worst mode of transportation... you should have to find a comfortable position in order to travel longer journey and sit for longer hours where there is a traffic congestion... otherwise, there will be turning to one side and twisted in some other directions. This awkward body posture creates discomfort on your body...*

when this posture repeated frequently, you are prone to joint disorders (Participant 1, Age 48)."

Participants also shared their advice for individuals who commonly utilised the public transportation system so that they can prevent the occurrence of back pain.

"I advised them to prefer simple and free transportation method. When they sit on a congested position, they feel discomfort. It is better to avoid using a congested transport mode. I think it is better to select the transportation mode which have a convenient sit and try to sit in a comfortable position (Participant 5, Age 78)."

6.2.1.1.3 Theme Three: Work-related risk factors

Participants indicated that the working environment contributed significantly towards the development of their back pain, if it was unsuitable and involved prolonged sitting or standing, workload and dissatisfaction with their current position. Their views and thoughts on these issues are presented in the following subthemes.

- *Subtheme One: Unsuitable working environment*

During the interviews with back patients they reported that their working environment is not comfortable due to an unsuitable working environment.

"You know how the working environment looks like in our country. First, the sitting chairs are not comfortable... furthermore, the overall layout of my office is uncomfortable. There are a lot of things that are not convenient for me in order to perform my tasks. I cannot say only the sitting chair or lightening. But it is just more than that. There may be lifting loads, pushing or pulling objects, carrying weights, overhead activities, frequent bending and twisting and so on. Additionally, psychological interactions with animate and inanimate objects have also some negative influences on the occurrence of back pain (Participant 2, Age 46)."

- *Subtheme Two: Prolonged sitting*

He further added that such types of unconducive working places are prone workers to sit for more than half an hour and their susceptibility to back pain is increased due to exposure to cold and static body posture.

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"…to accomplish my tasks, I should to sit for longer period… this is due to the nature of my job. If someone sits in one position for a long period of time, he is torturing his body. He might also absorb cold air through his back. Further, when he sits longer, his body will not use energy and accumulate it as a fat cell. These all will prone him into back pain (Participant 2, Age 46)."

- *Subtheme Three: Workload*

Participants also reported that even the working system in the country is on ground level, the presence of this type of workload had predisposed them into developing back pain.

"I was working as a daily labour... the loads that I carried on my back was hurting me a lot. There were also different deviated postures I used to perform the tasks, which needed twisting from my spine. Additionally, there was also stress arises from the work itself and the working environment. Thus, working for longer hours, carrying heavy loads, walking longer distances and not getting enough foods predisposed me into this disorder... I think, that is how my pain was occurred (Participant 14, Age 60)."

Similarly, individuals who took office-work home found it affected their sleeping habits and they believed that they were increasingly at risk of developing back pain.

"I think the main causative factors for LBP is workload. Even I took my work to home.... my pain occurred due to the time I spent on the computer and the nature of the work itself... I know that spending too much and worked for longer period will aggravate the pain. But I do not have any choice. The work is wealthier than the pain. So, workload will aggravate the pain level and predisposed into back pain (Participant 9, Age 47)."

- *Subtheme Four: Job dissatisfaction*

From the reports of participants, it was noted that the nature of the job, the situation of the working environment and the pressure of the workload makes them dissatisfied with their job. When workers are unsatisfied with their work, they might prone into working in a deviated posture making themselves susceptible to back pain.

"Being dissatisfied with work will prone to different disorders. If you have negative

feelings towards your job or your boss assigned you based on his or her interest, you will be affected by different work-related disorders. The commonest musculoskeletal disorder among the working community is backache. On the other hand, LBP could also lead into job dissatisfaction (Participant 9, Age 47)."

6.2.1.1.4 Theme Four: Psychosocial risk factors

The back patients were asked to reflect on their attitudes and understandings on the association between having adequate time for relaxation, support from family or friends, participating in social ceremonies, and effects of stress and depression and development of LBP. Their views and thoughts are presented as follows.

- *Subtheme One: Time for relaxation*

Having adequate time for relaxation with friends or family has many health benefits. Participants indicated that having enough time for relaxation has dual benefits, first, it prevents the occurrence of back pain and secondly, it could reduce the pain level by having fun with family or friends. However, there were participants who had no prior experiences and therefore did not indulge in such types of activity. They perceived that having free time for relaxation does not have any importance for the health.

> *"I do not have time to go out for relaxation. I think it has no any importance because I am not familiar with such type of social life. What I knew is that caring children's and doing tasks at home. But going out and having fun is a culturally prohibited social behaviour in our society (Participant 5, Age 78)."*

- *Subtheme Two: Support from family members*

Participants who lived together with a family member received support for their pain and they encouraged them to perform activities with great care to prevent further complications and incident of new injuries. They reflected that living with someone is vital for receiving psychological and social support. However, those individuals who were living alone were prone to do things by themselves and liable to different health-related problems. They perceived that their pain is directly related to their loneliness.

- *Subtheme Three: Attending social gatherings*

Participants also reflected their opinion on how participating in social gatherings prone them into back pain due to the tasks that are performed in such social programmes. They also stated their experiences on the benefit of attending social gatherings as it allowed them to discuss their health issues and gain preventive and therapeutic recommendations from their social circle.

> "*I think, participating in social programme does not have that much negative effects on our health. But there are different activities that needs to bend, twist, turn or even exposed to lift heavy loads on our vertebrae and prone us into back pain. However, individuals who attended social gatherings could get additional benefits. They may feel happy when they share their ideas with the participants, and they get chances to reduce stressors. This have a positive impact on their body which act like a preventive mechanism from any type of injuries. Therefore, I see such type of acts as a good behaviour for all of us (Participant 10, Age 50)."*

- *Subtheme Four: Stress and depression*

Participants stated that their lifestyle prone them to face different challenges. They mentioned that in order to tackle this challenge, they are making adjustments and this approach prone them to psychological disorders like stress and depression. These disorders further damaged their overall health and prone them into back pain.

> "*I am feeling stress. I do not know where it comes from... I am not able to control my internal locus system. I feel fearsomeness and sadness without any reason. This further makes me to feel depression. If you talked to me negatively, my tears dropped without any control. I do not know why it is happening on me (Participant 12, Age 58)."*

6.2.1.1.5 Theme Five: Socio-cultural risk factors

Regarding modifiable socio-culture risk factors, the researcher explored life expectations, presence of overcrowding, domestic violence and traditional beliefs form the back patients' perspectives. The raw data from the back patients is presented below.

- *Subtheme One: Life expectations*

Participants reported that their expectations of life is not reflected in the lifestyle they are living right now. They stated that they are not living life as they wished and are not able to fulfil their basic needs. This uncertainty prone them to worry daily.

> *"I am not living as I want to live because there are things that I am not able to fulfil. These things make me to worry a lot. When you are not living life as you wished, you are under stressful conditions. This struggling will harm your mental and physical health. I think the main cause for occurrence of my back pain is due to things are not going well (Participant 8, Age 49)."*

- *Subtheme Two: Overcrowding*

Participants indicated that their hometowns were overcrowded. They also mentioned that this often left them demoralised not wanting to have fun with friends or family. They further indicated that living in a crowded room is not safe for everyone, that those individuals living and working in such places are prone into different deviated body postures due to the lack of freedom to walk, sleep, and to accomplish their work.

- *Subtheme Three: Domestic violence*

One participant mentioned that her husband came home after he drank alcohol and fought with her. She indicated that her back was injured due to the trauma she encountered from husband. She also added that domestic violence left her feeling a lack of freedom and she was frightened daily.

> *"My husband came after he drank alcohol and he fight with me. There are some psychological effects happened on me after I fought with him. I lost freedom for my life and became frightened with daily life. Even I am become stressed due to repeated incidents. After that incident, I am complaining back pain (Participant 5, Age 78)."*

- *Subtheme Four: Traditional beliefs*

The most important culture based modifiable risk factors that contribute to the development of LBP are traditional beliefs that exist in the community. Participants indicated that there are

different traditional beliefs that contribute to the occurrence of back pain.

> *"There are different sayings by the community. For example, a magician may have thrown something dreadful in the morning in order to harm other people. If you touch this thing, you will develop back pain… whereas, individuals lived in the area where I am living right now believed that back pain is occurred due to a mystic act done from someone else who wants you to become disabled (Participant 8, Age 49)."*

6.2.1.1.6 Theme Six: Knowledge on back ergonomics

Sound knowledge on back ergonomics is important to help prevent the occurrence of LBP among healthy individuals. In order to follow the ergonomic measures provided by the healthcare providers, a healthier individual should know more about what low back pain is and the mechanisms of its development. Participants reported that they were not interested in learning about back pain prior to suffering with it.

> *"I tried to get some information about the causes of backache. I knew that the causes are lifting heavy loads, improper sitting posture, sleeping problem and poor eating habit. I got this all information from my doctor friends, but I did not ask anyone before. I started to know more about the causes of LBP after I was affected by it. Even I do not have prior interest to know the main causes of back pain (Participant 2, Age 46)."*

The researcher also asked the participants to offer their views and perceptions towards the benefits of knowing the risk factors of LBP. Based on this inquiry, they stated that knowing the causative reasons of back pain was vital in order to teach their families, friends, colleagues and the community in general, to discourage health jeopardising behaviours and to encourage health promoting habits.

Participants also shared that knowing the proper way of lifting heavy loads with precaution is also beneficial for everyone. Some mentioned that lifting heavy loads with care is important to prevent the occurrence of back pain. But some participants indicated that they did not know anything about the benefit of back ergonomics and how to lift loads by bracing from the knees. Similarly, participants told the researcher that they did not know how to sit

correctly in an up-right position.

> *"I do not know how to lift objects because I am lifting as I know before... I lift objects without any precautions. Even, I did know how to sit properly. I sit on anything I get to sit. I changed my position frequently (Participant 13, Age 60)."*

On the other hand, other participants reported that they did not receive awareness programmes about how to get up from bed, sitting in a correct posture and lifting objects with precaution from the healthcare providers.

> *"No one teaches me how to sleep or sit properly. I am trying by myself based on my prior experience... no one told me how to maintain my posture during lifting or carrying. I am doing by myself by thinking its benefit for my back (Participant 2, Age 46)."*

6.2.1.2 Findings of key informant interviews of healthcare providers

Key informant interview participants comprised of different healthcare professionals who were working in the Neurology, Orthopaedic, Neurosurgery, and Physiotherapy departments. They were heterogeneous in terms of age, types of profession and period of work experiences (2 – 15 years). These providers were expected to work in the outpatient follow-up clinics in order to provide clinical services for back patients for at least six months. They were conveniently recruited to participate in the study. None of them had participated in the previous phases of the study (survey or in-depth interviews).

To gather detailed insights about their clinical expertise and thoughts on the modifiable bio-medical and culture based risk factors of LBP, the researcher conducted key informant interviews with them. He believed that they have immense knowledge on the research interest. That is why he preferred to conduct key informant interviews with them. Some background information and findings of the interview were presented as below.

- Characteristics of healthcare providers included in the key informant interviews

There were eight healthcare providers included in the study. They were selected from two referral hospitals of which the back patients were included in the survey and interviews. Seven (87.5%) and one (12.5%) of them were males and females respectively. Their mean

age was 34.5 years with a standard deviation ± 3.9 years. Mostly specialists were assigned in the outpatient clinics based on their qualifications and educational backgrounds. Additional characteristics of the healthcare providers who were included in the study are presented in table 6.2 below.

Table 6.2 Educational background and some characteristics of healthcare providers included in the study, Addis Ababa public hospitals, Addis Ababa, December 2018.

Provider	Age	Sex	Educational level	Profession	Years of experience
1	32	M	Doctor	Physiotherapist	11
2	35	M	Doctor	Neurologist	10
3	35	M	BSc	Physiotherapist	11
4	32	F	Doctor	Physiotherapist	11
5	43	M	Doctor	Orthopaedic Surgeon	4
6	31	M	Doctor	Orthopaedic Surgeon	6
7	36	M	Doctor	Neurologist	4
8	32	M	Doctor	Neurosurgeon	5

The table above illustrates that the healthcare providers served in the selected departments for a mean of 7.8 years with a standard deviation ± 3.3 years. Their professions were also mainly linked to back pain care. They will have immense knowledge regarding the bio-medical and culture based modifiable risk factors of LBP and the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours for the development of LBP. Therefore, the verbatim responses from the healthcare providers are presented thematically as follows:-

6.2.1.2.1 Theme One: Chronic medical illness

The researcher wanted to know how chronic medical illnesses have been associated with the occurrence of LBP from their clinical experiences. They mentioned that chronic medical illnesses are both a causative factor and can also happen after the occurrence of LBP.

> *"There are factors that contributed for the development of LBP. When we take*

diabetes as an example, the victims may be affected by central obesity. There abdomen will be distended. This distention will cause direct injury on the lumbar spine... further, muscles will become covered by fatty cells and lost their strength and capacity to support the nearby structures. It cannot able to support and protect the spine. So, they will have instable spine that can be irritated or injured easily. Similarly, other deconditioning syndromes like kidney disease or uterine disorders will have referred pain into the spine (Provider 4, Physiotherapist)."

Other providers indicated that the development of LBP due to the presence of deconditioning syndrome is due to chronically debilitated individuals who became physically inactive. This inactivity will prone them into cardiopulmonary insufficiencies and they will develop back pain or other chronic illnesses. Thus, poor physical health is mentioned by them as a contributing factor for the incident of backache.

- Accidental Falls

The healthcare providers mentioned that accidental falls that directly hurt spinal structures cause back injury. The victims develop back pain due to direct injury on the spinal structures or secondary to immobilisation with lumbosacral corset or being bed ridden for a long period of time.

> *"Sufferers might fall on stone, gorge or on the ground after drinking alcohol, road traffic accident, or some other cause. It injured the structures of the spine. Then the victim will be immobilised for at least six weeks. Therefore, back pain might occur due to a direct trauma to the spinal structures or after immobilisation for a longer period of time (Provider 5, Orthopaedist)."*

- Utilisation of contraceptives

Regarding the link between the occurrence of back pain and utilisation of contraceptives, the healthcare providers reflected that long term contraceptive use predisposed them to back pain due to hormonal imbalances for the user.

> *"... I think; it has a long term impact... when the oestrogen level is reduced, the bone density will reduce. This change will cause ligament laxity and osteoporosis on the spine... another scenario is that women who are taking contraceptives might*

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prone to coagulopathy disorders and obesity. This will create pressure on the joints and muscles and causes back pain (Provider 4, Physiotherapist)."

6.2.1.2.2 Theme Two: Lifestyle risk factors

- *Subtheme One: Sedentary lifestyle*

The healthcare providers stated that the way individuals lived their life was the main contributing factor for the occurrence of back pain. They indicated that most individuals are becoming physically inactive, sitting for more hours in their office and becoming more sedentary in their day-to-day life. This lifestyle will have predisposed them to different health-related problems.

> *"What we called sedentary lifestyle is lack of activity... if you become sedentary, you are not moving from one place into another. The main site for posture change is your back. You may become kyphotic or lordotic. This brings structural changes on your body and developed back pain (Provider 1, Physiotherapist)."*

- *Subtheme Two: Eating habits*

The healthcare providers mentioned that eating habits also prone individuals into back pain. They mentioned that the position they took when eating and the content of the food they commonly ate, are risk factors for the development of back pain. Other healthcare providers indicated that individuals who eat less food and those persons who eat too much food will prone to back pain.

> "*If individuals are not eating nutrient reach foods, they will prone to nutrition-related problems. Because bone density and level of minerals that is found in their body will be reduced. Further, there will be effects on the metabolic system... the nerve cells will not function well. The muscles may lack its contractility natures. The blood supply may not deliver to target tissues, and so on. Additionally, there is a certain type of eating habits that predispose into cancerous cells. The occurrence of cancer in our spine will manifest as back pain (Provider 5, Orthopaedist).*"

- *Subtheme Three: Drinking alcohol*

Healthcare providers also reflected their thoughts on drinking alcohol how these predisposed

individuals to back pain directly or indirectly and the quantities involved.

> *"This might be due to many reasons. Drinking alcohol may reduce appetite by impairing food absorption… drinkers are prone to malnutrition disorder. Their body will not get adequate nutrients. Their sleeping posture will be awkward, and they may also encounter fighting or fall down accident and predisposed into back pain. But this will depend on the amount of alcohol they consumed (Provider 5, Orthopaedist)."*

- *Subtheme Four: Ideal body weight*

Healthcare providers reported that poor eating habits is a risk factor for the development of back pain through pressure on the spine, causing postural problems.

> *"You are loading your spine with an extra load. Your bones are a primary support for your weight. When your body weight increased, there will be pressure on the bones and joints that are found on your vertebra. This will prone to postural deviations. You will become lordotic. This deviation leads to back pain (Provider 6, Orthopaedist)."*

- *Subtheme Five: Smoking cigarettes*

Healthcare providers reflected their insights and thoughts regarding the link between smoking cigarettes and the occurrence of back pain based on their clinical experiences. They stated that, smoking causes different disorders by impairing the circulatory system, which increased problems associated with a lack of adequate nutrients and oxygen. This further reduced the bone composition and they became osteoporotic, with increased risks of their bones being easily fractured. This is common on the vertebral bones and manifests as back pain. From these observations, they confirmed that smoking does not cause back pain, instead, it is an indirect risk factor.

- *Subtheme Six: Physical activity and/or inactivity*

The researcher raised a question relating to the way that physical activity and/or inactivity impacted an individual's susceptibility to back pain. They stated that both physically active and inactive individuals were at risk of developing back pain through different mechanisms.

Firstly, they indicated that inactive individuals spend the whole day in a sitting position, making their core muscles weak. A weakness of core muscles easily injures the back during lifting or doing something which is beyond their capability. On the contrary, other healthcare providers mentioned that being active with physical activity programmes can cause sport-related injuries.

> "*During sport, there is a chance of occurrence of sport-related backache. This is due to incidence of strain or sprain on the spinal structures... for example, gymnasts are prone to spondylolisthesis because they are flexing their spine excessively... similarly, those individuals who lift weights are loading their spine... if they are not practicing proper lifting mechanism, they are hurting their spine... therefore, physically active individuals will be directly or indirectly prone to LBP (Provider 4, Physiotherapist).*"

Other healthcare providers also mentioned that, participating in any type of physical activity programme had diverse benefits for the participants. They indicated that exercise could maintain ideal body weight, make individuals stronger and improve cardiopulmonary performance.

> "*It can reduce body weight, improve posture and strengthen muscles… so physical activity is used to prevent incidence of LBP and reduce symptoms arises from it (Provider 6, Orthopaedist).*"

- *Subtheme Seven: Sleeping material and sleeping habit*

Healthcare providers were asked to explain how sleeping material predisposed people to back pain. They reported that a selection of sleeping material (hard or soft) was essential in order to sleep comfortably by maintaining the ideal body posture i.e. lordotic at the cervical, kyphosis at the thoracic and lordotic at the lumbar spine. They indicated that if healthier individuals are unable to maintain this posture, they will be susceptible to postural disorders, which ends up as back pain.

> "*... the mattress we used to sleep will affect the spinal curvatures. If it is soft type of mattress, your body structures will be folded somewhere and if the it is a hard mattress, you will sleep in an extended posture in abnormal way... so mattress is*

directly related with the occurrence of back pain (Provider 4, Physiotherapist)."

Other healthcare providers indicated that sleeping habits are a contributing factor for the occurrence of back pain. They reported that poor sleeping habits prone reduced production of growth hormones and neurotransmitters. Lack of these chemicals prone individuals into different types of medical conditions.

> *"... taking rest is necessary for all human beings… lack of sleep may occur due to thinking too much or doing some other tasks … if we are not able to get enough sleep, we are prone to different disorders due to reduction of production of hormones and neurotransmitters… but not only lacking of sleep prone someone into LBP, but also sleeping too much is a predisposing factor (Provider 1, Physiotherapist)."*

- *Subtheme Eight: Transportation mode*

From the modifiable lifestyle factors, the researcher asked the healthcare providers to reflect on their perspectives towards the association between selecting transportation mode and the occurrence of back pain. They stated that selecting the most convenient mode of transport is important to reduce the incidence of back pain among the general public.

> *"In our country, transportation system is a direct risk factor for LBP. For example, when we enter into bus or train, we are forcing to travel on standing. You will stand for longer period of time on the vehicle… there is also a huge congestion which pushes someone from your back and some other from the front. Similarly, when we choose taxi, we will sit as an extra individual... one side of our buttock will drop and the other will remain on the chair… the muscles that are found on the side where we sit will be contracted and the other side will be relaxed.... thus, there will be occurrence of twisting or awkward body posture. In addition to this, the vehicle will produce a vibrating force that exerts pressure on our back… therefore, in order to tackle the above problems, we should have to select the most convenient transport (Provider 1, Physiotherapist)."*

6.2.1.2.3 Theme Three: Work-related risk factors

The researcher asked specialists to share their viewpoints about the association of modifiable work-related factors and the development of back pain. They mentioned that an occupation that requires prolonged sitting, prolonged standing or other sort of deviated body posture predisposed individuals to back pain. Based on their explanations, there are two types of workers; workers who spent the whole day in a sitting position and employees who had more physically active jobs. They indicated that individuals who are inactive in their working station are more prone to back pain than those individuals who have an active working style. Inactive individuals are easily irritable and liable to psychological or physical trauma due to stressful and unconducive working stations.

Some other healthcare providers mentioned that workers who are dissatisfied with their job are prone to back pain.

> *"If we are not become satisfied with our work, we will produce cortisol. This hormone degrades the calcium level in our blood stream. When we produce huge amount of cortisol, we will expose into hypothyroidism disorder. However, individuals who are satisfied with their job are producing endorphin... this will kill micro traumas and inflammation after trauma on the spine (Provider 7, Neurologist)."*

One healthcare provider also added that individuals who spent their working days in prolonged sitting or standing positions are prone to back pain due to postural problems.

> *"When we see the work we done, it may require prolonged sitting or standing... individuals who works as a teacher and a shop keeper may stand for longer hours… and a secretary might be finalised her job in sitting position. During prolonged sitting, the biomechanical effect is the reveres of standing... prolonged sitting affects our discs and prone to disc prolapse whereas, prolonged standing affects the facet joints and the spinal canals.... during prolonged standing, the spaces that are found in the posterior anatomical structure will lost and the spinal canal will narrow (spinal canal stenosis) … spine is affected by body weight and gravitational force… there is also a ground reaction force. During standing, this forces*

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enable us to keep our body in balance for a certain period. If individuals
stand for a longer period of time, he/she will complain that his/her body is
become weak… in general, when we done our job, we are not cautious
about our posture and we are doing in an awkward posture. Our community
does not aware about working in a normal posture. Mostly they work in
slumped posture, which is a higher risk for LBP (Provider 8,
Neurosurgeon)."

The same healthcare provider presented his thoughts on the presence of workload on the
working environment and that it predisposed individuals to different health-related disorders.

"Everything must be done in optimal level. Otherwise, we will be affected by
different problems... for example, we are conducting round near patients' beds for
longer hours. We stand for at least two or three hours. This is one type of workload
because we are not taking rest in between rounds. This will have negative impacts
on our health."

6.2.1.2.4 Theme Four: Psychosocial risk factors

The researcher asked the healthcare providers to reflect on their opinions on how life
expectations, stress, depression and overcrowding predisposed healthier individuals to get
back pain. They stated that not living life as we wished is the commonest risk factor for the
development of backache.

"If you are not living life as you wished will exposed into struggling. Then you
will work additional work beyond your normal schedules... when you become
unhappy with life, you are becoming stressed and depressed. This will expose
you into different health-related problems (Provider 6, Orthopaedist)."

Some other healthcare providers also stated that individuals who are not living life as they
want are prone to psychological disorders like stress and depression. These disorders also
make individuals more susceptible to musculoskeletal disorders.

"... most stressed individuals' primary complaint is musculoskeletal pain... on the
other hand, LBP also leads to psychological disorders and the association is bi-
directional (Provider 8, Neurologist)."

Healthcare providers also shared that overcrowding around living areas and/or in the working environments predisposed people to psychological disorders, after which their physical health was impaired and they were more likely to develop back pain.

> "*This might be due to presence of many individuals. This will lead them into depression. If they have prior awareness about the preventive strategies, they will not expose into LBP. If they are aware and educated by a professional, they can exercise during walking in a congested place. I think they will not prone to this type of disorders. They will get extra benefit (Provider 5, Orthopaedist)."*

On the other hand, some other healthcare providers stated that participating in an active social life and recreational activities is essential to prevent the occurrence of back pain, it acts like a moderate type of exercise programme and could reduce stress and depression. However, they indicated that domestic violence is a contributory factor to the development of LBP and they explained that when there is fighting at home, there will be an occurrence of direct injury to the victim's spine or indirect psychological trauma. Thus, domestic violence can prone individuals to back pain directly or indirectly.

6.2.1.2.5 Theme Five: Socio-cultural risk factors

The researcher wanted to explore the healthcare providers' knowledge and thoughts regarding the modifiable cultural risk factors and how cultural beliefs influence the development of health promoting and health jeopardising behaviours in the development of LBP. Healthcare providers indicated that eating habits, sitting posture, type of job, and the mattresses we use to sleep on are some of the cultural factors that influence the development of LBP.

> "*… there are different types of culture in our country. As you know, there are around 80 nations and nationalities with different ethnic backgrounds and cultural practices. So, in each group, they do have their own culture for daily life and work. Their daily activities will predispose some individuals into musculoskeletal disorders, and it might be used as prevention methods for other communities (Provider 5, Orthopaedist)."*

Some other healthcare providers also mentioned that, culture has both a protective and predisposing effect on the development of back pain.

> "*As I told you earlier, it is vital to know the culture of each group of the community. For example, there are individuals who carry loads with their shoulder or there are some other persons who carried weights with their head. Those individuals will not equally predispose into back pain. In order to know which culture is predisposing and which are not, it will be better to know how they cook their foods, how they sit, how they work their job, how they perform other sort of duties, and so on. Further, there are some type of cultures which asks younger/ older individuals to done hard work. Further, culture can be seen as both a prevention and/or a risk factor for LBP… I think it is not easy to trace easily which culture promotes our health and which one jeopardises our body. You should have also included their socio-economic status. Individuals with low socio-economic index are more prone to demanding work and individuals who have better income might prone into inactivity. It is hard to know which culture is preventing and which are not. Thus, all cultures are not beneficial or harmful (Provider 8, Neurosurgeon).*"

6.2.1.2.6 Theme Six: Knowledge on back ergonomics

The researcher asked about the healthcare providers' viewpoints regarding the effect of back ergonomics based on their prior knowledge. The healthcare providers indicated that the correct sitting posture is essential in order to prevent the occurrence of back pain. They advised healthier individuals to avoid sitting for more than half an hour at a time and to change position frequently, based on their tolerance level.

> "*First, individuals must create a gap on their back by putting something hard on their feet… this will create a free space in between the foramina that are found in the spine and the nerves gets out and functions well without any difficulties. Second, the sitting chair should be better if it has a back support. If these problems are corrected and they take intermittent walk in between their tasks... it will be advantageous to stand and walk around at least every 30 minutes. This is what we are advising to individuals who are working in sitting*

position for longer hours (Provider 1, Physiotherapist).

Some of the healthcare providers also added that lifting heavy loads should be done by bending from the knees in order to avoid a faulty posture and stretching of back muscles and ligaments. If individuals failed to do so, they will tear the discs, muscles or ligaments that are found on the lumbar spine and develop back injuries. In order to prevent such types of incidents, they advised individuals to lift properly using back ergonomics.

"*The normal lifting mechanism is that by putting one leg in front of the other and bending from both knees. We should maintain our normal curvature of the spine by picking objects with great care (Provider 2, Neurologist).*"

Similarly, healthcare providers presented their thoughts on the precautionary measures for pushing, pulling or over-reaching activities stating that individuals should follow ergonomic techniques to prevent injury to themselves.

"When we want to lift or pick objects, we should have to activate our core muscles. There is a short muscle that runs from L3 up to L5, which is called multifidus. This short muscle is important to prevent occurrence of LBP when it is strong enough. In order to strengthen this muscle, we should have to activate pelvic floor and abdominal muscles too. We can activate pelvic floor muscles by holding them up like we want to control our urine during urination. When we want to push or pull objects, we should have to activate all core muscles. Further, we should have to maintain a good standing pace to prevent any associated injuries that might occur in our lower extremities. It will be better to push by putting our legs separated. When we put our legs far apart, we can maintain our stability. If we are not able to maintain this position, we can put one leg in front of the other. This will give us extra energy to push or pull objects. If we put our legs together, we are hurting our body. This will be best if we could able to practice during all other homemade or work-related activities. (Provider 2, Neurologist)

And

*"There should be balance between what we supposed to push or pull and the weight of the object. If it is beyond our capacity, there will be occurrence of some sort of disorder in our body. If we are pushing small weight, there will not have effect by pushing it with bended elbows. There will not difference between bending and extending elbows if we are able to push or pull by activating our core muscles. Activating core muscles is the primary concern during any type of movement patterns. There will be additional benefit if we push or pull by extending our elbows and activating our cores than bending our elbows. That is what I think." (*Provider 4, Physiotherapist).

They further indicated that a lack of knowledge on back ergonomics is the predisposing factor for the development of back pain among healthier individuals due to incidents of micro trauma.

"*... lack of knowledge on back ergonomics prone us to lift, push or pull objects in a deviated posture. This posture will cause micro trauma on the involved anatomical structures. When micro traumas happened on our back repeatedly, they will prone us into back pain (Provider 8, Neurosurgeon).*"

- Definition and pathophysiology of LBP

Healthcare providers mentioned their understanding and thoughts towards the definition and pathophysiology of LBP. They stated a general definition of back pain as *"it is pain or discomfort that occurs between the buttocks up to the neck"*. In addition to this, they reflected their understanding on the pathophysiology of LBP and how sufferers perceived it.

"As you know, there are different types of pain like visceral pain and deep pain... whereas, deep pain is a type of pain that is originated from deep anatomical structures, which includes bones, ligaments and discs. All these types of pain have its own pain pathway... generally, there are two type of pain pathways: slow and fast pain. Low back pain is a slow type of pain. It is not a fast pain. Slow pain is a type of pain that is impossible to localised by the sufferer. You are feeling the pain, but you are not able to show where is the pain located… the fibre that transmits

slow type of pain is unmyelinated fibre. The fibre is small, unmyelinated and propagates the pain slowly. Before it reached into the brain, first, the pain is reached on the spinal cord. It is better to understand what will happen when it reached into the spinal cord…

The second anatomical structure where the pain goes is reticular formation. When the pain reached at this point, you will be conscious about the pain. You are becoming conscious towards the pain you are feeling. Your overall attention will be focused on the pain you are feeling. You will not able to sleep. Then the pain goes into hypothalamus. When the pain reached into this area, the vital signs will be increased. Your mood will be distorted. Then it can also go into the limbic system... at this moment, your emotion will be lost or become very emotional due to the pain effect... the information will be processed and expressed in terms of emotions. Emotions includes sadness, fearsomeness, hopelessness, and so on".

"… the information will go into the thalamus. When it reached on this structure, the information is crude. I mean, the pain is become crude or general or nonspecific type of pain. After that it goes into the cerebral cortex. There are different areas where the information's are reached and processed... if you asked the victims about his or her pain, he or she will explain all about his or her pain. They can locate, characterised and extricate the pain. They can talk many things about their pain."

Provider 2, Neurologist

6.2.2 Data analysis

In this phase of the study, data collection and analysis occur simultaneously. In order to categorise and summarise pertinent ideas and perceptions of the study participants, the researcher followed the steps of the data analysis process mentioned in chapter four.

This study intended to explore how cultural beliefs influence the development of health promoting and health jeopardising behaviours in the development of LBP. Data was

generated through in-depth interviews with back patients and key informant interviews with healthcare providers. For this study, thematic analysis was used to explore the modifiable risk factors of LBP in order to gain an insight into the influence of cultural beliefs on the development of health promoting and jeopardising behaviours in the development of LBP among individuals in Addis Ababa.

The qualitative data was analysed utilising Atilas.ti version 7 software. The coding and themes were developed by the researcher (MM) and the independent coder (TM) and the codes were compared and in cases of disagreements there was a reference to the source of data to gain more clarity on the theme. During the data analysis process, lived experiences of the back patients and knowledge of the healthcare providers were transcribed into text to explore how cultural beliefs influence the development of health promoting and jeopardising behaviours. The interview was based on a semi-structured interview schedule. The interview schedule was designed to involve main areas of emphases to the research questions. During the first phase of the study, the researcher identified thematic areas of modifiable risk factors of LBP that need to be explored further. In addition to these modifiable risk factors identified at the quantitative findings, other emerging themes were also incorporated in the analysis process. The main themes and subthemes were identified at the quantitative findings of the study and during the analysis process of the interviews. The data analysis process of back patients and healthcare providers are presented below.

6.2.2.1 Chronic medical illnesses

The researcher wanted to understand the association between chronic medical illnesses and the occurrence of back pain in order to develop the integrated preventative model. Back patients were asked if they had had any history of chronic medical illnesses and the healthcare providers were asked to explain how those deconditioning syndromes may predispose individuals to back pain. A majority (72.2%) of the back patients were diagnosed with at least one type of chronic medical illness. Back patient twelve mentioned her history of chronic illnesses as follows:

> *"I am a diabetic patient... I am also diagnosed with hypertension. It is more than twenty years since I know that I am hypertensive (Participant 12, Age 58)."*

From this concept, the researcher noted that the *"presence of prolonged history of chronic*

medical illnesses" and *"poor physical health"* are the contributing factors for the development of LBP. Further, he wanted to know how associated medical illnesses predisposed individuals to back pain and asked healthcare informants. Healthcare provider 6, shared his perspectives on this issue as follows:

> *"The spine holds internal organs. When there is [occurrence] of disorders on these organs, the patients may come to the clinic with a chief compliant of back pain. In addition to this, different types of cancer may also metastasise into the lumbar spine. This metastasise may lead to back pain. Further, patients who suffered from deconditioning syndromes are become physically inactive… inactive muscles will become contracted and atrophied. This will generate pain (Provider 6, Orthopaedist)."*

Some back patients mentioned that LBP has predisposed them to chronic illnesses. This is due to *"effects of pain they felt"*. As we can see from the quantitative findings, most of the patients suffered from a chronic type of back pain. This chronic pain makes them "*physically inactive"* and also, they mentioned that they developed some sort of chronic disorder due to the *"side-effects of the painkillers"* they were taking.

The researcher asked HCPs to explain how LBP may predispose individuals to chronic illnesses. On this issue, healthcare provider five expressed his views as follows:

> *"Individuals who are affected by LBP may become physically inactive... even if this is not the main risk factor, physical inactive individuals will be affected by chronic medical illnesses. This is due to that their weight may increase and the cholesterol level on their blood stream will also elevate. At that moment, they may have reduced activity. This does not support that LBP directly prone someone into deconditioning syndromes. But it is [an] indirect relationship (Provider 5, Orthopaedist)."*

The researcher also noted that there was a lack of knowledge on the association between chronic medical illnesses and the occurrence of back pain from both back patients and healthcare providers. The majority of the back patients did not know about the relationship between deconditioning syndromes and back pain. Whereas, some healthcare providers mentioned that the linkage between these two variables was not direct. The researcher preferred the explanations from the healthcare providers and provider-7- gave his response

as follows:

> "*I do not think so. Back pain does not cause diabetes. I know that most of deconditioning syndromes are occurring due to the medications taken for LBP (Provider 7, Neurologist)."*

In addition to deconditioning syndromes, back patients were asked to mention the causes of their back pain. Most of them related the causes to their own personal, social, occupational and cultural contexts. But the commonest causes of back pain stated by the back patients were *"fall down accident", "cold exposure", "prolonged sitting", "prolonged standing", "injury", "workload", "giving birth", "domestic violence", "occupation", and "unknown".* In addition to the above causes of back pain, some of the back patients mentioned that reproductive health problems had predisposed them to back pain. These were *"early marriage", "multiple pregnancies", "utilising contraceptives", "having multiple sexual partners", "lack of road and healthcare infrastructures", "giving birth in uncomfortable health facilities"* and *"negligence of the healthcare providers".*

6.2.2.2 Lifestyle factors

The researcher explored the modifiable lifestyle factors of LBP. The majority of the back patients mentioned that LBP had occurred due to a sedentary lifestyle, poor eating habits, drinking alcohol, smoking cigarettes, physical inactivity or over activity, uncomfortable sleeping materials, poor sleeping hygiene and a poor transportation system. The analysis for those variables is presented in the following subsections.

- Sedentary lifestyle

Regarding the sedentary lifestyle of back patients, the participants were asked "Do you think that your lifestyle increases the risk of you developing back pain?". The majority of the back patients have stated that their traditional lifestyle contributed to the development of their LBP. Traditional lifestyles played a critical role on the occurrence of musculoskeletal disorders.

> *"I think my traditional lifestyle prone me into back pain. The way I work and live daily life exposed me into this disorder (Participant 2, Age 46)".*

The healthcare providers were also asked "How does a sedentary lifestyle predispose

someone to back pain?" They responded that they linked this concept with poor eating habits, physical inactivity and prolonged sitting. Healthcare provider four explained her understanding as follows:

> *"Those individuals who have sedentary lifestyle are either they are in sitting position or not become active (Provider 4, Physiotherapist)".*

Some of female back patients mentioned that activities performed at home played significant roles in the occurrence of their back pain. Home based activities are very demanding and require bending, twisting or sitting in awkward postures for a longer period of time in order to complete them. The interview with female patient one went as follows:

> *"Even if females took annual leave from their working institutions, they are not getting rest at their home. They work some type of activities at their home. They might also prepare foods for annual consumption. This prone to bend, twist, or reached overhead to accomplish the tasks. I think these activities are the leading factors for the development of back pain among women (Participant 1, Age 48)."*

- Poor eating habit

The majority of the back patients mentioned that their eating habits failed to allow them to gain vital nutrients. Since they are commonly eating 'injera', which lacks essential minerals and vitamins. This is vastly due to a poor socio-economic status, whereby the types of foods they prefer to eat lack nutrition. But they understood that not getting an adequate amount of food will increase the risk for different health-related problems.

Healthcare providers were also asked "How eating habits predisposed them to be liable for back pain?". They responded that *"poor eating habits"*, *"types of foods they are commonly eating"*, *"eating position and posture"*, *"skipping meals"*, and *"ignorance about a balanced diet"* are the major contributing factors for the occurrence of back pain. Healthcare provider seven described his thoughts as follows.

> *"When you see our community, they are not eating adequate amount of foods, not able to get nutritious foods and not eating their meals regularly. You might observe them when they eat injera for weeks or months without any additional diets and also, they might skip their breakfast or lunch. This type of behaviours will affect*

their overall health status. We should have to create awareness on the effects of these behaviours. Generally, eating a balanced diet with a regular manner is vital for our body (Provider 7, Neurologist)."

- Drinking alcohol, smoking cigarettes and chewing khat

Back patients were asked about their knowledge, attitude and behaviour towards the effects of drinking, smoking and chewing khat. Most of them mentioned that participating in these types of behaviours had a direct or indirect effect on their back . Individuals who drink alcohol are more likely to suffer back injuries than those individuals who do not drink.

On the same subtheme, healthcare providers mentioned that drinking alcohol had an indirect effect on the spine. They mentioned that alcohol predisposed individuals to anorexia, food malabsorption, poor sleeping positions and an inadequate amount of sleep which are the main factors that increased their risk to having back pain. Healthcare provider four accounted her personal explanations as follows.

> *"Let me try to explain this for you about chronic alcoholic individuals who drank more than two or three bottle of beer per day. The more they drank alcohol; the more problem is happening in their gastrointestinal system. Their body cannot absorb food…, they lose appetite. Due to those reasons, they cannot build muscles. Lack of muscle building prone them into back pain because the spine lacks support from surrounding muscles (Provider 4, Physiotherapist)."*

Additionally, a back patient who smoked mentioned that the chemicals that are found in cigarettes might weaken his discs and predispose him to back pain. He showed a positive attitude towards cutting down on smoking cigarettes, but he acknowledged difficulty in stopping. Likewise, some healthcare providers mentioned that smoking might increase the risk of getting back pain through diminishing bone density. The researcher noted that there was a lack of awareness about the effects of alcohol and smoking by some of the participants. Back patient eleven described his understanding about the risks of drinking alcohol and smoking as follows.

> *"I do not know in detail if smoking and drinking alcohol might vulnerable to LBP (Participant 11, Age 33)."*

Chewing khat increased the risk of individuals getting LBP indirectly. Individuals who chew khat might sit for a longer period of time in order to finish the ceremony. This will damage their spine and promote the occurrence of LBP.

- Poor weight control

Controlling body weight could prevent different health problems. But the majority of the back patients were not able to maintain their ideal body weight due to lack of knowledge of weight reducing measures. Similarly, most back patients stated that being under and/or overweight is the major contributing factor for the development of back pain. Being underweight leads to a weak body physique and lack of spinal stability, whereas, being overweight might predispose one to suffer with back pain through direct or indirect effects on the spine. The majority of the back patients were aware of the benefits of maintaining an ideal body weight. This idea is supported by back patient two and his view is stated as follows:

> *"Controlling body weight has voluminous importance for our overall health. If I am able to control my weight, I could reduce the load that exerted on my back. Second, I can walk freely without any stress. Third, I will be more active and prevent occurrence of other associated illnesses. Finally, I will be flexible and perform all tasks that I want to perform easily (Participant 2, Age 46)."*

The healthcare providers were also asked to describe their explanation on how poor ideal body weight predisposed individuals to have back pain. They stated that poor ideal body weight might be responsible. Healthcare provider five stated his views as below:

> *"The bones and joints have capacity to hold the maximum body weight. When the body weight is over the capacity of those structures, there will be compression force excreted on the spine. The compression force is high, and they are prone to degenerative diseases. Additionally, overweight individuals are unable to move easily. They do have limitations of movements. Similarly, those individuals who are underweight will prone to back pain because they are unable to get necessary minerals and vitamins that are responsible for cell growth, bone formation and other structure formations. There cells lack protein, lipids and carbohydrate for*

regeneration process. They are at higher risk for LBP (Provider 5, Orthopaedist)."

- Exercise programme

The collective type of exercise programmes mentioned by the interviewees were *"walking longer distances"*, *"running in nearby streets"*, *"performing intense or vigorous exercises"*, *"doing exercises at home"*, *"attending sport classes at high school or college"*, and *"participating in a mass sport event"*. The benefits of attending any type of exercise programme may help *"improve blood and oxygen circulation"*, *"remove waste products"*, *"mend thinking ability"*, *"reduce stress and anxiety"*, *"decrease pain level"*, *"create good perceptions towards self"*, *"avoid secondary complications of other illnesses"*, and *"protect from chronic medical illnesses"*.

Some interviewees mentioned that any type of exercise programmes not guided by skilled professionals could have a negative impact on our health. Back patient one shared her attitudes towards this issue as follows:

> *"There are some careless people who are not interested to follow the orders provided by skilled professionals. These individuals are not giving attention for how to do the exercises, for how long and at what time it must be performed. If we can follow the orders and steps that are prescribed from professionals, we could prevent occurrence of back pain and some other chronic medical illnesses (Participant 1, Age 48)."*

The interviewee seven gave reasons why following skilled professionals have benefits as follows:

> *"Each and every individual has his /her own capacity, ability and optimal level. If they will try to perform any exercise without a proper professional guidance, they will damage their body because exercises they are performing may not safe for them. They are doing it in a wrong posture, and they may also lift weights in deviated posture. Even if they are interested to walk, they should have to know their optimal distance because shorter or longer distance have no any extra benefit. There should have a stated*

minimum and maximum limits for all age, sex, and ethnic groups. This will have 'prestigious importance' than walking for more or less than half an hour. Therefore, every individual should follow steps given by professionals to prevent incidence of injuries (Participant 7, Age 43)."

Some informants recommended that an exercise programme should be accompanied by eating a nutritious diet. Back patient-9 expressed his point of view regarding this question as follows:

"… it will have extra benefit if it is performed together with eating a good meal. You should have to consume what you lost during exercise session. You should have to eat enough amount of food. This will replace the number of calories you burnt during the exercise programme. When you spent too much energy on your work and unable to get foods with adequate nutrients, you will be susceptible to back pain (Participant 9, Age 47)."

Healthcare providers were asked if attending any type of exercise programme had benefits for our overall well-being. They mentioned that exercise has both a mental and physical effect on our body. If it is not done with great care, an injury may occur. It is mandatory to perform exercises within one's optimal level. Whereas, being inactive through most of your life might make you more susceptible different type of disorders. Thus, exercise programmes can be used as both a preventive and treatment strategy for LBP.

- Type of mattress and poor sleeping habit

Regarding selecting sleeping mattresses in the study area, the respondents mentioned that choosing the correct mattress is important in order to sleep comfortably without discomfort. They recommended using a firm mattress because it is important *"to maintain the normal curvature of the spine"*. Otherwise, there will be some *"sort of deviation from the usual alignment"* and will predispose individuals to have back pain. Back patient two described his practises on the issues as follows:

"There are different types of sleeping materials in our country. These also varies from rural to urban areas. When we went to the countryside, they are sleeping on the floor by putting leaves, animal skins and some other traditional mattresses.

Whereas, in our city, most of the communities are using mattress as a primary choice of sleeping material. So, it is vital to choose a mattress used to sleep because each and every mattress has its own benefits and/or side-effects. First, if you have a suitable mattress, you can sleep on it in any comfortable position. Second, when you have a choice, you can sleep on it without any symptoms. Otherwise, if you do not sleep on a proper mattress, you might have forced to sleep on it without any comfort. As you know, there are individuals who are sleeping on the street, table, chair or something else, which is not convenient and suitable for them. Sleeping on such materials in a twisted position is very traumatic (Participant 2, Age 46)."

The healthcare providers were also asked to share their thoughts regarding the choice of mattresses and its association with the occurrence of back pain. Most of them stated that it was important to select a mattress that was not too soft or too hard in order to prevent injury. Healthcare provider four answered the question "What type of sleeping material do you advise for healthier individuals to prevent the occurrence of LBP?"

"I advised the bonded type of mattress, because it is not too soft or hard... there must be some soft spongy that could accommodate our soft tissues. That is a better type of mattress for all individuals. But the extra bonded mattress is one risk factor for the development of LBP. If you advised me to sleep on such type of hard mattress, this will injure my soft tissues. Most professionals are only thinking about the spine. They forget soft tissues. We should have to protect the soft tissues. This structures are protecting the spine from any injury. If you slept in a hard surface, you will feel pain. Generally, it is advisable to sleep on a mattress that is not too soft or hard (Provider 4, Physiotherapist)."

The researcher noted that some of the interviewees had *"poor knowledge on selection of a mattress"* and the healthcare professionals were *"not advising them about the importance of choosing the right mattress"*.

Some back patients mentioned that napping in uncomfortable positions or places, waking up during the night, sleeping during the day and disturbances whilst asleep were the main factors that predisposed individuals into suffering discomfort with their backs. Additionally,

healthcare providers also described that poor sleeping habits led to different disorders believing LBP could also cause sleeping disorders. Due to an imbalance between the production of hormones and the repair of damaged tissue. A lack of sleep means that tissue damage does not repair, and the problem will further be aggravated and vice versa. So, it is vital to get an adequate amount of sleep of at least eight hours.

- Poor transportation system

Preferences regarding the mode of transportation used depended largely on access, availability and affordability. The majority of the back patients' preferences were taxis, bus, public bus services, walking and a three wheeled vehicle or Bajaj. They shared their experiences to the researcher regarding the problems they encountered during selecting their mode of transport and the occurrence of musculoskeletal disorders. These problems were linked with the vehicles (old or new, manual or automatic), the condition of the road, the behaviour of the drivers and passengers and the length of the journey.

The majority of the healthcare providers mentioned that the poor transportation system is a direct risk factor to the occurrence of LBP. They however failed to mention which type of transportation is more advisable for a relatively healthier individual. Back pain might be related to incidents of prolonged standing, poor sitting posture, overcrowding, etc. They advised avoiding crowded transportation means, not to sit in a seat that is not designed to be sat in and to avoid standing on the bus or train. The fifth healthcare provider shares his thoughts on this matter as follows:

> *"… because your siting position matters. But when we see our taxis and buses, they have no enough [siting] space. They also forced to sit at least three individuals on two sits. They are not able to sit in upright posture. They also twist their legs into other side. When this happens for a longer period of time, it will prone to LBP (Provider 5, Orthopaedist)."*

6.2.2.3 Work-related factors

The majority of the back patients mentioned that their occupation, prolonged sitting and standing, unsuitable working environment, deviated working posture, workload and job dissatisfaction were the major work-related factors that played a significant role in the

occurrence of back pain. The effects of work may originate from its nature, which comprises of drivers, managers, housewife's, and so on. All manner of jobs required either prolonged sitting or standing, bending, twisting or some other awkward body posture. This exposes workers to the occurrence of repetitive micro trauma on the spine. Healthcare provider one expressed his thoughts on this issue as follows:

> *"Work-related factors are not predisposing individuals into LBP within a short period of time. They must occur for repetitive manner in a longer duration. If there are incidents like accident and/or trauma, there will be development of LBP within a short period of time. Otherwise, this type of disorder occurred slowly. Most of the time, repetitive micro traumas are communal factors for the incidence of LBP in the working sector of our country... when the stress level at the working environment increases, the occurrence of pain also increases (Provider 1, Physiotherapist)."*

A summary of the work-related factors that had both a direct and indirect effect on the overall well-being of individuals is presented in figure 6.5 below.

- There are personal factors that exposed them to suffer with LBP. These were *"being tense and anxious", "being workaholics", "feeling tired", "prolonged sitting and standing", "lifting heavy loads", "working in a crippled position", "pulling, pushing objects", "picking up materials or objects", "bending and twisting for longer periods of time",* and *"arranging, separating, cutting and packing of materials".*

- The *"nature of occupation",* presence of *"workload", "unsuitable working environment", "overcrowding in the working area", "unconducive working environment",* and *"job dissatisfaction"* were mentioned as a factor for the occurrence of LBP from the occupational point of view.

- From the employers' perspectives, the researcher noticed that back patients were unable to get *"support from their colleagues, supervisors and the recruiting body".* They were also assigned their working stations based on the preference of the employer and not according to *"personal interest and skills",* which did not consider the employees' educational background and job description.

- All of the above stated risky working environments and *"lack of awareness and*

recognition about back pain as a priority disorder by the higher governing bodies and policy makers" , further promoting the effects of LBP.

- All the above explained modifiable factors will assist the researcher to develop the integrated preventative model for the prevention of LBP.
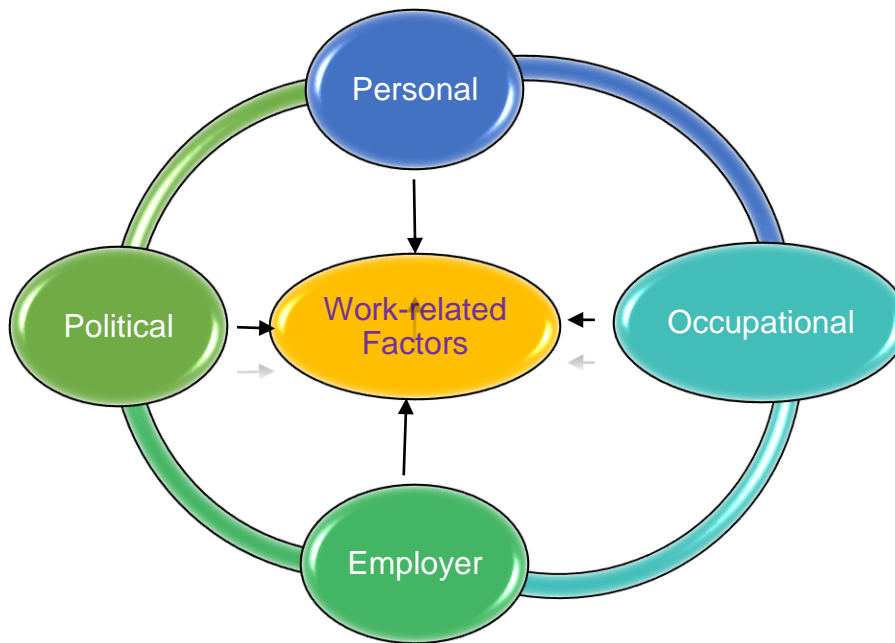
Figure 6.5 Work-related factors of low back pain

6.2.2.4 Psychosocial factors

- Life expectations

To have insight on the association between life expectations and the occurrence of LBP, the researcher asked back patients if they were living life as they wished. The majority of the back patients mentioned that most Ethiopians did not live life as they wanted, stating it was because they lived in the poorest country in the World. One back patient *"no, I am not living as I want to live because there are things that I am not able to fulfil. These things make me to worry a lot"*.

Healthcare providers also mentioned that individuals facing life challenges predisposed them to work harder sometimes causing sudden traumatic back incidents.

- Lack of time for relaxation

The majority of back patients reported that having adequate time for relaxation with friends and family members had different benefits. It made them "to feel happy" (psychological benefits), "to reduce stress and depression", "to improve social bond" (social benefits), "to create opportunities to discuss the risk factors and lived-experiences of LBP" and they could also "prevent the occurrence of chronic medical illnesses by sharing ideas with friends". This will have additional benefits if supported by family members who have better understanding of the importance of relaxation. Some back patients stated that they did not have time to relax. However, a lack of recreation and time with family and friends may lead to different types of health-related disorders such as stress, depression or musculoskeletal disorders.

- Lack of family support

Family support has dual benefits for back patients. Firstly, family advise the sufferers to take precautionary measures in order to prevent further injury and secondly, they help them through painful events. Some back patients stated that family members advised them not to carry out tasks at home, as they believed they would feel better if they were restricted from doing indoor and outdoor activities. Lack of movement and reduced cardiopulmonary endurance leads to a worsening of the condition and the development of chronic medical illnesses like cholesterol, diabetes and hypertension. However, the majority of the healthcare providers advised all individuals to have an adequate time for relaxation and to seek support from family and friends, helping in the prevention of LBP. Thus, in order to maintain health promoting behaviours, it is vital to be aware about the benefits of relaxation and family support.

- Stress and depression

According to back patient views, psychological disorders may also be a cause of back pain. They stated that when they became stressed, they were unable to eat, sleep, concentrate on their work, and socialise. Thus, trying to reduce stress is important to prevent the occurrence of musculoskeletal disorders. Back patient seven expressed his views on the issue as follows:

> *"I thought that angriness, stress, wearisomeness and depression are the causative factors for back pain. I am trying to reduce those events with different mechanisms... on the other hand, back pain also prone someone into stress and*

depression. If your family does not understand this problem, you might force to commit suicide because you are not able to sleep and incapable to become what you want to be. These all will prone you to develop psychological disorders (Participant 7, Age 43)."

This is supported by the viewpoints of some healthcare providers, who said that stress increases the susceptibility to musculoskeletal disorders and there are some other experts who state that pain might also increase the occurrence of stress and/or depression. During stressful events, hormones are produced, and these chemicals may have a negative effect on the body and manifest into different type of diseases. Everything is related and has a cumulative effect on the spine.

6.2.2.5 Socio-cultural factors

The researcher explored the modifiable socio-cultural risk factors of LBP including participating in religious ceremonies, overcrowding, domestic violence, traditional beliefs and compensation claims. These variables are presented in the following subthemes accordingly:

- Attending religious ceremonies

The researcher wanted to explore the influences of attending religious ceremonies on the development of LBP from the back patients' and healthcare providers' perspectives. The majority of the informants were orthodox followers and almost all of them went to church once a week. Most of them believed that the occurrence of back pain had no direct relationship with participating in any religion ceremonies. They believed that individuals with "*a strong religious belief are less likely to be affected by any illnesses*". However, some informants mentioned that *"sitting and standing for longer hours"*, *"praying in an awkward posture" and "fasting for longer hours"* were the contributing factors for the occurrence of back pain.

Some healthcare informants also mentioned that participating in religious gatherings had a dual purpose. Firstly, it might be used to prevent the occurrence of back pain through spiritual healing effects, and secondly, it could be viewed as a treatment strategy for sufferers. They stated that the participants might be exposed to overcrowding, incidents of minor injuries,

prolonged standing and sitting, worshiping in an unsuitable place, and so on. These variables are the risk factors for LBP.

- Overcrowding

Some back patients mentioned that they lived in overcrowded areas. They stated that congested living areas made them liable to "*observing the crowd"*, "s*tress", "lack of freedom", "unable to take break", and "bent into awkward body postures and movement".* Healthcare providers also added similar concepts about why relatively healthier individuals who live in a congested area might have an increased risk to back pain largely due to a lack of available space and therefore freedom of movement. It could be viewed that where one lives causes back pain through direct or indirect physical, psychological and mental health problems. Healthcare provider eight described his experiences on this issue as follows:

> *"Individuals who are living in an area which have overcrowding might not get chance to observe individuals having fun and playing with their mates freely. Then he or she will be unable to move around the crowd and became stressed. There will cause some sort of deviated body movement inside the crowds. I think this is how back pain may develop due to living in an overcrowded area (Provider 8, Neurosurgeon)."*

- Domestic violence

Out of eighteen interviewed back patients, five (5) individuals reported that they encountered domestic violence. Such types of familial fighting may create direct injury to the victim or lead to stress. Here, LBP might occur due to two reasons; firstly, it might occur due to the direct physical violence and secondly, it could develop indirectly from stress or depression following episodes of domestic violence. Stopping domestic violence is important for the well-being of all family members. Back patient five expressed her views on the issue as follows:

> *"When you have such type of problem with your family, your healthy will be damaged. Your brain will be affected… you do not know what you are doing… at that moment your cells are getting hurt… maddening is not advised for everyone (Participant 5, Age 78)."*

Some healthcare providers revealed that domestic violence could increase the risk to both

parties into suffering with psychological and physical disorders. They advised all parties to take action in order to reduce the occurrence of any type of violence.

- Traditional beliefs

Most of the back patients believed that their back pain occurred due to traditional beliefs that are common in the community. These stated beliefs were *"incantations (the use of words as a magic spell)", "power of ancestors", "evil eyes", "devil spirit", "individuals with strong eyes" "cold exposure", "touching or crossing something awful", "mystic acts done from someone else", "wukabi (a genetic traditional belief)",* and *"metet (enemy may do a magic with your name and your mother's name)".* Back patient seven described his opinions as below:

> *"For example, I lived in two cultural different areas. The people from Wolega believed that back pain is [occurred] due to a 'punishment from God'... while, individuals lived in the area where I am living now, Mizan Tepi, is whispering that back pain is arisen due to a 'mystic act' from someone else who wants you to become disabled... this is what their aphorism all about (Participant 7, Age 43)."*

However, some other back patients and healthcare providers explained that these types of traditional beliefs are *"false perceptions and imaginations created by the society"* and its contribution on the development of back pain *"depends on the level of your understandings".* Back patient eleven described his thoughts and experiences on the issue as follows:

> *"No, this is their perception. Traditional belief does not have any association with [the occurrence of] back pain. Even the development of my back pain did not relate with evil [eyes]. It occurred after I suffered a fall down accident (Participant 11, Age 33)."*

- Compensation claims

Most healthcare providers mentioned that LBP is falsely used by some members of the working community to claim compensation. It can be also used by a family members in order to gain attention. On the same issues, healthcare provider eleven replicated his opinions, experiences, and thoughts as follows:

> *"There are different types of pain expression modes available in our country. Some people used this compliant to get compensations in terms of monetary*

or nonmonetary form. Further, they take rest by using it as a chief complaint falsely to make themselves away from their job. This is a norm in certain governmental or nongovernmental organisations. They took sick leave and stayed at their home without pain (Provider 7, Neurologist)."

6.2.2.6 Back ergonomics

In order to prevent the occurrence of LBP, understanding correct back ergonomics is essential. The majority of the back patients mentioned that they did not know how to sit in an upright posture and how to lift loads using precautionary measures. This occurs due to a lack of awareness programmes on ergonomics among the community. The healthcare providers did not provide this preventative method for the community as a whole. They focused only on treating diseased individuals. This creates a gap in promoting the benefits of back ergonomics to the most productive group of the community. The traditional sitting, lifting and working postures predisposes them into back pain. Therefore, the healthcare providers should teach the community utilising a mass campaign programme using different outlet methods on back ergonomics, risk factors of LBP and the most appropriate prevention methods.

6.2.2.7 Health promoting and jeopardising behaviours

- *Health promoting behaviours*

Most respondents mentioned that *"there are no good behaviours"* because it varies from individual to individual. So, health promoting behaviours should be designed from every different individuals' perspective. Healthcare providers were asked, "From your clinical experiences, what are the health promoting behaviours used to prevent the occurrence of LBP?" All of them mentioned participating in any type of physical activity as having been the most important health promoting behaviour, they used to prevent the incidence of LBP. The answers were presented in figure 6.6 below.
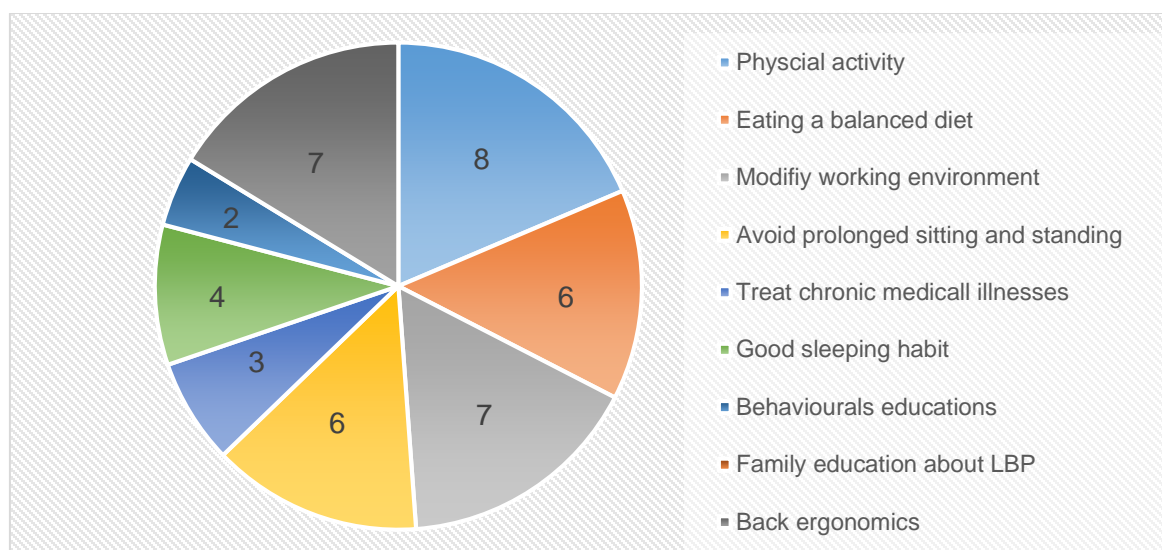
Figure 6.6 Health promoting behaviours (n=8)

Those health promoting behaviours in the diagram above, could be used as both preventative strategies for the occurrence of back pain and could also be practiced as treatment strategies for individuals diagnosed with backache. Healthcare provider six mentioned the following point in this statement as follows:

> *"Yes, they can be used as prevention methods. In addition to this, they could be used as treatment strategies for individuals who has been suffered from back pain (provider 6, Orthopaedist)."*

- *Health jeopardising behaviours*

According to the explanations of the back patients and healthcare providers, physical inactivity, poor eating habits, awkward working posture and sleeping in unsuitable places were listed as bad behaviours. The majority of the back patients also mentioned that a "*lack of sleep*", "*poor eating habit*", "*poor sleeping hygiene*" and "*lack of knowledge on how to maintain ideal body weight*" are health jeopardising behaviours. Additionally, some back patients perceived that LBP is "*an incurable disorder*" and the available "*prevention methods are not effective*". They also stated that there is "*lack of awareness by the community*" and "*LBP is not recognised as a priority disease*" by the policy makers.

The experts were also asked to reflect on how behaviour promotes or jeopardises health promotion activities. They stated that there are no good or bad behaviours in our country.

Everything should be designed by considering the optimal level of each and every individual. They concluded their responses by saying that *"everything is learning"*. If we adapt behaviours which can promote our well-being, we will stay longer without any pain. But if we are become careless and doing things irresponsibly, we will prone into back pain. On this issue, healthcare provider two reflects his thoughts as follows:

> *"...behaviour is a dynamic process. Those people who are practicing good behaviours are in a better health status than those persons who have maladapted actions (Provider 2, Neurologist)."*

- *Influence of culture on the health promoting and jeopardising behaviours*

Culture influences all types of behaviours in a positive or negative way. Ethiopia is a multi-cultural nation which has more than 80 ethnic group. This diverse culture will have direct or indirect impact on the health promoting and the jeopardising behaviours as mentioned above. Understanding each culture and its impacts on the community is essential in order to design a preventative model. Majority of the back patients were from multi-ethnic background and expressed their lived-experiences based on their own explanatory methods. They stated that good or bad behaviours are followed based on the cultural origin of the actors. Thus, culture influences like the way we eat, attend any type of exercise programme, preference of transportation mode, following medical orders, and so on. On this issue, the eighth healthcare provider presented his views as below:

> *"Culture is a wider concept. It includes lifestyle, diet, exercise and stress. What we called lifestyle is sedentary lifestyle... this also further escalated by the type of food commonly eaten... the chemicals that are found in the food we ate will have acute effect on the neurotransmitters. Whereas, there will be also chronic structural change known as maladaptation. This wrong adaptation will affect the physiology of our body systems… learning prone individuals into addictions (Provider 8, Neurosurgeon)."*

Physical, cultural and social environments have a huge influence on the way to follow a health promoting behaviour or health jeopardising behaviours. These health jeopardising behaviours are determinants that influence the development of LBP in healthier individuals. However, health promoting behaviours are essential to tackle the occurrence of LBP.

Therefore, different types of health promoting, and health jeopardising behaviours are presented earlier in different sections.

The relationship between bio-medical and culture based modifiable risk factors of LBP and health promoting and jeopardising behaviours for the development of LBP is presented in table 6.3 below.

Table 6.3 The link between modifiable factors and health promoting and jeopardising behaviours in Addis Ababa.

Modifiable risk factors		Health promoting behaviours	Health jeopardising behaviours
Chronic medical illnesses		*Prevent and/or treat deconditioning syndromes.*	*Deconditioning disorders are inevitable for all human beings.*
Lifestyle factors	Sedentary lifestyle	*My lifestyle is traditional, which needs modifications.*	*I do not worry a lot for my life.*
	Eating habit	*I am not eating fatty foods and drinking energy drinks.*	*I love sweet foods like candy, chocolate, etc.*
	Ideal body weight	*I am trying to maintain my ideal body weight.*	*I do not care about my weight.*
	Drinking alcohol	*I am not drinking alcohol.*	*Drinking does not have any risk for my well-being.*
	Smoking cigarette	*I want to stop smoking cigarette.*	*I got relief from stress when I smoked cigarette.*
	Physical activity	*I am participating in physical activity programme.*	*I am not doing any type of exercise due to lack of time.*
	Sleeping mattress	*I am sleeping on an extra-bonded mattress.*	*I am sleeping on a spongy mattress.*
	Transportation system	*Sitting/standing pose in the car should be in a proper way.*	*Travelling by standing/sitting as an extra individual on the vehicle.*
Work-related factors	Sitting & standing	*I advise individuals to avoid prolonged sitting and standing.*	*I do not have any choice; it is the nature of my job.*
	Job dissatisfaction	*It is better to make interactive working areas for all staffs.*	*The working area is bad due to the country system.*
	Working environment	*It is better to change working stations frequently.*	*The overall layout of my office is not comfortable.*
Psychosocial Factors	Time for relaxation	*I am getting out with my friends and families.*	*I do not have time to go out and having fun with families/friends.*
	Family support	*I am living with my family members.*	*I am living alone because my families are not living in the city.*
	Social gatherings	*I have a good social bond with my neighbours.*	*I am not interested to participate in any social gatherings.*
	Stress & depression	*I am trying to reduce stress with different mechanisms.*	*I do not know the comping mechanisms.*
Cultural factors	Life expectations	*I am enjoying life as much as I can.*	*I am not living life as I wished.*
	Traditional beliefs	*LBP does not have a link with our traditional beliefs.*	*I thought all diseases are occurred due to a sprit from devil.*
Back ergonomics	Sitting posture	*I am following ergonomics recommendations.*	*I focused only on doing tasks & not remember my sitting posture.*
	Lifting techniques	*I should have to lower down slowly from my knees.*	*I did not remember how should I lift loads with precautions.*

6.2.2.8 The impacts of low back pain
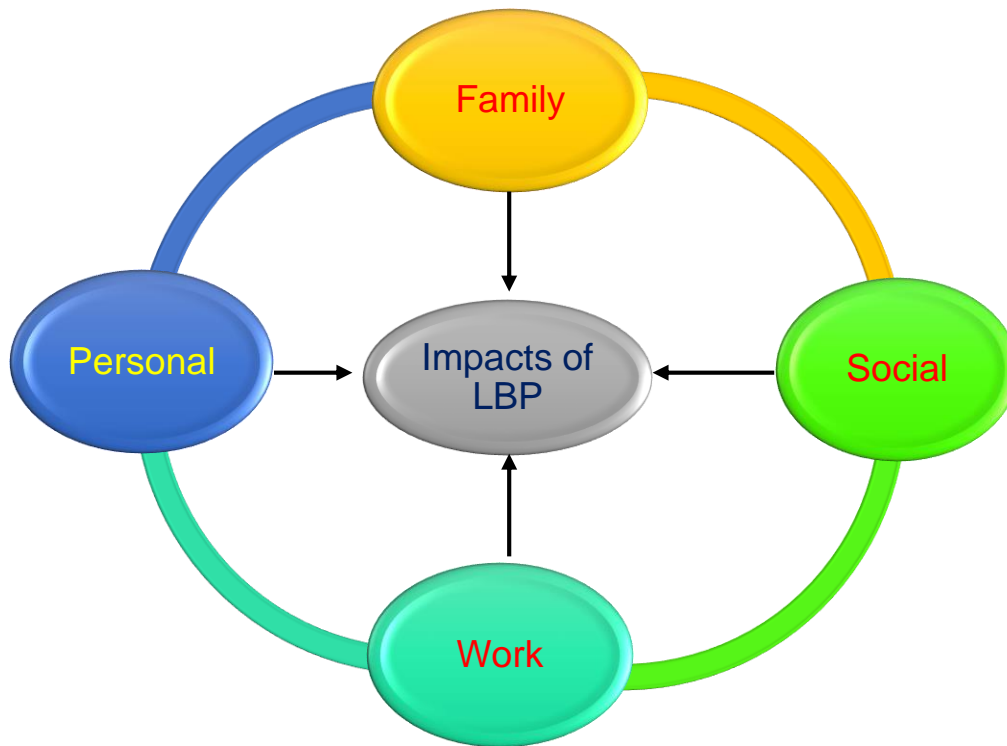
Figure 6.7 The impacts of low back pain

According to figure 6.7 above, the impact of LBP is significant. The back patients mentioned its effect at personal, family, work and social levels. Among the impacts of LBP at a personal level; pain, restricted daily activities, discomfort during sexual intercourse, erectile dysfunction, insomnia, stress, depression, attending medical follow-ups at different health facilities and taking high dose opioids were mentioned by the back patients. They also revealed that taking painkillers for a longer period of time had predisposed them into sleeping for longer durations, taking rest, feeling lethargic and reducing activities. The cumulative effect of these factors predisposed them into obesity and early retirement from their career. They also described that some of the impacts of LBP at a family level were unable to perform homemade activities, unable to take care of children's, dependency to their family members, and losing their lover one or even divorce. They described work level impacts of LBP, such as: back pain prevents from doing any tasks, asking colleagues to perform their duties, disability compensations, resigning from job, reduced income level due to losing a job, and so on. Furthermore, they described community level impacts of LBP, such as: back pain

prevents attending from religious ceremonies and social gatherings, which predisposed suffers to stigmatised (*'self-stigma'*) themselves from the society.

According to back patient one experiences, LBP makes her to feel incompetent with other healthier individuals and also it changed her perceptions towards herself. Her verbatim response is presented as follows:

> *"It is a huge problem. You cannot put it into simple words… it is just the hardest disorder more than you imagine. It does not allow you to become a competent person. I perceived that I am someone who does not look like a healthier individual. It makes me to feel unequal with other individuals because my real smile is covered with the feeling of pain. The pain makes me to feel depressed and I thought that I lost something inside my body (Participant 1, Age 48)."*

Majority of the informants also supported this idea and argued that interferences of LBP on the daily life at different levels is more than anything else. It interferes with all types of Activities of Daily Living (ADL). Those activity restrictions increase the risk of individuals developing personal, familial, social and economic problems as mentioned above.

- Definition of low back pain

The healthcare providers had different understandings towards the definition of back pain. As mentioned above, they were some healthcare providers who defines LBP as *"a disorder that occurs in the lower spine between the gluteal folds and the lower margins of the rib"*, but others defined it as *"a syndrome that occurred starting from our neck up to lower margin of the spine"*. The former group described back pain in a more scientific way and they probably sharing knowledge, showing possible preventive options and treatment strategies for their clients. The latter group described in a more general and nonspecific way and they may create more additional problems on the sufferers or could not able to show appropriate preventive methods.

6.3 THE KEY FINDINGS OF THE QUALITATIVE PHASE

The findings from the interviews offered an extensive culture dependent modifiable risk factors categorised as bio-medical and culture based risk factors of LBP. However, some variables might fall on both bio-medical and culture-based risk factors, but the researcher preferred to present these as depicted above. This classification is based on the literature obtained during the literature search process and the comments offered by healthcare providers during key in-depth interview aspect. Based on this, the key findings of the qualitative phases of the study is presented in the following table. These risk factors are influenced by the culture of the society in a positive or negative way. Therefore, the factors are also modifiable at any time when the culture of the community is changed and/or modified.

Table 6.4 Summary of the pertinent findings of this phase of the study

Bio-medical factors	Cultural factors
o Taking contraceptives o Menstrual disorders o Deconditioning syndromes o Fall down accident o Poor sleeping habit o Stress o Depression o Unsuitable working environment o Prolonged sitting o Prolonged standing o Workload o Poor knowledge on back ergonomics o Lifting heavy loads o Prolonged bending o Awkward body posture	o Sedentary lifestyle o Poor eating habit o Poor weight control o Physical inactivity o Drinking alcohol o Smoking cigarette o Chewing khat o Poor transportation system o Uncomfortable mattress/bed o Overwhelming life expectations o Overcrowding o Homemade activities o Attending religious ceremonies o Domestic violence o Traditional beliefs o Lack of family support o Lack of relaxation time o Compensation claims

6.4 SUMMARY

This chapter presented the qualitative findings of the study. The phase usefully increased the depth of findings from the first phase of the study by exploring the modifiable risk factors of LBP. These factors were used to give insights for the researcher. Furthermore, the influence of culture on the development of health promoting and jeopardising behaviours were also explored from the back patients and healthcare providers' perspectives and presented on the study. Following on from this, the next chapter will integrate the pertinent findings from the two phases of the study and finally, a culturally sensitive integrated preventative model will be developed from the key bio-medical and culture based modifiable risk factors of LBP for the prevention of its occurrence among healthier individuals in Addis Ababa, Ethiopia.

CHAPTER 7

DATA INTERPRETATIONS, DISCUSSIONS AND MODEL DEVELOPMENT

7.1 INTRODUCTION

The findings of mixed methods research should be integrated somewhere before the final conclusions can be presented, otherwise it could not be mixed methods research (Creswell & Clark 2015:389). As indicated earlier, the researcher has planned to blend the results of the two datasets within chapter seven. Therefore, in this section, the researcher integrates pertinent findings of the quantitative and qualitative phases and discusses them to draw a composite and valid conclusion on the bio-medical and culture based modifiable risk factors of LBP. It offers additional insights on the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours as they relate to the development of LBP from two participant groups, that is, those with back pain who attended follow up clinics and secondly, the healthcare providers who provided health services for the back patients. The pertinent findings from the two phases of the study were utilised for the development of a culturally sensitive preventative model for the prevention of LBP in the study area.

7.2 SYNTHESIS OF FINDINGS FROM THE SURVEY AND INTERVIEWS

The results of quantitative and qualitative phases were presented separately in the previous chapters (Chapter 5 and 6 respectively). At this integration phase of the study, the composite findings provide comprehensive and depth insights into the bio-medical and culture based modifiable risk factors of LBP. Thus, the integration of the survey and interviews highlights the issues that relate to the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours on the development of LBP. Pertinent and important findings of the first and second phases are summarised in table 7.1 below.

Table 7.1 Summary of findings of the quantitative and qualitative methods using different data collection tools

QUANTITATIVE PHASE	QUALITATIVE PHASE	
Survey questionnaire	In-depth interviews with back patients	KI interviews with healthcare providers
• Chi square test was employed to assess association between selected demographic profiles and risk factors of LBP and the following findings were obtained: 1. There was a high correlation between the respondent's gender and exercise habit ((χ^2(1,N=170) = 9.086, P = 0.003, Cramer's V= 0.231) and OR = 2.96, 95% CI (1.44, 6.096)). Indicating that female back patients were 3 times more likely to be not interested to participate in exercise than male patients. 2. There was a statistical significance difference between age of the respondents and transportation method (χ^2(1, N=170) = 22.052, P = 0.037, Cramer's V= 0.208). This implies that younger generations preferred taxis and bus as a convenient mode of transport system. 3. There was a highest correlation between the educational level with choosing mattress (χ^2(1, N=168) = 34.181, P = 0.000, Cramer's V= 0.319) and transportation method (χ^2(1, N=168) = 21.642, P = 0.042, Cramer's V= 0.207). This revealed that individuals who attended high school and above were more likely to select appropriate mattress for sleeping and taxi or bus to travel. 4. Age of respondents showed statistical correlation with job satisfaction (χ^2(1, N=168) = 20.059, P = 0.003,	• Thirteen (13) out of 18 informants were diagnosed with at least one type of deconditioning syndromes. • LBP had prone them into chronic medical illnesses and vice versa. • Sedentary lifestyle was prone them into LBP. • Majority of the back patients had irregular eating habit. • Poor eating habit, i.e. under nutrition and over nutrition were mentioned as a risk factors of LBP. • They did not know how to maintain ideal body weight. • Most of them indicated that they are an occasional drinker of alcohol. • After drinking alcohol, direct and indirect injuries might happen on the back. • Some participants perceived that smoking cigarette does not have	• Chronic medical illnesses are both a causative factors and also can be occurred after occurrence of LBP. • Chronically debilitated individuals are become physically inactive. • Contraceptives reduced oestrogen level and bone density on females' body that causes ligament laxity and osteoporosis. • Lack of activity prone into different health-related problems. • Eating in poor positions, lack of vital nutrients and over nutrition are health jeopardising behaviours. • Drinking alcohol reduced appetite, reduced food absorptions and also prone individuals to sleep in a faulty posture, fall down accident and fighting injuries. • Being overweight creates load on the spinal structures.

QUANTITATIVE PHASE	QUALITATIVE PHASE	
Cramer's V= 0.244) and movement patterns (χ^2(1, N=170) = 17.645, P = 0.001, Cramer's V= 0.322). Indicating older individuals were not satisfied with their job and younger individuals were prone into different types of movement patterns. 5. There was a borderline association between age of the respondents with prolonged sitting (χ^2(1, N=170) = 7.620, P = 0.045, Cramer's V= 0.212). This indicates that as age rises, they might sit for more than an hour. 6. The educational level of the respondents had showed statistical significant with job satisfaction (χ^2(1, N=166) = 30.668, P < 0.001, Cramer's V= 0.304), workload (χ^2(1, N=168) = 20.749, P = 0.002, Cramer's V = 0.249), and working environment (χ^2(1, N=168) = 17.815, P = 0.007, Cramer's V= 0.230). This infers that individuals who attended above high school indicated that they faced workload and their working environment was unsuitable and dissatisfied with their job. 7. Ethnicity of the respondents had showed a statistical association with job satisfaction (χ^2(1, N=168) = 16.496, P = 0.036, Cramer's V= 0.222) and movement patterns (χ^2(1, N =170) = 9.704, P = 0.046, Cramer's V = 0.239). 8. There was statistical association between type of house with prolonged sitting (χ^2(1, N=170) = 4.996, P = 0.025, Cramer's V = 0.171) and OD= 0.438, 95% CI (0.211, 0.912)), prolonged standing (χ^2(1, N= 170) = 4.537, P = 0.033, Cramer's V = 0.163) and OR= 1.938, 95% CI (1.051, 3.572)) and movement patterns (χ^2(1, N=170) = 7.921, P = 0.005, 0.216, Cramer's V = 0.216) and OR= 2.455, 95% CI (1.306, 4.615)).	any importance, but they were unable to stop smoking. • They perceived that chewing khat promote socialisation and discuss ideas freely. • Chewing khat prone into prolonged sitting and inactivity. • Majority of them did not participate in regular exercise programme. • Some of the back patients understood the importance of selecting sleeping materials. • Lack of adequate sleep prone into different health-related disorders. • The transportation system is poor in the study area and prone individuals into psychological and physical traumas. • There was lack of knowledge on the effects of prolonged sitting, prolonged standing and faulty postures. • They focused only on the job they were doing rather than thinking about body posture. • Most of the back patients who were employed in formal sectors were dissatisfied with their job and prone into different problems. • The working environment of the country is not safe for the workers.	• Smoker's body lacks adequate amount of oxygen and nutrients. • Physical inactivity predisposed into prolonged sitting and standing, whereas, being overactive prone into sport-related injuries. • Participating in physical activity promotes overall well-being. • Getting adequate sleep and taking rest are health promoting behaviours. • Sleeping on the uncomfortable mattress is prone into postural problems. • Congested and crowded transportation systems are prone into different health-related problems. • Dissatisfied with job prone into psychological and physical disorders. • Presence of workload in the working environment predisposed into overuse syndromes. • Being unhappy with life prone into stress and depression. • Stressed individuals are prone into musculoskeletal disorders.

QUANTITATIVE PHASE	QUALITATIVE PHASE	

9. There was also high correlation between occupation of the respondents and patterns of movement (χ^2(1, N=169) = 24.596, P = 0.001, Cramer's V= 0.381)). Indicated individuals who were employed in a formal sector were prone into awkward movements.
10. There was correlation between age of the respondents and time for relaxation (χ^2(1, N=170) = 10.106, P= 0.018, Cramer's V= 0.244)), religion with attending social gathering (χ^2(1, N=169) = 9.970, p=0.019, Cramer's V = 0.243)), ethnicity and participating in social life (χ^2(1, N=169) = 21.431, P < 0.001, Cramer's V= 0.356)) and type of house with social life ((χ^2(1, N=169) = 9.342, P = 0.002, Cramer's V = 0.235) and OR= 0.333, 95% CI (0.162, 0.685)).
11. There was correlation between educational level of respondents and job satisfaction (χ^2(1, N=166) = 30.668, P < 0.001, Cramer's V = 0.304)) and accident as a cause of LBP (χ^2(1, N=168) 8.989, P = 0.029, Cramer's V = 0.231)).
12. There was a strong correlation between the respondents' age with sedentary lifestyle (χ^2(1, N=170) = 12.934, P = 0.005, Cramer's V =0.276)), overcrowding (χ^2(1, N=170) = 14.970, P = 0.002, Cramer's V = 0.297)) and using technology (χ^2(1, N=170) = 8.495, P = 0.037, Cramer's V = 0.224)).
13. There was also a strong association between marital status of respondents and using technology (χ^2(1, N=170) = 11.299, P = 0.010, Cramer's V = 0.258)). This implies that single individuals were reported using technology prone them into LBP than other groups.
	• Lack of time for relaxation prone into different disorders.
	• Support from families and friends had many benefits for the overall well-being of individual.
	• Attending social gatherings had both benefits and risks for the participant.
	• Majority of them did not know how to cope up with stress and depression.
	• As living in the poorest country, majority of them did not live life as they want to live.
	• There was overcrowding in the living and working areas of most back patients.
	• Domestic violence has direct blow to back and indirect psychological trauma to the victim.
	• There were different traditional beliefs perceived by the back patients.
	• Majority of them did not know how to sit in upright posture, lift loads with care and pull and push objects.
	• According to their accounts, the health jeopardising behaviours for the development of LBP were:
	  ➢ Inactive lifestyle,
		• Overcrowding prone into physical and mental exertions.
		• Having better relaxation time and attending social gathering are important to reduce different disorders.
		• Presence of domestic violence prone into LBP.
		• Individuals with better lifestyle, familial support and social participation are less prone into LBP.
		• Poor knowledge on sitting posture and lifting techniques are health jeopardising behaviours that prone into development of LBP.
		• Majority of providers perceived that LBP is common disorder for all the humankind.
		• Most of the healthcare providers thought that LBP is self-limiting disorder.
		• Majority of the healthcare providers were not teaching the community about prevention strategies of LBP.
		• According to their accounts, the health promoting behaviours for the prevention of LBP were:
		  ➢ Active lifestyle,

QUANTITATIVE PHASE	QUALITATIVE PHASE	
14. There was a borderline statistical significance between the respondent's ethical background and utilising technology (χ^2(1, N=170) = 9.654, P = 0.047, Cramer's V = 0.238)). 15. The strongest correlation was also observed between the type of house and life expectations (χ^2(1, N=169) = 5.396, P = 0.020, Cramer's V = 0.179)) and OR= 0.466, 95% CI (0.244, 0.892)) and overcrowding (χ^2(1, N=170) = 6.331, P = 0.021, Cramer's V = 0.193) and OR= 2.197, 95% CI (1.185, 4.071)). Individuals living in a rent house were two times more susceptible into overcrowding. 16. There was a marginal correlation between job satisfaction of the respondents' and familial fighting (χ^2(1, N=168) = 6.129, P = 0.047, Cramer's V = 0.191)). Implies that dissatisfied individuals with their job were more liable into domestic violence. 17. There was a high correlation between the respondents age and chronic medical illness (χ^2(1, N=170) = 18.1085, P < 0.001, Cramer's V= 0.326)) and educational level and chronic illnesses (χ^2(1, N=168) = 18.793, P < 0.001, Cramer's V= 0.334)). Indicating as old aged and uneducated persons were more prone into deconditioning syndromes. 18. There is a marginal relationship between duration of LBP and chronic medical illnesses (χ^2(1, N=170) = 6.339, P = 0.042, Cramer's V= 0.193)). Indicating individuals presented with chronic LBP were more prone to develop deconditioning syndromes.	➢ Poor eating habit, ➢ Smoking cigarette and chewing khat, ➢ Sleeping on the floor, ➢ Poor transportation system, ➢ Travelling in a congested transport system and by standing on the bus, ➢ Lack of time for relaxation and social life, ➢ Poor coping mechanisms for stress and depression, ➢ Poor health seeking behaviours, ➢ Low adherence to the prevention and treatment strategies, ➢ Perceived LBP as incurable disease, ➢ Lack of awareness by policy makers, healthcare providers and society on back ergonomics, and ➢ Lack of interest to know more about the risk factors of LBP,	➢ Eating balanced diet, ➢ Avoid drinking alcohol, smoking cigarette and chewing khat, ➢ Participating in physical activity programme, ➢ Choosing the best fitting type of sleeping material, mattress, bed, and transportation mode, ➢ Taking adequate rest, ➢ Reduce walking near overcrowded areas, ➢ Being satisfied with job, ➢ Reduce physical and psychological exertions at the working area, ➢ Creating hostile working environment, ➢ Having fun with family members and friends, ➢ Participating in any form of social gatherings, ➢ Attending religious gatherings, ➢ Reduce stress and depression, and ➢ Seeking up-to-dated information about LBP.

The first phase of the study revealed that the risk factors of LBP ranged across individual, family, work and social levels. At individual level: sedentary lifestyle, poor interest in participating in physical activity programmes, overwhelming life expectations, poor sleeping habits, lack of knowledge on the selection of types of mattress, lack of knowledge on back ergonomics and presence of associated medical illnesses were risk factors for the development of LBP. At family level: lack of family support, lack of relaxation time with family members, type of house used to live, and familial fighting (domestic violence) were identified as risk factors for LBP. At work level: presence of workload, job dissatisfaction, prolonged sitting and standing, awkward body movements, and poor working environment were identified as predisposing factors for the occurrence of LBP. Finally, the influencing factors of LBP at the social level were social gatherings and being subjected to a poor transportation system.

Interviews with back patients revealed that lack of knowledge and awareness about prevention strategies of LBP had predisposed them to LBP. Moreover, the healthcare providers were not creating awareness programmes that offered information on the severity and impacts of LBP among the communities utilising different methods, i.e. TV, radio, and so on. This gap predisposed most of the productive age-groups within the community to backache.

The two phases of the study identified the key bio-medical and culture-based modifiable risk factors of LBP that can form the basis of the anticipated culturally sensitive preventative model. The following table illustrates further findings of the study based on the constructs of the health belief model.

Table 7.2 Summary of understanding susceptibility towards LBP according to the six constructs of health belief model

Survey findings	In-depth interview findings	Key informant findings
Perceived susceptibility 43% of patients agreed that there was a good possibility to develop LBP; 39.6% agreed that chance of getting LBP and 34.8% of them agreed that poor health contributed to their susceptibility.	Perceived susceptibility Most of them did not consider they might be at risk for LBP.	Perceived susceptibility Lack of awareness among the community increased susceptibility to LBP.
Perceived severity There were a statistically association between respondents' age and feeling about self (χ^2=22.005, P=0.037), interference of LBP (χ^2=24.841, P= 0.016), and income insecurity (χ^2=23.841, P=0.021). Perception changes towards self by age, pain & income.	Perceived severity LBP is a very serious disorder by changing perceptions to self and interferes with ADLs.	Perceived severity Healthcare providers did not give much attention for its severity and consequences.
Perceived benefits Medical treatment and taking painkillers showed a strong association with gender (χ^2= 13.110, P= 0.011; and χ^2 = 16.733, P= 0.002, respectively). Though females had better health promoting behaviours and adherence to medical treatments.	Perceived benefits Most patients did not know the benefits of attending medical treatments and taking painkillers.	Perceived benefits Most providers did not consider the importance of teaching the community to prevent themselves from LBP.
Perceived barriers Gender has showed association with interference of LBP on daily life (χ^2= 11.233, P= 0.024) and marital status had association with family support (χ^2= 25.021, P= 0.015). Though married individuals had better family support than single individuals. This infers that females encountered an of interferences of LBP on their life.	Perceived barriers Health jeopardising behaviours like lack of family support impedes the prevention of LBP.	Perceived barriers Lack of recognition of LBP as a disease is common among the participants.
Cues to take action There was association between educational level and eating habit (χ^2= 24.653, P= 0.017), and searching information (χ^2= 30.87, P= 0.002). This implies that educated individuals are eating a balanced diet and searching information on LBP.	Cues to take action Most patients were not ready to take actions before they developed the disorder.	Cues to take action They did not recommend the best way of actions used to prevent occurrence of LBP.
Self-efficacy There was a borderline correlation between age and lifting objects (χ^2= 21.422, P= 0.045). Though older individuals had poor knowledge on lifting techniques.	Self-efficacy Most patients did not know basic ergonomic measures.	Self-efficacy Most providers were not giving attentions to ergonomic educational programmes.

7.3 THE DISCUSSION OF THE STUDY RESULTS

This study intended to identify the bio-medical and culture based modifiable factors of LBP as an initial step toward the development of a culturally sensitive preventative model. Additionally, the study was strengthened by exploring the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours in the development of LBP. In addition to addressing the above stated objectives, the study has identified six areas of importance.

The identified six areas of importance were:

1. The prevalence and severity of LBP in the study area,
2. Perception of the back patients on the associated risk factors of LBP,
3. Perception of the back patients and thoughts of healthcare providers on the modifiable risk factors of LBP,
4. Insights into the factors associated with the development of LBP,
5. Insights on the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours on the development of LPBP, and
6. The impacts of LBP in the study area.

The literature review indicated a continuing dispute with regard to the bio-medical and culture based modifiable risk factors of LBP among different study populations. As mentioned in the literature review chapter (Chapter 2), there are challenges in reliably investigating bio-medical and culture-based modifiable risk factors of LBP. This is due to a lack of standardised inclusive tools and principles to quantity the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours as they relate to the development of LBP. A significant proportion of published findings did not emerge out of studies that utilised pertinent behavioural modification theories, i.e. health belief model. Additionally, they did not assess and explore the bio-medical and culture based modifiable risk factors of LBP that the respondents had been predisposed to and did not include the influence of culture on the development of health promoting and health jeopardising behaviours with respect to the occurrence of LBP from the diverse perspectives.

As stated in chapter three, the current study is guided by the bio-medical and the heath belief model. This models assist the researcher to set clear boundaries with regard to the scope of

the study and it also offers a clear basis for categorising modifiable risk factors into bio-medical and culture based factors. Based on these models, the researcher decided to conduct a mixed methods research to identify the associated risk factors of LBP among back patients and to explore the bio-medical and culture based modifiable risk factors of LBP among back patients and healthcare providers. Additionally, he explores the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours in the occurrence of LBP. In addition to the above stated concerns, the researcher adopted an explanatory sequential mixed methods design in this study. The choice of the study design indicates that the study is complex and should be conducted using multiple approaches. The overview of the phases of the study is presented in the following subsections of the study.

7.3.1 Overview of the phases of the study

The study was conducted in two phases. First, the quantitative phase was conducted on one hundred and seventy back patients to describe their demographic profile, to identify factors associated with the development of LBP, to estimate the burden and severity of LBP and to assess the influence of culture on the development of LBP. It was a hospital-based cross-sectional survey employed on back patients. The numerical data was transferred and generated through Epi Info, cleaned to check for its consistency and accuracy and analysed with the Statistical Package for Social Scientists (SPSS). Cross tabulation and Chi-square test of association between variables was computed. During presentation and analysis of the quantifiable data, tables, graphs and charts were generated. The pertinent findings were used to develop the instruments for the second phase of the study.

Second, the qualitative phase was followed up the quantitative phase using a phenomenological approach. Interviews were conducted by the researcher on eighteen back patients and eight healthcare providers within the natural environments. It was used to explore the bio-medical and culture based modifiable risk factor of LBP. It also intended to explore the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours on the development of LBP. Textual data were collected using in-depth interviews with back patients and key informant interviews with the healthcare providers. The data was entered into Atlas.ti software for data cleaning and for coding. The textual data was arranged with narrative statements with similarities, repetitions and related

issues in order to develop emerging themes. This phase presented a detailed description of back patients and healthcare providers perspectives to complement their subjective accounts. The qualitative findings were used to widen the scope and breadth of the quantitative findings.

Third, the pertinent findings of the first and second phases of the study were jointly presented in a separate chapter to have a broader understanding of the key bio-medical and culture-based modifiable risk factors of LBP in order to develop a culturally sensitive preventative model.

7.3.2 Site and study participant selection

There were different inevitable factors in the procedure of study site selection. The initial plan by the researcher was to include all public hospitals that are fund in Addis Ababa. But due to Neurology, Neurosurgery, Orthopaedics and Physiotherapy services are functional only at four hospitals (Tikur Anbessa Hospital, Zewditu Memorial Hospital, ALERT and St. Paul Millennium Medical College), it was compulsory to reduce the study sites into four public hospitals. Moreover, the pre-test was collected at St. Paul Millennium Medical College and the actual point of data collection was conducted at the remaining three public hospitals. Therefore, the researcher selected these three public hospitals as a suitable study sites among the public hospitals that are found in the Addis Ababa to address the objectives of the study.

After he selected the study sites in order to conduct the study, he submitted the application letter with the proposal, support letter of the regional learning centre, and the ethical clearance certificate obtained from the UNISA Higher Degrees Committee to Addis Ababa Regional Health Bureau to get ethical clearance. After two weeks, the Addis Ababa Regional Health Bureau ethical review committee provided a support letter and wrote to Zewditu Memorial Hospital and ALERT Hospital for permission to continue with the data collection in the study sites. However, the Institution Review Board of the Addis Ababa University, college of health sciences is independent from the regional health bureau and wrote a support letter to Tikur Anbessa Hospital in order to proceed to collect the data.

After finalising all the field work arrangements, the researcher went to the study areas and presented the Regional Health Bureau and Institutional Review Board support letter to the

public hospitals. The medical director of Zewditu Memorial Hospital and the chief clinical directors of Tikur Anbessa Hospital and ALERT hospital immediately wrote a short note on the back side of the support letters to the outpatient departments. Then the outpatient directorates wrote to the head of each purposively selected departments where the back patients were attending follow-ups. For the first phase of the study, the researcher requested the back patients to take part in the study voluntarily and he took written consent from them.

Within the qualitative phase, back patients and healthcare providers were purposively selected from the same hospitals and consent was taken accordingly. The use of both verbal and written consent confirmed the acceptance of participation from the back patients and healthcare providers.

7.3.3 Evaluation of findings

Generally, the study is comprehensive and more inclusive than the studies carried out previously on the phenomenon of LBP prevention. This study includes both the quantitative and qualitative enquiry methodologies. The results obtained from these two phases of numerous techniques and tools allowed the researcher to draw detailed and well considered conclusions about the prevalence, severity, associated factors and impacts of LBP in Addis Ababa.

As mentioned earlier, to date, there exists continuing debate and varying results about the bio-medical and culture based modifiable risk factors of LBP through numerous studies. Most of the former studies were based on survey data and were restricted to a few variables of interess; specifically, on the prevalence and associated factors of LBP (El-Sayed et al 2010; Machado et al 2016; Ogunbode et al 2013 & Zungu & Nigatu, 2015). They also did not focus on the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours in the development of LBP.

Subsequently this study utilises on the bio-medical and health belief models, its scope was more comprehensive than previous studies. It identifies bio-medical and culture-based modifiable risk factors of LBP from the back patients' perspectives. With respect to a few of the associated factors, the findings of the survey study are consistent with results of previous studies (Shemory et al 2015; Suri et al 2017; Rodrigues et al 2016 & Shmagel, Foley & Ibrahim 2016). It also further explores modifiable factors and the influence of cultural beliefs

on the development of health promoting and health jeopardising behaviours in the development of LBP from perspectives of back patients and healthcare providers' standpoints.

Low back pain is a multifactorial disorder and needs to be investigated from broad-based perspectives. All modifiable risk factors should be addressed to increase the possibility of the use of the developed preventative model. In this study, the second phase of the study explored wide ranging modifiable risk factors of LBP in relation to the health promoting and health jeopardising behaviours study done on the phenomenon of LBP prevention in the country.

Within the findings, the prevalence and severity of LBP was shown to be high. The risk factors of LBP were also identified from different levels (individual, family, work and social). Some of the bio-medical modifiable risk factors identified during the quantitative inquiry were deconditioning syndromes, smoking cigarette, drinking alcohol, poor health status, stress and depression. Whereas, some of the culture-based modifiable risk factors included sedentary lifestyle, type of mattress used to sleep, transportation mode commonly used to travel, life expectations and attending social gatherings.

The quantitative and qualitative findings also confirmed the presence of poor knowledge on back ergonomics among back patients, lack of culturally sensitive prevention strategies and lack of awareness-creating programmes about prevention and treatment strategies by the healthcare providers in the study area. Interestingly, from the qualitative inquiry, the healthcare providers asserted that 'all most all of us are at risk of LBP sometime in our life'. Other healthcare providers also identified LBP as 'an incurable disorder'. From the in-depth interviews, the health jeopardising behaviours that contributed for the development of LBP ranged from individual to social levels (Table 7.1 above). That was due to lack of detailed insights on susceptibility towards the occurrence of LBP.

Overall, the impacts of LBP in the study area were significant and its factors were multifaceted. The available prevention and treatment strategies are also ineffective in order to prevent healthier individuals from back pain and to treat individuals affected by LBP. The brief presentations on the results obtained through the two phases of the study and each of their particular data collection procedures were outlined as follows.

7.3.4 Findings of the quantitative phase: analytical cross-sectional survey

The survey focused on addressing four main areas: 1) describing the demographic profile of individuals affected by LBP, 2) identifying factors associated with the development of LBP, 3) estimating the burden and severity of LBP, and 4) assessing the influence of cultural beliefs on the development of LBP in order to identify the key bio-medical and culture based modifiable risk factors of LBP. In this study, the researcher collected numerical data from the back patients who were diagnosed with back pain by a healthcare professional. Hence, the first phase of the study was conducted on the back patients.

The health belief model demonstrated that health promoting, and health jeopardising behaviours are a product of six domains that included perceived susceptibility, perceived severity, perceived barriers, perceived benefits, cues to take action and self-efficacy. According to the model, a prevention method designed to prevent occurrence of LBP should address all of the six domains of the model. Furthermore, the preventative model should also include the general concepts from the bio-medical model and the researcher included a model. Unless, the model is inclusive of the six domains of the HBM and the bio-medical model, it is impossible to bring a sustainable influence on the development of health promoting behaviours among the community for the prevention of LBP. In this study, the researcher focussed mainly on bio-medical and culture-based modifiable factors of LBP. He strongly agrees that the modifiable risk factors included on the study were relevant to use for the development of the model for the prevention of LBP on healthier individuals.

Based on the above concepts, the one-year prevalence of LBP was high in the study area. It showed significant fluctuations for the one-year period. Almost all of the reported cases of LBP were chronic in nature and had started gradually. The recurrence rate was also considerably high. Furthermore, there was a strong correlation between the occurrence of back pain and presence of chronic medical illnesses. This implies that the presence of deconditioning syndromes for a longer duration increased the risk of developing LBP and vice versa. In addition, LBP is a multifactorial disorder and its risk factors ranged from lifestyle, work-related, psychosocial and socio-cultural standpoints. As noted in table 7.1 above, the lifestyle modifiable risk factors of LBP that showed statistical associations with the demographic profile of individuals with LBP included gender with exercise habits (χ^2= 9.086, P= 0.003, Cramer's V= 0.231) and OR= 2.96, 95% CI (1.44, 6.096), age with

transportation mode (χ^2= 22.052, P= 0.037, Cramer's V= 0.208), educational level with choice of mattress (χ^2= 34.181, P= 0.000, Cramer's V= 0.319) and educational level with transportation method (χ^2= 21.642, P= 0.042, Cramer's V= 0.207).

Additionally, the modifiable work-related risk factors that showed statistical significant association with the demographic profile of individuals with LBP were age with job satisfaction (χ^2= 20.059, P= 0.003, Cramer's V= 0.244), movement patterns (χ^2= 17.645, P= 0.001, Cramer's V= 0.322) and prolonged sitting (χ^2= 7.620, P= 0.045, Cramer's V= 0.212); educational level with job satisfaction (χ^2= 30.668, P <0.001, Cramer's V= 0.304), workload (χ^2= 20.749, P= 0.002, Cramer's V= 0.249) and working environment (χ^2= 17.815, P= 0.007, Cramer's V= 0.230); ethnicity with job satisfaction (χ^2= 16.496, P= 0.036, Cramer's V= 0.222) and movement patterns (χ^2= 9.704, P= 0.046, Cramer's V= 0.239); type of house with prolonged sitting (χ^2= 4.996, P= 0.025, Cramer's V= 0.171), OD= 0.438, 95% CI (0.211, 0.912), prolonged standing (χ^2= 4.537, P= 0.033, Cramer's V= 0.163) and OR= 1.938, 95% CI (1.051, 3.572)) and movement patterns (χ^2= 7.921, P= 0.005, 0.216, Cramer's V= 0.216) and OR= 2.455, 95% CI (1.306, 4.615), and occupation with patterns of movement (χ^2= 24.596, P= 0.001, Cramer's V= 0.381).

Psychosocial modifiable risk factors that showed statistical association with demographic profiles included age with time for relaxation (χ^2= 10.106, P= 0.018, Cramer's V= 0.244); religion with attending social gatherings (χ^2= 9.970, P= 0.019, Cramer's V= 0.243); ethnicity with participating in social life (χ^2= 21.431, P <0.001, Cramer's V= 0.356) and type of house with social life (χ^2= 9.342, P= 0.002, Cramer's V= 0.235) and OR= 0.333, 95% CI (0.162, 0.685).

The socio-cultural modifiable risk factors that showed association with the demographic profiles of individuals with back pain were educational level with accident (χ^2= 8.989, P= 0.029, Cramer's V= 0.231); age with sedentary lifestyle (χ^2= 12.934, P= 0.005, Cramer's V= 0.276), overcrowding (χ^2= 14.970, P= 0.002, Cramer's V= 0.297) and using technology (χ^2= 8.495, P= 0.037, Cramer's V= 0.224)); marital status with using technology (χ^2= 11.299, P= 0.010, Cramer's V= 0.258); ethical background with utilising technology (χ^2= 9.654, P= 0.047, Cramer's V= 0.238) and type of house with life expectations and overcrowding (χ^2=

5.396, P = 0.020, Cramer's V= 0.179) and OR= 0.466, 95% CI (0.244, 0.892); χ^2= 6.331, P= 0.021, Cramer's V = 0.193) and OR= 2.197, 95% CI (1.185, 4.071) respectively).

There was also association between presence of chronic medical illnesses with the respondents age (χ^2= 18.1085, P <0.001, Cramer's V= 0.326), educational level (χ^2= 18.793, P <0.001, Cramer's V= 0.334) and duration of LBP (χ^2= 6.339, P= 0.042, Cramer's V= 0.193).

The constructs of HBM that showed a statistical significant association with the demographic profile of back patients were respondents' age with feeling about self (χ^2= 22.005, P= 0.037), LBP prone into different problems (χ^2= 24.841, P= 0.016) and financial insecurity (χ^2= 23.841, P= 0.021); gender with taking painkillers (χ^2 = 13.110, P = 0.011), financial insecurity (χ^2= 16.733, P= 0.002), interference of LBP on daily activities (χ^2= 22.949, P = 0.028) and interference of LBP on the daily life (χ^2= 11.233, P = 0.024); marital status with family support (χ^2= 25.021, P= 0.015); and educational level with eating a balanced diet (χ^2= 24.653, P= 0.017), searching information (χ^2= 30.871, P = 0.002); and finally age with lifting objects (χ^2= 21.422, P = 0.045).

Occurrence of LBP should be prevented by suitable and appropriate prevention mechanisms. In order to prevent its occurrence, a relatively healthier individual must be aware of his/her vulnerability, perceived severity, perceive the benefits and barriers of the available prevention methods. Based on the constructs of the HBM, the majority of the respondents perceived that attending medical treatments and taking painkillers were important to prevent occurrence of back pain. Individuals perceived that costs of the medical treatments and the impact of pain on their daily life made them not to follow the orders from healthcare providers. Likewise, adequate knowledge on back ergonomics and following health promoting behaviours, i.e. searching for information about one's health, eating traditional foods, lifting with great care and so on, all played a significant role in the prevention of LBP among healthier individuals.

The findings from the survey also indicated that LBP was affecting the most productive group of the community. But male and female individuals were almost equally affected. The majority of the back patients were orthodox followers, married and have at least one child. This study also revealed that the ethnic group from Amhara were more prone to LBP than

any other group. Similarly, the highest percentage of individuals with back pain were employed in a formal sector. Thus, back pain is affecting individuals who were actively involved in the economic sector of the country.

The commonest impacts of LBP on sufferers were pain, increased utilisation of healthcare services, taking rest, and poor general health. Similarly, the severity of pain on the VAS ranged from mild to moderate in the study setting. Moreover, individuals affected by back pain reported that their feelings towards themselves changed after they developed back pain. The study also indicated that individuals with back pain had poor sleeping hygiene. Additionally, the study participants mentioned that back pain interfered with their activities of daily livings (ADLs).

Finally, the researcher integrated the key bio-medical and culture-based modifiable risk factors for LBP to develop a culturally sensitive preventative model. The subsequent section will present some of the pertinent results of the qualitative phase of the study from back patients and healthcare providers perspectives.

7.3.5 Findings of the qualitative phase: phenomenological approach

The objectives of this phase were predominantly concentrated on two areas: 1) exploration of the bio-medical and culture-based modifiable risk factors of LBP, and 2) exploration of the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours for the development of LBP. The data generated through in-depth interviews with back patients and key informant interviews with healthcare providers in order to strengthen and widen the scope of the first phase of the study. As it has been presented in the preceding sections of the study, there are numerous health jeopardising behaviours that played noteworthy influences in the development of LBP and could contribute greatly for its occurrence.

Based on the findings from the previous phase of the study, seven themes were developed to explore further the modifiable risk factors of LBP. These were chronic medical illnesses, lifestyle factors, work-related factors, psychosocial factors, socio-cultural factors, back ergonomics and the influence of culture on the health promoting and jeopardising behaviours for the development of LBP. Therefore, the next subsections present the qualitative findings of the study stated as thematic areas.

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❖ **Findings of the in-depth interviews of the back patients**

A total of eighteen back patients participated in the study. The mean duration of LBP among the interviews was nearly ten years. The majority of them had diagnosed with at least one type of deconditioning syndromes. They stated that presence of chronic medical illness predisposed them into LBP and vice versa. Additionally, they stated that taking contraceptives for a longer duration had predisposed them into back pain. Interestingly, some participants did not know the association between the presence of deconditioning syndromes and taking contraceptives with the occurrence of back pain.

According to their perspectives, majority of them mentioned that their lifestyles were a contributing factor for the development of LBP. They believed that the lifestyles they used to live were traditional and exposed them to different demanding jobs at their home, village, work and other social settings. This further escalated by the type of foods they commonly eat and other behavioural activities such as drinking alcohol, smoking cigarettes and chewing khat. Most of them did not know how to maintain an ideal body weight. They also added that exercise habits are important to reduce the pain level they felt and prevent new episodes of LBP. The majority of them believed that they were minimally involved in physical exercise. Furthermore, they mentioned that selecting a comfortable mattress for sleeping and convenient modes of transportation system were vital in order to reduce the symptoms related to LBP.

Regarding the work-related modifiable risk factors of LBP, majority of them were exposed into prolonged sitting, prolonged standing, doing tasks in awkward body postures, and doing tasking beyond their capacity level and professional skills. This was further escalated by unsuitable working environments that predisposed them into deviated body postures, physical and psychological exertions. They added that due to the above reasons, they are not happy with their work and dissatisfied about the things they performed in their working stations. However, some of the back patients were indicated that it is vital to work based on the individualised optimal level and professional skills to be happy with the current assigned position.

In relation to the psychosocial modifiable risk factors, they mentioned that lack of time for relaxation, lack of family support and stress and depression can increase healthier

individuals to develop back pain. Additionally, they stated that ambitious life expectations, exposure in overcrowded areas, domestic violence and traditional beliefs were the socio-cultural risk factors for the development of LBP. However, having fun with families and friends, family support, attending in religious ceremonies and social gatherings could be seen as both preventive and treatment strategies for LBP.

According to their perspectives, their knowledge about back ergonomics was poor. They were uninterested to know more about back pain prior to developing the disorder. Respondents indicated that they did not have any information about how to get up from bed properly, how to sit in an upright body posture, how to lift loads with great care, how to pull, push and carry weights. Further, they stated that no one told them about how to perform the above stated ergonomic measures and they mentioned that they were performing based on their prior knowledge and experiences. Accordingly, they indicated that these mentioned risk factors are linked into one another and predisposed them into back pain.

❖ **Findings of the key informant interviews**

All of the healthcare providers were providing clinical services for back patients. The researcher presented to them, the pertinent findings from the quantitative phase of the study in order to classify the modifiable risk factors into bio-medical and culture-based risk factors. They stated that deconditioning syndromes, accidental falls, use of contraceptives, stress, depression, poor sleeping hygiene and poor knowledge on back ergonomics are the bio-medical modifiable risk factors. However, sedentary lifestyle, poor eating habit, drinking alcohol, smoking cigarette, chewing khat, poor body weight control, physical inactivity or over activity, soft or hard types of sleeping material, use of poor transportation systems, prolonged sitting, prolonged standing, job dissatisfaction, workload and unsuitable working environment were the culture based modifiable risk factors for LBP. Further, they added that overwhelming life expectations, presence of overcrowding, lack of time for relaxation, lack of family support, domestic violence and cultural beliefs also contributed for the occurrence of back pain.

According to their accounts, the health promoting behaviours that contributed to preventing LBP were: active lifestyle, eating a balanced diet, avoiding alcohol, avoid smoking cigarettes and chewing khat, participating in physical activity programmes, choosing the best fitting

type of sleeping material, mattress, bed, and transportation mode, taking adequate rest, reducing walking near overcrowded areas, being satisfied with one's job, creating a hostile working environment, having fun with family members and friends, participating in any form of social gatherings and religious ceremonies, reduce stress and depression, and seeking information about LBP.

According to their accounts, the health jeopardising behaviours that contributed to the development of LBP were: inactive lifestyle, poor eating habit, smoking cigarette and chewing khat, sleeping on the floor, poor transportation system, travelling in a congested transport system and by standing on the bus, lack of time for relaxation and social life, poor coping mechanisms for stress and depression, poor health seeking behaviours, low adherence to the prevention and treatment strategies, perceived LBP as incurable disease, lack of awareness by policy makers, healthcare providers and society on back ergonomics, and lack of interest to know more about the risk factors of LBP.

Awareness about the health promoting and health jeopardising behaviours for the occurrence of LBP is the key for the development of a culturally sensitive prevention model. Thus, not only for the prevention of LBP, but also for other musculoskeletal disorders, we need to have a culturally different and sensitive prevention model which can addresses any aspects of chronic illnesses. The model should be easily understandable and integrated into the whole sections of the community without any language and culture barriers to prevent new episodes of LBP accordingly to influence cultural beliefs, social structure, knowledge, attitude and behaviours.

In general, this study reveals that highest prevalence of LBP, highest proportion of severe cases of LBP and profound misunderstandings of the health promoting behaviours on LBP among the participants. There were also knowledge gaps on basic back ergonomics and some other additional precautionary measures. Moreover, the impacts of LBP are very serious and the available interventions to treat cases and prevent new episodes of LBP were ineffective. According to these findings, it is an appropriate time for the study area and the Addis Ababa region, to develop an integrated preventive method to prevent occurrences of new cases of LBP.

7.3.6 Areas of agreement/disagreement between research findings

This study integrates both the quantitative and qualitative methods to develop a culturally sensitive preventative model in the study area. It explored the modifiable risk factors of LBP in-detail and the scope of the study is comprehensive than aforementioned studies about the phenomenon of LBP prevention. Afterwards, it assists the researcher to develop an effective integrated preventative model for the prevention of LBP. The study aims to explore the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours in the actual settings. The study also proposes a prevention model to prevent the communities from back pain.

The quantitative phase of the study was a hospital-based analytical cross-sectional study. It included 170 study subjects aged 18 and above years. The prevalence of LBP was 31% in the study area. About the prevalence of LBP, the findings of this study are inconsistent with El-Sayed et al (2010:90), Meklau et al (1997) and Zungu and Nigatu (2015). This may be due to the difference in the selection of study subjects and study area. Improving the quality of medical services provided for new and old cases of backache is equally vital to build trust and confidence with the patients on the curative or preventive programmes. If the back patients are cured within the available healthcare services they have received, they would have been promoting the preventive strategy within their residential areas significantly more than any other parties.

The independent variables computed to identify that the associated factors in this study were age of the study participants, gender, marital status, educational level and type of house, which have been consistently reported in most literature (Arunsawas et l 2017:152; Ogunbode et al 2013 & Jegan, Brugger, Viniol, Strauch, Barth, Baum, Leonhardt & Becker 2017:1). The findings of this study revealed that lifestyle, work-related, psychosocial and socio-cultural factors played significantly for the development of LBP. Regarding to the lifestyle factors; exercise habit, type of mattress and transportation mode were showed a direct correlation with the demographic profile of individuals affected by LBP. Although the survey measured the lifestyle factors subjectively, which other studies had done consistently, generally lifestyle factors are often determinants for the development of LBP (Jegan et al 2017:2).

The work-related factors that showed statistical association with the demographic profile of individuals were job dissatisfaction, movement patterns, prolonged sitting, prolonged standing, workload and unsuitable working environment. Similarly, the psychosocial factors that indicated a statistically significant association with the demographic profile of individuals were time for relaxation, attending social programmes, accidental falls and dealing with the stress of daily life. Finally, the socio-cultural factors that showed a statistical association with the demographic profile were sedentary lifestyle, overcrowding, life expectations, and familial fighting (domestic violence). Thus, the influence of cultural beliefs played noteworthy role for its occurrence.

In the qualitative phase, the thematic areas of interest included chronic medical illnesses, lifestyle factors, work-related factors, psychosocial factors, socio-cultural factors, knowledge on back ergonomics, influence of culture on the health promoting and health jeopardising behaviours and impacts of LBP. The findings of this study were consistent with the findings of Singh et al (2018) conducted in the UK with regard to exploring the lived experience and beliefs about LBP. They argued that culture drastically influences the incidence of LBP.

In general, literature also agrees that the need of an appropriate prevention strategy is essential to prevent occurrence of back pain. This study revealed that the western bio-medical interventions on the management and prevention of LBP are not effective in the study area. The findings of both the quantitative and qualitative phases of this study support this idea as a culturally different prevention method is essential to prevent new episodes of LBP by incorporating the bio-medical and culture-based modifiable factors.

7.3.7 Critical evaluation of the methodology used

The study is a bio-medical and health belief model driven by a sequential explanatory mixed methods research. The researcher adopted a mixed method approach to comprehensively address the complex issue of LBP in public hospital settings. There have been no similar previous study's conducted on the exploration of cultural dependent modifiable risk factors on the development of LBP. It involved the enquiry of the quantitative phase to assess the demographic profile of individuals affected by LBP, to identify associated risk factors, to estimate its prevalence and severity and to assess the influence of cultural beliefs on the development of LBP. According to Creswell and Clark (2007) the use of surveys in the

subjective phenomenon such as LBP has been disputed in some literature. Admittedly, the use of a survey in this study would deny the researcher the ability to objectively highlight the areas that require focus in the development of the future plans of the study. Thus, the use of a survey provides the foundation for the identification of possible unexplored areas in the cultural dependent modifiable factors of LBP within the public hospital setting. The findings of the survey were used to develop the interview guidelines of the qualitative phase of the study.

The modifiable factors of LBP should be explored from individuals lived-experiences who suffer with the condition and healthcare providers' expertise knowledge who are actively involved in the care of patients with the disorder. In this phase, the researcher conducted two data collection techniques to generate reliable data on the exploration of bio-medical and culture based modifiable risk factors of LBP and the influence of cultural beliefs on the development of LBP in the study area. They were in-depth interviews and key informant interviews. The interview schedules were conveyed based on the quantitative phase of the study. The interviews were conducted with minimum disturbance in natural settings in the clinics where follow-ups were provided.

Finally, the textual data was analysed both deductively, using the already identified themes from the first phase of study and inductively, using the emerging themes. This process was assisted by utilising Atlas.ti version 7 software. It was used to explore the bio-medical and culture based modifiable risk factors of LBP and the influence that cultural beliefs had on the development of LBP in the study area.

By integrating the two phases of study, it is possible to draw a valid and reliable conclusion on the development of a culturally sensitive preventative model in the study area. The study identifies the bio-medical and culturally based modifiable risk factors. It also provides broader and unique insights on how culture influences health promoting and health jeopardising behaviours on the development of LBP in a real setting. It also provides a concrete premise to develop the model for the prevention of LBP since advocating health promoting behaviours is the only prevention method for the prevention of LBP. This interesting pertinent finding from the two approaches would not have been possible from the use of either a quantitative or a qualitative methodological method. The next section will present the process that was followed in order to develop the culturally sensitive preventative model.

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7.4 DISSEMINATION OF THE RESEARCH FINDINGS

7.4.1 Model development process

The purpose of conducting this research is to generate a new preventative model through the use of different philosophical assumptions. It is often hard to translate this preventative model into practice. There are numerous factors that could influence this lack of transition such as an individual's culture. As indicated by the key findings from the survey and interviews in this study, the back patients' perceptions and lived experiences and the healthcare providers' explanations for the modifiable risk factors vary. The researcher became more effective in presenting the findings by combining the quantitative and qualitative phases of the study. Further finding that the application process of the model should be based on the active engagement of the community rather than passive engagement, where there is an assumption that people will read or listen to the information presented and start implementing the behavioural changes suggested. Active methods used to disseminate the model includes mass educational programmes through mass media and social media, awareness creating programmes by healthcare providers and educational pamphlets.

In this study, assumptions from the literature review, the theoretical framework models and pertinent findings provided insights on the development of the preventative model for the prevention of LBP among healthier individuals residing in Addis Ababa. A symbolically represented model highlights the notable culture-dependent modifiable risk factors of LBP. It is essential to diagrammatically illustrate the theories identified from the study so that the elements of the model can be applied practically by the communities and other healthcare providers when they are teaching the public about the prevention methods of back pain. The main purpose of the model is to encourage health promoting behaviours, to discourage health jeopardising behaviours and to propose recommendations to Governmental institutions, Healthcare providers and the Community. Hence, the development of the model is founded on the following two assumptions (Eccles, Grimshaw, Walker, Johnston & Nigel 2005):

❖ The modifiable factors of the model are changeable risk factors such as lifestyle, cultural beliefs and the perception of the working environment.

❖ The model will consider the assumption that healthier individuals do not always have complete control over their lifestyle and actions.

The researcher further included the aims of the traditional prevention method in this study. Ali and Katz (2015:322) indicated that prevention is an action aimed at eradicating, eliminating or minimising the development of LBP in the general public. They stated that there are four levels of prevention spectrums, primordial, primary, secondary and tertiary. The definition and aims of each approach is presented as follows:

1) Primordial prevention is focused on the prevention of the total population, or targeted groups, by identification of the modifiable risk factors that lead to LBP.
2) Primary prevention is dedicated to preventing the transmission of LBP on the total population by identifying its specific causal factor.
3) Secondary prevention aims to treat patients who develop LBP at an early stage.
4) Finally, tertiary prevention is focused on the management or rehabilitation of patients who are in the later stages of back pain.

Therefore, the model for this study will be implemented at the primordial prevention level, where LBP has not yet occurred, since this is the time when health promoting behaviours are formed, usually during childhood or at a later age. At this level, efforts are directed towards discouraging individuals from adopting heath jeopardising behaviours through dietary interventions, lifestyle and environmental modifications, behavioural changes and health education programmes. The researcher also believed that utilising a preventative model which, benefits the general population, is more effective and efficient than focusing only on a single individual. In order to adhere to the principles stated above, the knowledge translation process is applied to instigate a process of recommending how to adopt health promoting behaviours and discourage health jeopardising behaviours of healthier individuals who live in Addis Ababa. The next subsection will present the knowledge translation process that was followed by the researcher.

7.4.1.1 Knowledge translation process

Knowledge translation is the discussion, synthesis and ethically sound presentation of a preventative model within a complex system of communication among the researcher and the community to prevent the occurrence of LBP (Sudsawad 2007:1). She also stated that

the features of the knowledge translation process ranges between the methods used to investigate the study and its application of the developed preventative model in the community. Knowledge translation is an interactive process which encompasses effective communications between the researcher and the population of Addis Ababa. Hereafter, the knowledge translation process assists the researcher to apply the findings of this study to prevent the incidence of back pain.

There are various knowledge translation models that are relied upon to convert the preventative model into practice. Commonly used approaches in unique cultural contexts are the Graham and Stetler model. These two models form the foundation for the knowledge translation process in this study. In disseminating the findings from this study, the researcher implemented the combined features of knowledge and action into the Graham, Logan, Harrison, Straus, Tetroe and Caswell (2006) and Steller model of research utilisation. The first model is useful for facilitating the use of the preventative model by policymakers, healthcare providers, the public and other stakeholders. The model has two components: (1) model conception and (2) action component. This model is dynamic and complex with no definite restrictions between the model conception and action phases. The action component stages may occur sequentially or simultaneously, and the development of the model phase might influence the action phases. The diagrammatical presentation of the model is presented in Figure 7.1 below.

Knowledge creation comprises of three phases: research inquiry, literature synthesis and research tools. It is presented as an inverted funnel with the majority of the research processes presented in the beginning. These steps are then minimised in number through knowledge synthesises and, finally, to an even smaller number of research tools to facilitate translation of the preventative model into practice. When the knowledge moves down the funnel, it becomes more purified and refined. The needs of potential preventative model users can be incorporated into each phase of the model development, such as modifying the research questions to address the objectives of the study, developing the model for the community and modifying the approach of dissemination to better reach the community.
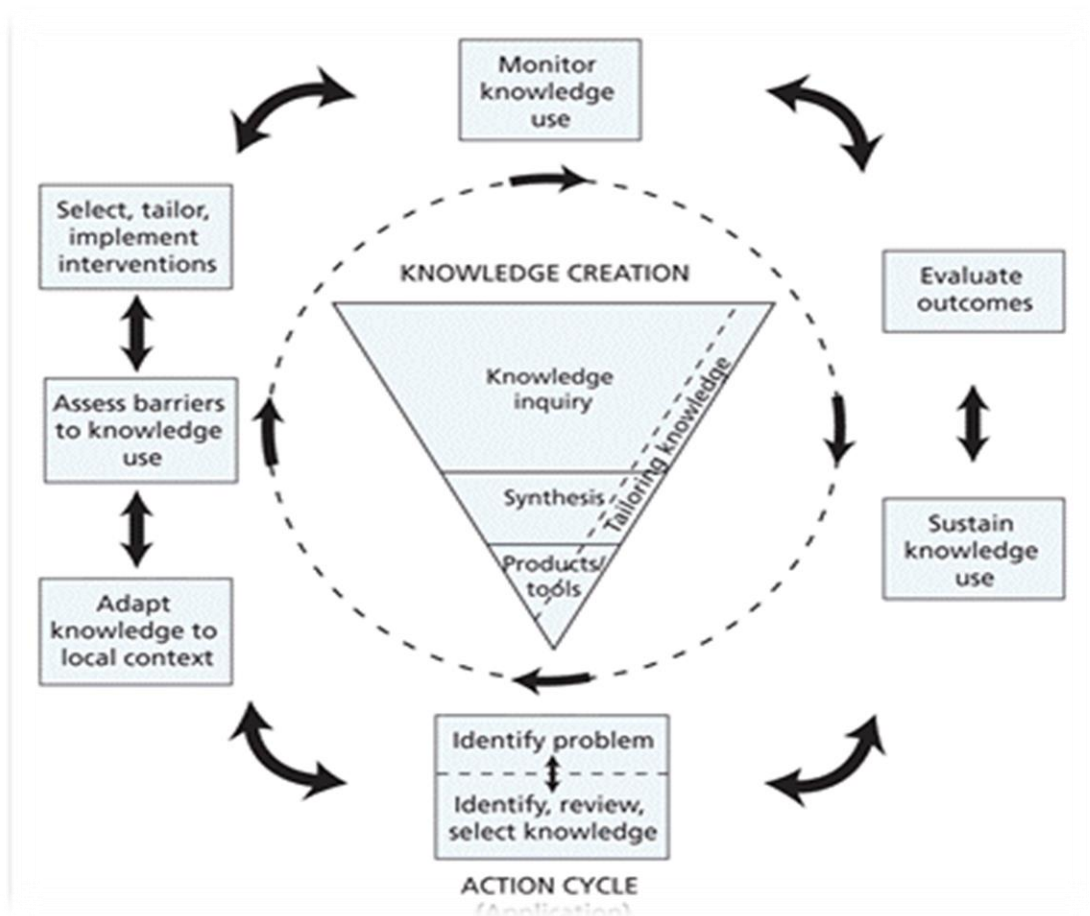
Figure 7.1 The knowledge into action model (Graham et al 2006)

The action component presents the activities required for the development and application of the preventative model. This cycle is a dynamic process where all phases in the model can influence one another and can also be influenced by the model development process. The action component starts with individuals identifying their susceptibility to LBP, as well as the relevance of the preventative model to prevent its occurrence. This component also included the appraisal of the preventative model in terms of its usefulness and validity in the prevention of LBP. The preventative model was then adapted to fit the local culturally different context.

The next step is to assess the enablers and barriers related to the use of the preventative model, the potential adopters, and the cultural and social contexts in which the preventative model is to be utilised. This inquiry is then used to develop the preventative model to assist and promote awareness and application of the preventative model. Once the model is developed and executed, the next step is to monitor the use and application of the model in

terms of conceptual utilisations, behavioural changes in levels of understanding, changes towards perceptions and attitudes, model utilisation and manipulation of the model to attain specific health promoting behaviours. This step is important to determine the effectiveness of the preventative model and plan, enabling researchers the ability to make the necessary modifications. During this process, it is important to evaluate the impact of utilising the preventative model to understand if usage has made a difference in the prevention of LBP in the community. There also needs to be a plan in place to ensure endurance of the use of the model in varying cultures and environments and over a period of time.

The interactions between the action phases within the cycle is not unidirectional. Rather, each step can be influenced by the stages that preceded it and vice versa. For example, the preventative model not being used and adopted as intended could indicate the need to review the components of the preventative model again to improve its application. Therefore, the knowledge into action process model includes the need to adapt the preventative model to fit within the local cultural contexts and the need to sustain the preventative model usage by anticipating behavioural changes and adapting it accordingly.

Following these concepts, the culturally sensitive model will be developed by utilising the Stetler model. This model emerged from nursing literature which emphasises how the healthcare practitioners can utilise the preventative model for the prevention of LBP in the general population (Beidas, Mehta, Atkins, Solomon & Merz 2013:10). Even though the model was primarily designed to be utilised and practiced by a single user or practitioner, the researcher employed the model in order to design the preventative model. This model consists of five main stages: (a) preparation, (b) validation, (c) decision making, (d) translation/application, and (e) evaluation. These stages are diagrammatically presented in the following figure.
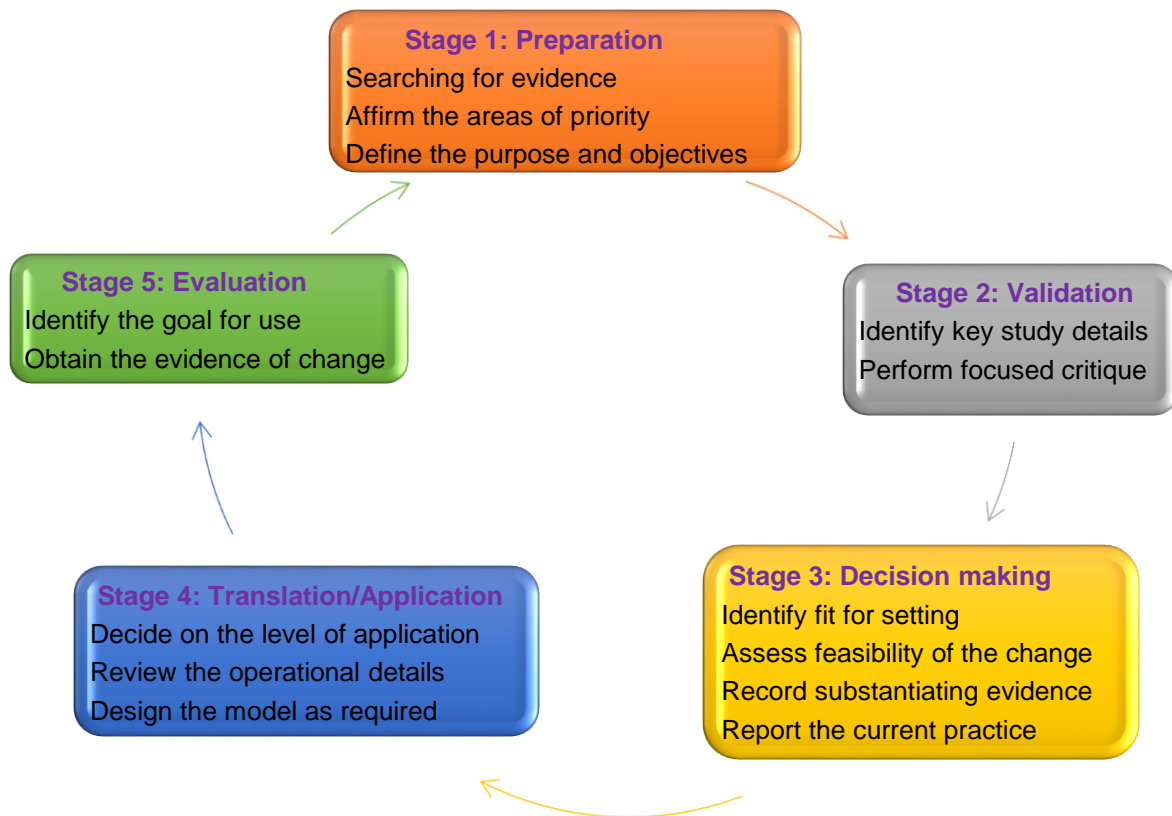
Figure 7.2 Steps of model development process (Makua & Tennyson 2014:236)

7.4.1.1.1 Preparation stage

The first step of the preventative model development process involves prioritisation of the research problem, sorting through the literature and identifying the purpose for developing the preventative model and the process of transferring this model into reality. The vigorous process of the literature review in Chapter two provides the initial gateway for the dissemination of the findings of the study. The literature review identified the key bio-medical and culture based modifiable risk factors for LBP to develop the model. The triangulation of survey and interviews in this study and the appraisals of the study findings confirmed the culture dependent modifiable risk factors that was used to develop the preventative model, by bringing behavioural changes on the community. The researcher purposefully conveyed the aim and objectives of the research and the study methodology as described in Chapter four of the study, and provided the research evidence to generate the need to develop a preventative mode in the current culturally different settings.

7.4.1.1.2 Validation stage

This stage involves the critical appraisal of the literature sources for relevance of the prevention model and thus making a decision to include or exclude the identified sources. After collection of numerical and textual data, the researcher analysed the results as mentioned in Chapter 6 and Chapter 7 of the study. The analysis of the two phases of the study identified the areas of agreement and disagreement in the exploration of culture dependent modifiable risk factors of LBP. As described in the integration phase of the study, firstly the findings indicate that back patients have poor knowledge towards the ergonomic measures that used to prevent LBP. Secondly, the healthcare providers are not interested to create awareness on the community about the prevention of LBP, thirdly the cultural beliefs of back patients directly or indirectly influences the development of health promoting and health jeopardising behaviours. Finally, the risk factors of LBP ranges from individual, family, work and social levels.

7.4.1.1.3 Decision making

The comparative evaluation or decision making process used to assess the transfer of the preventative model into practice relies on the following eight principles:

1) *Suitability for the study area:* evaluation of suitability of the model for a culturally different setting is necessary. The Ethiopian health policy focused on the prevention of diseases or disorder rather than treating/rehabilitating patients (FMoH). The policy indicates the need to have an applicable prevention method to all in terms of planning the community awareness programmes. Thus, application of the model includes actively involving the community in the prevention of LBP.

2) *Feasibility:* assessment of the feasibility of the application of the model is essential to integrate the model within the context of the country. An integrated model in back pain prevention is particularly important because the risk factors of LBP is complex, especially the bio-medical and culture based risk factors plays noteworthy for its occurrence. The integrated model also acknowledges the presences of a complex social and cultural contexts within the study area. Further, the development of the model is not against the existing prevention policy as that will increase the chances of rejection by the policymakers.

3) *Addressing health promoting and health jeopardising behaviours:* exploration of the cultural and social factors in vulnerability of LBP relating to the application of proposed model is the main aim of the current study. The researcher considers the health promoting behaviours that protect individuals from backache, and the health jeopardising behaviours that makes persons vulnerable to it. These factors are essential to develop the model. The model also enhances the promotive/protective factors, while reducing the jeopardising modifiable risk factors for the incidence of LBP because these factors are explicit to the community who are living in Addis Ababa.

4) *Resources:* availability of resources to develop the preventative model and it also should be implemented within the sensible resources of the country.

5) *Readiness of others:* the willingness of others to accept the newly recommended prevention framework is vital to maintain its sustainability. Sustainability of the model is further maintained by active involvement of the community, healthcare providers and stakeholders who are responsible to implement the model.

6) *Validating the evidence:* in utilising the validated sources in the appraisal of literatures contrary to the pertinent findings of the study, the researcher assesses the potential value that the findings are within the knowledge spectrum. Further, the researcher designed the model based on the pertinent findings obtained from the three phases of the study through a clearly stated research aim, objectives and questions.

7) *Current prevention method*: evaluation of the current prevention method to evaluate effectiveness of up-to-dated prevention approach is necessary to avoid unnecessary duplications. It also used to understand the continuum of the decision making process used to develop the model. The currently available western country driven prevention methods does not incorporate the socio-cultural factors that are specific to Ethiopia. Here it is essential to integrate these factors within the current integrated model.

8) *Duration and intensity:* success of the model tends to erode through time, which requires continues re-evaluation and monitoring. In order to ensure its duration, the researcher developed the model based on the burden of the problem. He further anticipated that the model will be used for the next five years and other researcher will refine its application. Though, the intensity of the model is maintained by integrating the key bio-medical and culture based modifiable risk factors of LBP.

7.4.1.1.4 Translation/ Application

The translation of the model is illustrated figuratively as a formal guiding principle to target the community who are residing in Addis Ababa. The researcher developed this model with the main aim of preventing new episodes of back pain in order to promote health and well-being of the population through encouraging health promoting behaviours and discouraging health jeopardising behaviours. The model emphasises that the community are at the centre of the prevention agenda. The literature review related to the prevention of LBP and findings of the study were integrated into five different levels. The central levels are individual, family/friends, social, cultural and working environment and presented as follows.

❖ Level one: Individual level

Every Individual should perceive their vulnerability towards LBP before they developed the disorder. Back pain cannot prevent without knowing the benefits of active lifestyle, psychological well-being, good knowledge on the back ergonomics, and preventing and early management of deconditioning syndromes/chronic medical illnesses. The understanding of these levels can be applicable by implementing several other lifestyle preventing methods, such as being aware of the behavioural practices of individuals who are residing inside the community before taking action with them, being eager to know the benefits of avoiding drinking alcohol, smoking cigarette and chewing khat, and engaged actively in any exercise programme for at least three times a week, keeping an ideal body weight, utilising the best fitting and convenient type of mattress, bed and transportation mode. In addition to this, having an adequate sleeping time and taking enough resting period is essential to prevent the occurrence of back pain among the healthier individual. Next to the lifestyle component of the model, mental aspects of every individual is a key to cope up with stressful situations and other day-to-day life burdens. If someone could manage stressful and depressive events, he/she can drastically prevent himself/herself from vulnerability to back pain. Beside this concept, competent awareness and knowledge on back ergonomics is vital to protect their back from any traumatic incidents. These ergonomics measures include searching information about the risk factors of back pain, upright sitting posture, bending by bracing from knees, proper pushing/pulling/carrying of objects, and maintaining ideal body posture. Additionally, early diagnosis and management of deconditioning syndrome is also essential to prevent secondary type of back pain. All this should form the foundation for preventing the

development of LBP at individual level. The perception of all these preventive practices should start within each and every individual as a beneficiary of preventing the incidence of back pain in order to become pain free and active for daily life which is necessary for all human being.

❖ Level two: Family/friends level

Understanding the benefits of getting support from other family members, who are living together with the susceptible individual is vital for the prevention of LBP. Further, a person who gets an adequate relaxation time with his/her friends and/or family members is a phenomenal approach that used to create physical, mental and emotional well-being. A person is affiliated to social structures such as the family and the community. Allowing them to express their emotions that may manifest as good or bad feelings within the individual without any violence is important. The person perceives safeguarded when the emotional and/or psychological presence is in a good relationship with the family members and/or friends, regardless of the conditions of physical health. Support getting from family and/or friends provides both a protective and therapeutic effects for LBP.

❖ Level three: Social/community level

Every human being is under continues control over what their community are engaged within and other similar activities that are common among them. There are different types of social gatherings existed inside the community where the study was conducted. In this preventative model, the researcher explored that it is actually the gatherings that determines active involvement of individuals in the social gatherings to the prevention of LBP. Therefore, it is vital to identify gatherings of community that promote active involvement of the participants, which enables individuals to discuss about severity and impacts of LBP, its existed possible prevention mechanisms with their mates, and right and wrong information that other mates have regarding to back pain. This is further strengthened by selecting the best type of convenient transportation system to travel from one place to another.

❖ Level four: Cultural level

Every members of the community are under the regular influence of what they are commonly practicing. This study indicated that the respondents from the survey and the participants

from the interviews perceived that cultural and traditional beliefs influences the development of LBP. In this model, the researcher investigated that there are false traditional insights perceived by the community as a risk factors for back pain that needs mass education programmes. But it is actually the cultural belief system that determines the active involvement of individuals in the prevention LBP. Therefore, it is critical for individuals who will utilise this model to include the cultural belief systems of the community, acknowledge the health promoting aspects of the cultural beliefs, and correct and incorrect information that individuals might have, during implementing the preventative model without hurting the feelings of the individuals. The final rectangle presents the religious practices of the individual. Irrespective of the traditional or cultural affiliations of the person, every human being practices a personal ritual to satisfy the spiritual needs associated with the super-natural God. In the current study, the religious practices commonly practiced by individuals was explored and portrays that individuals with better religious affiliates are more relaxed and getting support from the community. Thus, having good religious' belief is vital to prevent the occurrence of back pain. The main aim of the practitioner who will use this model in the above stated points of the rectangle is to integrate the traditional beliefs, cultural beliefs and religious practices in the prevention of LBP of the community and therefore, promoting a community-based plan within the broader cultural and social contexts for the prevention of LBP is noteworthy.

❖ Level five: Working environment

In acknowledgment of the fact that LBP developed within the bigger context, the final green rectangles demonstrates the working environment of the people. The inclusion of reducing the available workload through different correction measures in the working area presents that LBP can be prevented from this perspective and being satisfied with the current job position is essential to prevent the incidence of work-related LBP. Additionally, avoiding standing for more than half an hour and sitting for more than an hour is beneficiary to prevent themselves from LBP for the working group of the community. On the right side rectangle depicts that the overall working environment should be hostile for all professionals and non-professionals who are actively employed in the working situations. Figure 7.3 underneath outlines a culturally sensitive integrated preventative model as explicated above.

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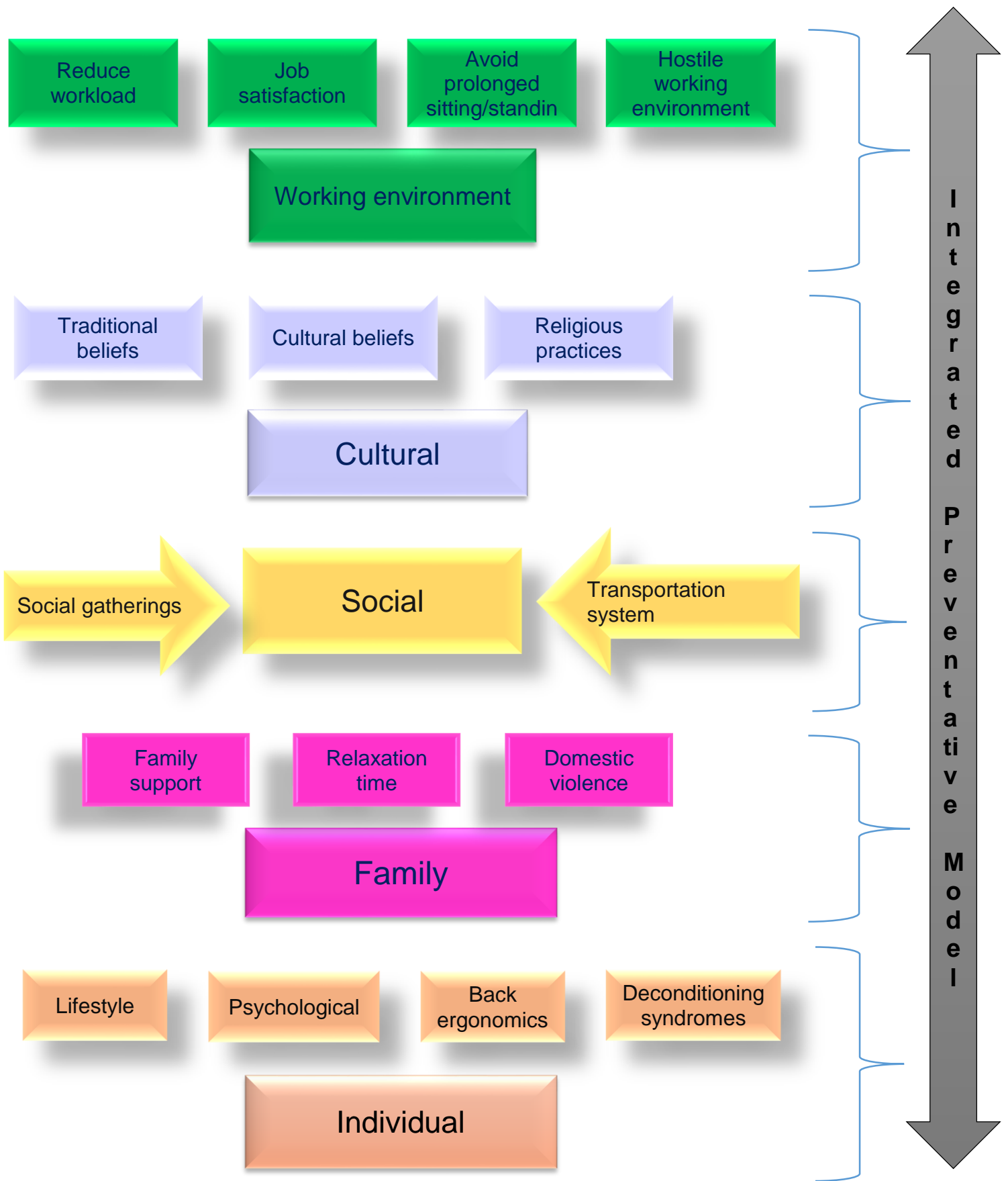
Figure 7.3 Community application of the preventative model

This integrated preventative model is a diagrammatic presentation of cultural dependent modifiable factors emerging through literature review and findings of the study that may influence the development of LBP. It is proposed to use as a brief reference point that offers a means of conceptualising the complex influence of cultural and social factors in vulnerability to LBP. It further assists other researchers to have insights on the modifiable factors which influence the development of LBP. The boxes on the diagram above illustrates various variables that includes clusters with similar concepts.

The model assisted that the components outlined within the model will applicable at the individual, family/friends, community, cultural and social level factors in halting the development of LBP. This model is founded on the findings from both quantitative and qualitative enquires, and thus it is descriptive and explanatory. Therefore, in order to test its explanatory and descriptive value, other researcher should have tested utilising both quantitative and qualitative methods.

7.4.2 Strengths and weakness of the model

The inclusion of both back patients and healthcare providers as the study participants explained the need for the development of prevention model in the community. The developed model is founded on both the bio-medical and culture based risk factors of back pain, thus providing a complex understandings of the gaps in the prevention of LBP. It is also recognised that due to the complexity of the development of LBP, the model does not deliver the exclusive variables that are essential in the management of LBP.

The model however, demonstrated the most fundamental and often health jeopardising behaviours in the prevention of LBP. The researcher also acknowledges that the application of this preventative model depends on the educational and understanding levels of the community. The notable strength of the preventative model is the identification of the culture dependent modifiable risk factors for the development of LBP.

The application of the preventative model as illustrated in figure 7.3 above indicated that prevention starts from the individual level then goes to the next person who is the family or friends, and finally considers the social environments. The strength of the model is therefore to re-emphasise to each healthier individual that they have an obligation as to stick within the health promoting behaviours before they developed the disorder.

The researcher acknowledges that in this study, the behavioural and bio-medical theories provided the theoretical framework, but there is an element of the theory, which was not included in the study. The neuromatrix aspect of the pain theory which includes the cognitive and affective elements of the model involved on the occurrence and persistence of pain. The exclusion of element of the theory allowed the researcher to maintain the focus of the study, but however limited the development of the model to include the effects of the brain on the development of LBP. The incorporation of this element in the study would influence the development of the model. The utilisation of the model with the inclusion of the cognitive element of the neuromatrix theory offers the chance for the scope for future researchers to test the model as a theory for the preventive and therapeutic methods.

7.4.3 Implications for future research

The researcher believes that such type of prevention studies should first focus on the way how the currently available prevention methods are accepted by the community with respect to their knowledge and awareness level. Therefore, preventive researchers should focus on monitoring the effectiveness of available prevention methods consistently. Then after, it will become meaningful to conduct a research to explore modifiable risk factors in order to develop a culturally sensitive preventative model. This will reduce the amount of money spent by sufferers for healthcare utilisations and saved the country's resources spending for the diagnosis, treatment and compensation claims. Therefore, instead of diagnosing with the most expensive imaging techniques or managing with the latest precise treatment strategies, *'prevention is better than cure'*.

The future areas that needs further exploration by other researchers contain but are not limited to the following.

i) This study as of other former studies suffers from lack of standardised instruments but the researcher believes as it contributes invaluable insight as it is guided by models for future inquiries in the research interest.

ii) The researcher believes that further study is required in the study area to identify the determinants for the development of LBP from a population survey through clearly assigning dependent and independent variables. For example, in the current study

the researcher includes different variables that can be measured with the demographic profile of individuals with LBP.

iii) The researcher also believes that culture has a far-reaching influence on many aspects of human behaviour.

iv) The testing of the proposed preventative model is crucial at a larger scale, with differing populations of both healthy and affected individuals and for longer periods of study.

7.5 SUMMARY

This chapter presented the integration phase of the study. It also discussed pertinent findings of the two phases of the study. Furthermore, it also offered detail and wider scope on the dissemination of the study findings and knowledge transfer processes. Finally, the model was developed from the data of the study and literature review and it offered its strengths and weaknesses.

CHAPTER 8

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

The previous three chapters presented the findings of the three phases of the study on the research topic. The chapters assessed the burden of LBP, severity of LBP, associated factors of LBP and impacts of LBP from the findings of quantitative phase of the study. It also explored in-detail, the key bio-medical and cultural modifiable factors of LBP and the influence of cultural beliefs on the development of LBP. The last chapter integrates the quantitative and qualitative findings and informs how the key bio-medical and culture based modifiable risk factors should be used to develop a culturally sensitive preventative model.

This chapter intended to outline the conclusions, limitations and recommendations for the stakeholders to be aware on the new methods used for the prevention of LBP and to contribute preventive strategies for the health of the community and introduce insights for the research area in the future. The main aim of the study was to offer an in-depth exploration of the influence of cultural and social factors in vulnerability to LBP, as a first step towards developing a culturally sensitive integrated preventative model. It was achieved through utilisation of well-developed and clearly stated objectives, which were achieved through employing a sequential explanatory mixed methods research design. The study participants for the survey were aged 18 and above and were back patient. The in-depth interviews were conducted with back patients and healthcare providers.

8.2 RESEARCH DESIGN AND METHOD

This study was a sequential explanatory mixed methods research based on bio-medical and health belief models. It was employed in Addis Ababa public hospitals from August 2018 to August 2019. The first phase of the study was an institution-based cross-sectional survey conducted among aged 18 and above back patients in three public hospitals. The public hospitals were classified into two, notably general hospitals and specialised hospitals. There were 8 general hospitals and 3 specialised hospitals in the study area. The general hospitals were included on the study however, specialised hospitals were excluded from the study due to only offering specialised services such as maternity, psychiatry, Tuberculosis and Leprosy. By using a simple random sampling technique, three public hospitals were included

in the study. From each of the public hospitals, four departments that were related to back pain care (neurology, neurosurgery, orthopaedics and physiotherapy) were selected purposively and the calculated sample size was allocated proportionally. In the study, a total of 170 back patients participated in the study from three public hospitals with a response rate of 99.4%.

A structured, interviewer-administered and close-ended questionnaire was used to generate the data. The numerical data was entered into Epi Info version 3.4.5 software. For cleaning, checking for frequencies and analysis, the data was exported into SPSS version 25 software. At the time of data analysis, descriptive and inferential statistics were computed for the entire group of back patients. A 5% probability level was used for the inferential statistics. The findings showed statistical associations that related to the demographic profiles of back patients. These associations were utilised to design the open-ended questions for the qualitative inquiry.

The qualitative phase of the study was conducted in similar public hospitals to where the quantitative study was conducted. The study involved in-depth interviews and key informant interviews. The participants were back patients who had direct experiences of the phenomena of LBP. Similarly, healthcare providers who had direct communications with back patients and expert clinical knowledge of LBP were included. A total of 18 back patients and 8 healthcare providers were involved in the interviews. Textual data was analysed using Atlas.ti software based on the thematic areas identified from the quantitative findings. Themes that emerged during the analysis period were also incorporated into the final document. The findings from this phase of the study were utilised to widen and deepen the scope of the quantitative findings.

8.3 SUMMARY OF THE RESEARCH FINDINGS

This study sought broadly to address the burden, severity and impacts of LBP and to identify the key bio-medical and cultural factors that supported the development of the culturally sensitive prevention model. In general, this study focused on addressing the following five research questions through blending the quantitative and qualitative inquiries sequentially. The quantitative phase of the study was designed to assess the demographic profile of individuals who presented with LBP and its burden, severity, impacts and associated factors.

The qualitative phase of the study was conducted to explore, in-detail, the bio-medical and cultural factors of LBP and the influence of cultural beliefs on the development of health promoting and health jeopardising behaviours in LBP. Based on the research questions of the study, the findings of both quantitative and qualitative methods were presented as below.

8.3.1 What is the demographic profile of individuals affected by LBP?

The age of respondents ranged from 18 to 81 years, with a mean of 44.35 years and standard deviation ± 14.36 years. Individuals aged between 25-64 account for about 83 per cent of the total individuals affected by LBP. However, gender of individuals affected by LBP did not show considerable difference between male and female individuals. The survey showed that the vast majority i.e. 83.5 per cent of the respondents were Christians. More than half of them were married and nearly three-fourth of them had at least one or more children. More than half of individuals affected by LBP had completed post-secondary education. The proportion of back pain is higher among married individuals and those who had better educational attainment. A majority of the respondents were from the Amhara ethnic group, which was followed by SNNP, Oromo and Tigre. More than half of the participants were homeowners. The majority of them were employed in a formal governmental or informal private sector of the country. However, 32% of back patients were unemployed in a formal governmental or private sectors.

8.3.2 What are the factors associated with the development of LBP?

The lifestyle modifiable risk factors of LBP that showed statistical associations with the demographic profile of individuals with LBP were, gender with exercise habit, age with transportation mode, educational level with choosing mattress and educational level with transportation method. Additionally, the modifiable work-related risk factors that showed statistically significant associations with the demographic profile of individuals with LBP were age with job satisfaction, movement patterns and prolonged sitting; educational level with job satisfaction, workload and working environments; ethnicity with job satisfaction and movement patterns; type of house with prolonged sitting, prolonged standing and movement patterns, and occupation with patterns of movement. Psychosocial modifiable risk factors that showed statistical association with demographic profiles were, age and time for relaxation; religion and attending social gatherings; ethnicity and participating in social life

and type of house with social life. The socio-cultural modifiable risk factors that showed association with the demographic profiles of individuals with back pain were, educational level with accidental falls; age with sedentary lifestyle, overcrowding and using technology; marital status with using technology; ethical background with utilising technology and type of house with life expectations and overcrowding. There was also association between presence of chronic medical illnesses with the respondents age, educational level and duration of LBP. The constructs of HBM that showed a statistical significant association with the demographic profiles of back patients were respondents' age with feeling about self, gender with taking painkillers, financial insecurity, interference of LBP on daily activities and interference of LBP on the daily life; marital status with family support; and educational level with eating a balanced diet, searching information; and finally age with lifting objects.

8.3.3 What is the burden and severity of LBP?

The estimated one-year prevalence of LBP is 31.2 per cent. Almost all of the reported cases of LBP were chronic in nature. Its recurrence rate was also considerably high. The severity of LBP on the VAS ranged from 3-7 (mild to moderate) in the study setting. The commonest impacts of LBP on the sufferers were, pain, healthcare utilisations, taking rest, and poor general health. The study also indicated that individuals with back pain had poor sleeping patterns. Additionally, the study participants mentioned that back pain interfered with their activities of daily living. Moreover, individuals affected by back pain reported that their feelings towards themselves changed after they developed back pain.

8.3.4 What are the bio-medical and culture based modifiable risk factors of LBP?

The bio-medical modifiable factors identified during the survey inquiry were weight, smoking cigarette, drinking alcohol, accident, dealing with life stresses, chronic medical illnesses, poor health status and knowledge on back ergonomics. The cultural factors were sedentary lifestyles, eating habits, physical inactivity, types of bed, types of mattress, transportation mode, overcrowding, utilising technology, life expectations, time for relaxation, family or friend support, familial fighting, following medical orders and attending social gatherings.

8.3.5 How do cultural beliefs influence the development of LBP?

The researcher asked a question to determine how cultural beliefs influenced the development of health promoting and health jeopardising behaviours in LBP. Culture influences all types of behaviours in a positive or negative way. Ethiopia is a multi-cultural nation which has more than 80 ethnic groups. This diverse culture will have a direct or indirect impact on health promoting and jeopardising behaviours commonly practiced by the community. Thus, culture influences the way we eat, attend any type of exercise programme, preferences related to transportation mode and decisions about following medical orders.

8.3.6 What are the key modifiable factors that support the development of model?

The key bio-medical factors that supported the development of the integrated preventative model were deconditioning syndromes, psychological disorders, poor sleeping hygiene and poor knowledge related to back ergonomics. Sedentary lifestyle, soft or hard type of sleeping material, use of poor transportation systems, job dissatisfaction, workload and unsuitable working environments, life expectations, presence of overcrowding, lack of time for relaxation, lack of family support, domestic violence and cultural beliefs:- all of which were seen as cultural factors for the development of the model.

8.4 RECOMMENDATIONS

This study intended to develop a culturally sensitive preventative model to prevent occurrence of LBP through exploring modifiable risk factors of LBP. Based on the pertinent quantitative and qualitative findings, the researcher suggested the following recommendations to prevent the community from back pain.

❖ Development of policy guidelines that guide healthcare providers and other stakeholders on how to prevent the occurrence of LBP in the community.

❖ Development of policies and protocols that guide the identification of low back pain as a disease and that needs critical attention by policy makers, healthcare providers, stakeholders and the community.

❖ Development of policy documents that would guide the communities on how they could prevent themselves from developing back pain.

❖ The healthcare providers should be provided with guidelines that empower them with the ability to identify and direct the community to prevent them from developing back pain.

❖ Development of health promotion groups for individuals who are at risk of developing back pain.

❖ The health promoter groups should identify individuals who are at risk of developing back pain to assist them to be pain free state.

❖ Health promoter groups to identify and direct individuals to adopt various health promoting behaviours to overcome stresses that could progress into back pain.

❖ Finally, the researcher strongly recommends to all stakeholders utilise the proposed preventative model and evaluate its usefulness as a tool for encouraging health promoting behaviours.

8.5 UNIQUE CONTRIBUTION OF THE STUDY

The capacity of the researcher to establish the doctorateness of the study is founded on the unique contributions of the study to the body of knowledge. This section illustrates the unique contributions made by the present study in the prevention of LBP in the public hospital setting. The influence of cultural and social factors in vulnerability to LBP and the development of LBP are both complex phenomena's in the study area. Even though the risk factors of LBP are a research topic that has been comprehensively explored within the literature, the priority was on the culture dependent modifiable risk factors of LBP. Even with the widespread understanding that LBP is not curable with the available western treatment strategies, the healthcare providers remain the primary custodians of the management of LBP and other traditional and spiritual healers serve as the alternative treatment providers. This study confirmed that:

1) The use of explanatory sequential mixed methods, as recommended by previous researchers in the field of LBP, created a potential to predict the burdens of LBP. The initial qualitative enquiry into the range of modifiable risk factors and influence of culture on the development of LBP, provided initial understanding of the phenomenon. These findings cannot be generalised to larger communities. The additional use of the quantitative inquiry in the current study provides the opportunity to generalise the

pertinent findings to the larger population. Thus, the use of both quantitative and qualitative methods maximised the strength of each research approach.

2) In a single study, the collection of qualitative data from back-pain patients and their healthcare providers has not been formerly conducted in the Ethiopian context and this is the first study that included perspectives from the two data-sources.

3) The process of selecting the back patients and healthcare providers from the same public hospitals allowed the researcher to compare the findings directly from the quantitative and qualitative phases of the study. The study participants in the study from the survey and interviews were chosen from the same patient population and working conditions. This consistent process of selecting study participants reduced the dynamics of healthcare circumstances that can be anticipated when the study is employed in diverse cultural areas.

4) Different from the other studies, which only measured the associated risk factors of LBP by utilising back patients only as the study population, the current study utilised both back patients who were attending clinical services at the public hospitals and healthcare providers who were working in these hospitals to share their understanding on the modifiable risk factors of LBP. The utilisation of both these groups in a different phase of the study simplified the differences in the understanding and thoughts on the complex phenomenon of LBP.

5) The sharing of both the bio-medical and culture-based risk factors of LBP from the healthcare providers' perspectives offered them an opportunity to share with their colleagues about how LBP is developed and possible prevention methods for heathier individuals

6) Healthcare workers, as the providers of back care, value the knowledge that they acquire in the process of caring for the back patients. As the healthcare providers shared the lived pain experiences of the back patients, they created awareness among themselves and the community about the burden and possible preventive methods that could be utilised to minimise the occurrence of back pain.

7) Prevention of musculoskeletal disorders in the African context is primarily based on western driven preventive methods. Healthcare providers in the public hospitals are responsible for the delivery of care to patients and educating the community with or without other stakeholders. Different from many countries where LBP is managed by

specialised departments and specialists, the study confirmed the exceptional situation that exists as a result of Ethiopia's culturally and economically different context.

8) The application of the suggested preventative model derived from the findings of the current study can be utilised to prevent the development of back pain among the community. The model could be integrated into the process of solving the challenges linking the decreasing quality of healthcare services as encountered by most responsible stakeholders and the prevention of LBP.

8.6 LIMITATIONS OF THE STUDY

This study encompasses both quantitative and qualitative mixed methods research. This integration assists to complement the two methods and it also supported depth and breadth in the data collected on LBP. However, the study had the following limitations:

❖ The first phase of the study may be liable to social desirability bias due to relying on self-report to generate data. Establishing good rapport with participants and discussing the purpose of the study are typical measures that the researcher relied on to maintain confidentiality.

❖ During data collection, the participants were asked to report historical life events, and this might have been subjected to recall bias.

❖ Difficult to establish temporal relationships due to cross sectional nature of the study.

❖ The data generated in the second phase of the study may be subjected to different interpretation due to the nature of qualitative research.

❖ Since the interpretative nature of the second phase, the researcher might have introduced his bias into the analysis of the findings. To minimise this, transcripts were submitted to the participants to see and correct errors of facts.

8.7 CONCLUSIONS

As indicated in the previous chapters the purpose of this study focussed mainly on developing an integrated preventative model for the prevention of LBP for the community residing in Addis Ababa. Special attention was given to the exploration of the influence of cultural and social factors in vulnerability to back pain from both the perspectives of back patients and healthcare providers. This study was conducted within the context of the public hospitals in Addis Ababa, Ethiopia.

The study was guided by the health belief model that focuses on the exploration of the culture dependent bio-medical and culture-based modifiable risk factors of LBP. The study explored the key bio-medical and culture-based modifiable risk factors in order to develop the model. It provides a wider and broader scope to investigate the phenomenon of LBP. It involved both quantitative and qualitative approaches to draw valid and relevant conclusions on the culture dependent modifiable risk factors of LBP. The quantitative study conducted among back patients provided data on the modifiable risk factors of LBP. It is the fundamental part of the study that provides insights on the development of the preventative model for the prevention of LBP.

The qualitative data collection tool was developed based on the findings from the first phase of the study. In-depth interviews and key informant interviews were both utilised to allow the triangulation of the study findings from the qualitative phase of the study. The results from the qualitative phase of the study further demonstrated that traditional beliefs, cultural beliefs and religious practices are indicated by the respondents as the risk factors for LBP. Importantly, if these factors are incorporated within the elements of the preventative model, then the development of LBP will be prevented effectively.

Both the study and the model represent new knowledge within the Ethiopian context and as such, it is hoped that future research will pursue suggested model modifications. Even though the current study offers new integrated preventative model for the prevention of back pain, it must be acknowledged that this is a sparsely researched area in Ethiopia and there is a need for further studies to be done at the population level.

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ANNEXE A: Curriculum Vitae of the researcher

Mengestie Mulugeta Belay

Mobile: +251912493130

Email: mengestie.mulugeta@aau.edu.et

Personal Data	
Date of Birth	September 22, 1985
Sex:	Male
Marital Status:	Married
Nationality:	Ethiopian

Education	
2016	MPH, General Public Health
	University of Gondar, Gondar, Ethiopia
2011	BSc, Public Health Officer
	Kea-med University College, Addis Ababa, Ethiopia
2007	BSc, Physiotherapy
	University of Gondar, Gondar, Ethiopia

Professional Experience	
10/2007 - 11/2019	Senior Expert Physiotherapist
	Tikur Anbessa Hospital, Addis Ababa, Ethiopia
	Organisation Type: Government- non-profit activities
	Major Duties and Responsibilities:

- Assessing, diagnosis and setting goals for different disorders.
- Prescribing exercises, assistive devices and orthotics for patients who need it.
- Discussion of different cases with other specialists for better treatment outcomes.
- Implementing treatment strategies based on the schedule of the patients.

- Applying electrotherapy machines, performing manipulative procedures, and ordering exercises for patients.
- Responsible for writing up assessment tools and present to the team members.
- Working together with different departments of the hospital in order to deliver a quality care in the field of rehabilitation.
- Writing up referrals for patients who need better evaluation and treatment in other setups.
- Producing regular reports for supervisors.
- Mentoring university students who came from local and international universities.

Training

Oct 2010 – Oct 2012	Advanced Physiotherapy Seminar Series The Jackson Clinics in collaboration with Addis Ababa University, Addis Ababa, Ethiopia
Sep 21 – 23 2010	Ponseti Method of Clubfoot Cure Clubfoot Worldwide, Addis Ababa, Ethiopia
Feb 7 – 9 2008	Neurology for Non-Neurologist Addis Ababa University, Addis Ababa, Ethiopia

Publications

2016	Belay, MM, Worku, A, Gebrie, SA, & Wamisho, BL. 2016. Epidemiology of Low Back Pain among Nurses Working in Public Hospitals of Addis Ababa, Ethiopia. COSECSA/ASEA Publication -East & Central African Journal of Surgery. March/April; 21(1).
2017	Belay, MM, Wamisho, BL, & Gebre, SA. 2017. Doctor of Physiotherapy Program in Ethiopia. Asian Journal of Science and Technology; *08(01) pp.4154-4160.*

ANNEXE B: Ethical clearance certificates from UNISA

UNISA | university of south africa

RESEARCH ETHICS COMMITTEE: DEPARTMENT OF HEALTH STUDIES
REC-012714-039 (NHERC)

1 November 2017

Dear Mengestie Mulugeta Belay

Decision: Ethics Approval

HSHDC/763/2017

Mengestie Mulugeta Belay

Student No 62028383
Supervisor: -Prof T Mgutshini
Qualification: D Litt et phil
Joint Supervisor: -

Name: Mengestie Mulugeta Belay

Proposal An exploration of culture dependent modifiable risk factors for low back pain in Addis Ababa, Ethiopia

Qualification: DPCHS04

Thank you for the application for research ethics approval from the Research Ethics Committee: Department of Health Studies, for the above mentioned research. Final approval is granted from 1 November 2017 to 1 November 2022.

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the Research Ethics Committee: Department of Health Studies on 2 August 2017.

The proposed research may now commence with the proviso that:

1) The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.

2) Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the Research Ethics Review Committee, Department of Health Studies. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.

3) The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.

4) [Stipulate any reporting requirements if applicable].

Note:

The reference numbers [top middle and right corner of this communiqué] should be clearly indicated on all forms of communication [e.g. Webmail, E-mail messages, letters] with the intended research participants, as well as with the Research Ethics Committee: Department of Health Studies.

Kind regards,

Prof JE Maritz
CHAIRPERSON
maritje@unisa.ac.za

Prof MM Moleki
ACADEMIC CHAIRPERSON
molekmm@unisa.ac.za

Prof A Phillips
DEAN COLLEGE OF HUMAN SCIENCES

Approval template 2014

ANNEXE C: Letter of approval from Addis Ababa Regional Health Bureau

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City Government of Addis Ababa Health Bureau

Ref.No. 4/ፐ/ሙ/ 1105/222

Date-19/10/2010

• **Zewditu memorial hospital**
  Addis Ababa

Subject: <u>**Request to access health facility to conduct approved research**</u>

This letter is to support **Mengestie Mulugeta** to conduct research, which is entitled as **"An exploration of culture dependent modifiable risk factors for low back pain in Addis Ababa, Ethiopia."** The study proposal was reviewed and approved by Addis Ababa Health Bureau ethical Clearance Committee, and the investigator is informed with a copy of this letter to report any changes in the study procedures and to submit progressive report once in six months, apply for renewal 30 days prior to the expiry date, and submit technical report within three months of study completion.

Therefore we request the mentioned Facilities and staffs to provide support to the investigator.

With Regards

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Kassayenew Amare
Public Health Research Sub-Process head

cc

• **Mengesti e Mulugeta**
• **Ethical Clearance Committee**
  Addis Ababa

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UNISA | university of south africa

22 JUNE, 2018

UNISA-ET/KA/ST/29/22-06-18

Alert Hospital

Addis Ababa

Dear Madam/Sir,

The University of South Africa (UNISA) extends warm greetings. By this letter, we want to confirm that Mr. Mengistie Mulugeta Belay (student Number: 62028383) is a PhD student in the department of Health Studies at UNISA. Currently, he is at the stage of data collection on his PhD research entitled "**An exploration of culture dependent modifiable risk factors for low back pain in Addis Ababa, Ethiopia.**"

This is therefore to kindly request your assistance in supporting the student in any way that you can. We thank you in advance for the support that would provide to the student.

Sincerely,

Dr. Tsige GebreMeskel Aberra

Deputy Director – Academic and ICT Support

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ANNEXE D: The researcher's application letter to get permission

Date: ___/____/_____

MENGESTIE MULUGETA BELAY
Department of Health Studies
University of South Africa
South Africa
E-mail: 62028383@mylife.unisa.ac.za

**REQUEST FOR PERMISSION TO CONDUCT RESEARCH
IN ADDIS ABABA PUBLIC HOSPITALS**

Dear: _____

My name is **Mengestie Mulugeta Belay** (*Student No. 62028383*) a Doctor student in the departments of Health Studies at the University of South Africa in Pretoria, South Africa. The research I wish to conduct for my Doctoral Thesis entitle "**An Exploration of Culture Dependent Modifiable Risk Factors for Low Back Pain in Addis Ababa, Ethiopia**". This project will be conducted under the supervision of Professor Tennyson Mgutshini, *UNISA, South Africa.*

The study aim is to offer an in-depth exploration of the influence of cultural and social factors in vulnerability to LBP in order to develop a culturally sensitive preventive model: - A case study of Addis Ababa, Ethiopia. I am hereby seeking your consent to review patient's medical documents and collect data on the patients attending clinical follow-up at Orthopaedics, Neurosurgery, Neurology, and Physiotherapy Departments.

I have provided you with a copy of my thesis proposal which includes copies of the proposal documents, information sheet, and a copy of the approval letter which I received from the UNISA Ethics and Higher Degrees Research committee (Human).

Upon completion of the study, I undertake to provide to your Hospital with a bound copy of the full research report. If you require any further information, please do not hesitate to contact me on mobile number: **+251 912 49 3130**,
E-mail: 62028383@mylife.unisa.ac.za.

Thank you for your time and consideration in this matter.

Yours sincerely,
Mengestie Mulugeta Belay

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

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ANNEXE E: Information sheet and consent form: for back patients

Information sheet for "An Exploration of Culture Dependent Modifiable Risk Factors for Low Back Pain in Addis Ababa, Ethiopia: - Developing Integrated Preventative Model".

UNIVERSITY OF SOUTH AFRICA

DEPARTMENT OF HEALTH STUDIES

Name of the principal investigator: Mengestie Mulugeta Belay

Name of the organization: University of South Africa, Department of Health Studies, Pretoria, South Africa.

Name of supervisor: Professor Tennyson Mgutshini

Name of the sponsor: Investigator

Information sheet and consent form prepared for participants of back patients from Addis Ababa Public Hospitals, Addis Ababa, Ethiopia that studies "An Exploration of Culture Dependent Modifiable Risk Factors for Low Back Pain in Addis Ababa, Ethiopia: - Developing Integrated Preventative Model".

Introduction

This information sheet and consent form is prepared by the principal investigator whose main aim is to study "An Exploration of Culture Dependent Modifiable Risk Factors for Low Back Pain in Addis Ababa, Ethiopia: - Developing Integrated Preventative Model". The investigator is a PhD candidate at the University of South Africa, UNISA.

Purpose: The primary purpose of this research is to offer an in-depth exploration of the influence of cultural and social factors in vulnerability to LBP in order to develop a culturally sensitive preventative model: - A case study of Addis Ababa, Ethiopia. This study is designed to develop a cultural sensitive preventative model by exploring bio-medical and socio-cultural modifiable risk factors. The results from this study will be used to assist in making recommendations for those who are responsible to design effective and appropriate measures to prevent low back pain in the general population.

Procedure: In order to assess the "An Exploration of Culture Dependent Modifiable Risk Factors for Low Back Pain in Addis Ababa, Ethiopia: - Developing Integrated Preventative Model", the researcher invite you to take part in the project. If you are willing to participate in the project, you need to understand and sign the consent form. Then, you will be asked to give your response by data collector. For this questionnaire-based study, participants are back-patients who are attending outpatient follow-up clinics from Orthopaedics, Neurosurgery, Neurology, and Physiotherapy Departments during the study period. All the responses given by the participants and the results obtained will be kept anonymous and confidential using coding system; whereby no one will have access to your responses.

Risk and/or discomfort: by participating in this research project you may feel that it has some discomfort specially on wasting your time (about 20-25 minutes). But this may not be too much as you are going to health institutions for you and your family health care and comparing its potential benefits it contributes to the overall improvement of the health status of the community. There is no risk in participating in this research project.

Benefits: if you participate in this research project, you may not get direct benefits, but your participation is likely to help us in the development of a cultural sensitive preventative model that will be used to prevent occurrence of Low Back Pain.

Finally, it will give and insight whether treatment strategy is adequate and preventive measures are required or not based on the findings of the study for improving the health status of the community.

Incentives: you will not provide any incentives to take part in this project.

Confidentiality and anonymity: the information that we will collect from this research project will be kept confidential. Information about you that will be collected from study will be stored in a file, which will not have your name on it, but a code number assigned to it. Which number belongs to which name will be kept under lock and key, and it will not be revealed to anyone except the principal investigator.

Right to refuse or withdraw: you have full right to refuse from participating in this research (you can choose not to respond some or all of the questions). If you do not wish to participate; this will not affect your services, you obtained in the hospital. You have also the full right to

withdraw from this study at any time you wish to, without losing any of your rights as a patient in each follow-up clinics.

Persons to contact: If you have any questions you can contact the following person and you may ask at any time you want.

1. Mengestie Mulugeta Belay: University of South Africa, South Africa.

   Mobile number: +251 912 493130 or e-mail: 62028383@mylife.unisa.ac.za

If you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please

Contact:

2. Professor Tennyson Mgutshini

   Professor in Public Health

   Department of Health Studies

   College of Human Sciences

   University of South Africa

   Email: Mgutst@unisa.ac.za

ANNEXE F: Consent form for back patients (for the quantitative phase of the study)

My name is _____. I am working in the research team of University of South Africa. This project is conducted by Mengestie Mulugeta Belay (Student No. 62028383) a PhD candidate at the University of South Africa, UNISA. The aim of this study is to offer an in-depth exploration of the influence of cultural and social factors in vulnerability to LBP in order to develop a culturally sensitive integrated preventative model: - A case study of Addis Ababa, Ethiopia. You are chosen to participate in the study by chance. The purpose of this study is to generate information about low back pain among population in Addis Ababa, which may help the policymakers, stakeholders and the community to take actions based on the findings. The researcher requesting your help with your honest and genuine participation by responding to the questions prepared is highly appreciated and credited.

Confidentiality and consent: The researcher will use a structured questionnaire developed based on the six constructs of health belief model to record your information. There is no any harm participating on this investigation. The study will include various intimate and private life questions in order to effectively achieve the objectives of the research. The researcher does not put your name on the questionnaire, and no individual response will be reported. Your response will be kept completely confidential. It is your full right to refuse in responding any question. If you do not want to participate you can leave responding to the questionnaire. However, your honest answers to these questions will help us in better understanding of the demographic profile of individuals affected by LBP, to identify factors associated with the development of LBP, ascertain the prevalence and severity of LBP, assess the influence of cultural beliefs on LBP among back patients, and to explore culture-based and bio-medical modifiable risk factors of LBP. So, the researcher requesting you to give your honest response and keep participating. It will take a maximum of 10-15 minutes to answer these questions.

Would you be willing to participate in this study?   Yes   ☐   No   ☐

Signature of the participant_____

Signature of the data collector: _____   Date: ___/___/_____

ANNEXE G: Minimum variables extracted from back patients' medical records

1. Name of Health Institution: _____

2. Medical Record Number: _____

3. Age: _____

4. Sex: _____

5. Address: _____

6. Chief Complaints: _____

   _____

   _____.

7. Pertinent Laboratory Results (if any): _____

   _____

   _____

   _____.

8. Ultrasound Report (if any): _____

   _____

   _____.

9. X-ray Result (if any): _____

   _____

   _____.

10. MRI/CT Scan Interpretation (if any): _____

    _____

    _____.

11. Diagnosis: _____

    _____.

12. Treatment Plan: _____.

13. Other Comorbidities (Hypertension, Diabetes Mellitus, *etc…*) _____

    _____

    _____.

ANNEXE H: Survey questionnaire for back patients

1. Socio-Demographic Factors   Date: ___/___/_____

                                                    Medical Record Number: _____

    1.   Age (years): _____

    2.   Gender: Male ☐   Female ☐

    3.   Religion: Orthodox ☐   Muslim ☐   Protestant ☐   Other ☐

    4.   Marital status: Single ☐   Married ☐   Divorced ☐ Widowed ☐

    5.   Number of children (if any): _____

    6.   Educational level: None ☐ Primary ☐ Secondary ☐ High school/above ☐

    7.   Ethnicity: _____

    8.   Type of house used to live: Own ☐   Rent ☐

    9.   Monthly income in Ethiopian birr: _____

    10.   Area of living: Rural ☐   Urban ☐

    11.   Occupation: _____

    12.   Home-made activities: _____

2. General Information about Low Back Pain

    2.1. Previous history of LBP: Yes ☐   No ☐

    2.2. How many episodes: 1 ☐   2 ☐   more than two ☐

    2.3. How long ago first attack in months: _____

    2.4. Recovery from last previous episode: complete ☐ residual pain ☐

    2.5. Previous diagnostics: X-ray ☐ CT Scan ☐   MRI ☐   None ☐

    3.6 Previous treatment: _____ Not treated ☐

  anti-pain medication ☐   physical therapy ☐   spinal injection ☐   surgery ☐

    2.7. History of injury/trauma: Yes ☐   No ☐

    2.8. Diagnosis as LBP: _____

    2.9. Duration of LBP: <6 weeks ☐   6-12 weeks ☐ >12 weeks ☐

    2.10. Onset of LBP: Sudden ☐   Gradual ☐   No response ☐

    2.11. Any type of chronic medical illness?   Yes ☐ No ☐

    2.11*a*. Diabetes Mellitus: Yes ☐   No ☐

    2.11*b*. Hypertension: Yes ☐   No ☐

    2.11*c*. Arteritis of multiple joints: Yes ☐   No ☐

2.11*d.* Chronic Kidney Diseases: Yes ☐   No ☐

2.11*e.* Irregular Menstrual cycle/taking contraceptive: Yes ☐   No ☐

2.11*f.* Osteoporosis: Yes ☐   No ☐

2.11*g.* Hypothyroidism/Hyperthyroidism: Yes ☐   No ☐

2.11*h.* Number of pregnancy: _____

2.11*i.* Other: _____

3. Lifestyle Factors

   3.1. Height (meter): _____

   3.2. Weight (kilogram): _____

   3.3. Smoking: Non-smoker ☐   Smoker ☐

   3.4. Alcohol: Non-drinker ☐   Drinker ☐

   3.5. Exercise habit: Good habit ☐   Poor habit ☐

   3.6. What type of sleeping material do you used to sleep?

   Mattress/ foam ☐   Bare floor ☐   Bed ☐

   3.7. What type of mattress do you used to sleep?

   Soft ☐   Firm ☐   Orthopaedics ☐   Other: _____

   3.8. For how long did you sleep per night in average (hours)? _____

4. Work-Related Factors

   4.1. Lifting greater than 10kg (heavy load):   Yes ☐   No ☐

   4.2. Sitting for more than half an hour (prolonged sitting): Yes ☐   No ☐

   4.3. Standing for more than an hour (prolonged standing): Yes ☐   No ☐

   4.4. Do you have sustained work load on you working area: Yes ☐ No ☐

   4.5. Does your work require body posture like twisting, bending, and over reaching?

   Yes ☐   No ☐

   4.6. Does your work needs any of the following movement patterns? None ☐
   pushing or pulling ☐   vibration ☐   lifting of weights ☐   kneeling/squatting ☐

5. Psychosocial Factors

   5.1. Do you have time for relaxation?   Yes ☐   No ☐

5.2. Can you able to attend any type of social programs? Yes ☐ No ☐

5.3. How much are you satisfied with your job?

Very dissatisfied ☐   Somewhat dissatisfied ☐   Neutral ☐

Somewhat satisfied ☐   Very satisfied ☐

5.4. Do you feel depressed or hopeless that the situation cannot improve?

Yes ☐   No ☐

5.5. Do you feel that your job is the main cause of your pain? Yes ☐ No ☐

5.6. Do you think that an accident is the main cause of your pain? Yes ☐ No ☐

5.7. Do you find it hard to deal with the stress of everyday life due to your pain?

Yes ☐   No ☐

6. Severity of Low Back Pain on Visual Analogue Scale (0-10 scales)

6.1. Most of the time my pain is currently score: _____

6.2. The worse pain I have or had was score: _____

6.3. The least pain I have or had was score: _____

7. The Impacts of Low Back Pain

7.1. Modified profession: Yes ☐   No ☐

7.2. Changed working setting: Yes ☐   No ☐

7.3. Restricted activities: Yes ☐   No ☐

7.4. Sick leave: Yes ☐   No ☐ If yes number of days: _____

7.5. Health care utilization: Clinics ☐   Hospital ☐   Other: _____

7.6. In general, would you say your health is?

Excellent ☐ Very Good ☐   ☐   ☐ or ☐

8. Socio-Cultural Factors

8.1. Do you think that your culture caused your pain? Yes ☐ No ☐

8.2. Do you think that using technology caused your back pain? Yes ☐ No ☐

8.3. Are your expectations in line with your life? Yes ☐ No ☐

8.4. Do you think that your beliefs might prone to LBP? Yes ☐   No ☐

8.5. Is there any over-crowding around your village?   Yes ☐   No ☐

8.6. What type of transportation method do you used? Taxi ☐ Bus ☐ Both ☐

Other: _____

8.7. Have you lost your job?   Yes ☐   No ☐

8.8. Are you in a romantic relationship?   Yes ☐   No ☐

8.9. Is there any familial fighting at your home?   Yes ☐   No ☐

8.10. How is your working environment looks like? _____

8.11. What advices do you get from the healthcare providers? _____

_____.

8.12. What do you learn from low back pain? _____

_____

_____.

	9. Health Belief Model Questionnaire Items and Factors					
	A) Perceived Susceptibility	Strongly Agree	Agree (4)	Neither agree Nor disagree (3)	Disagree (2)	Strongly
A1	My chance of getting recurrent low back pain is high.					
A2	My physical health prone me to have low back pain.					
A3	I feel that my chances of having low back pain in the future is high.					
A4	There is a good possibility to develop low back pain.					
A5	I worried a lot before having Low back pain.					
A6	Within the next year, I will get recurrent low back pain.					
A7	My life style made me to develop low back pain.					
A8	I believed that movement will further aggravate low back pain.					
	B) Perceived Severity Question Items					
B1	The information I heard about low back pain scared me.					
B2	When I think about my pain, my health is declining.					
B3	Low back pain is an incurable disease.					
B4	My feelings about myself changed after I have low back pain.					
B5	I am afraid to think about my low back pain.					
B6	My financial security has been endangered after I developed LBP.					
B7	Low back pain prone me to have different problems.					
B8	Low back pain is more serious than other diseases.					
B9	After I had low back pain, my whole life was changed.					
B10	My low back pain is getting worse from time to time.					
C1	Doing physical exercise prevents future complications of LBP.					
C2	Medical treatments is effective in reducing symptoms from the effects of LBP.					

C3	Taking medicines are ineffective in preventing illness from the effect of LBP.					
C4	Eating traditional diets prevents occurrence of LBP.					
C5	Avoiding alcohol can help to reduce the occurrence of LBP.					
C6	Avoiding cigarette can help to reduce the occurrence of LBP.					
	D) Perceived Barriers Question Items					
D1	It is embarrassing for me to go for an exercise program.					
D2	In order to get medical treatment, I have to give up quite a bit.					
D3	My family/ friends would make fun of me when I talked about LBP.					
D4	Low back pain interferes with my activities.					
	E) Cues to Action Question Items					
E1	I eat a well-balanced diet.					
E2	I keep my Ideal body weight.					
E3	I exercise at least three times a week.					
E4	I follow medical orders because they have benefit for my health.					
E5	I do things frequently to improve my health.					
E6	I take vitamins and minerals when I do not eat good meals.					
E7	I am adequately sleeping.					
E8	I am avoiding getting tense and anxious.					
E9	I search for new information related to my health.					
E10	Mostly I sit in upright posture.					
F1	I have done an exercise program for the past one year.					
F2	I have done an exercise program in the past 3 months.					
F3	I have done an exercise program in the past 1 month.					
F4	I feel safe about my back if I lift objects with great precaution.					
F5	I know how to lift objects properly by using body mechanics.					
F6	I could lift objects by bracing from my knee.					
F7	I attend religious ceremonies.					

ANNEXE I: The final version of the survey questionnaire

The final version of the questionnaire was done after computing Cronbach's alpha test. The questions which scored 0.75 and above were included in the final version of the questionnaire list. The final SPSS output of the Cronbach's alpha analysis is presented in the following table.

Reliability Statistics	
Cronbach's Alpha	Number of Items
0.884	**76**

Number	Question Items or Variables	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1	Gender	194.88	471.554	.529	**.882**
2	Religion	194.88	483.554	-.053	**.886**
3	Marital Status	194.50	485.429	-.144	**.886**
4	Having children	195.13	482.411	.000	**.884**
5	Number of Children	192.88	512.125	-.430	**.897**
6	Educational Level	192.88	484.696	-.089	**.886**
7	Type of House	194.63	480.554	.067	**.885**

8	Job Satisfaction	194.88	477.839	.132	**.884**
9	Smoking	196.13	482.411	.000	**.884**
10	Exercise Habit	195.13	482.411	.000	**.884**
11	Frequency of Exercise	192.00	482.000	-.038	**.892**
12	Type of Mattress	194.50	471.714	.464	**.882**
13	Duration of Sleep	189.75	475.357	.128	**.885**
14	Onset of LBP	194.75	481.357	.035	**.885**
15	History of Chronic Illnesses	195.25	481.929	.023	**.885**
16	Heavy Load	195.63	472.554	.412	**.882**
17	Prolonged Sitting	195.25	482.214	.005	**.885**
18	Prolonged Standing	195.63	469.696	.536	**.882**
19	Suitable Working Environment	194.38	481.125	.053	**.885**
20	Does your work needs any movement patterns?	195.13	482.411	.000	**.884**
21	Time for relaxation	196.00	483.429	-.074	**.885**
22	Attend social programs	195.13	482.411	.000	**.884**
23	Feel depressed or hopeless	195.63	481.982	.006	**.885**
24	Accident is the main cause of pain	195.50	486.000	-.169	**.886**
25	Most of the time my pain is scored	191.13	484.411	-.097	**.886**
26	The worse pain I have or had was score	188.75	444.500	.443	**.881**
27	The least pain I have or had was score	191.00	447.429	.330	**.885**
28	Restricted activities	194.75	481.357	.035	**.885**
29	Changed working setting	194.50	471.714	.464	**.882**
30	Taking rest due to LBP	195.63	469.982	.524	**.882**

31	Health care utilization	195.13	482.411	.000	**.884**
32	Do you think that using technology caused your back pain?	196.00	480.000	.148	**.884**
33	Are you living the way you want to live (expectations)?	196.00	483.143	-.055	**.885**
34	Do you think that your beliefs might prone to LBP?	196.13	482.411	.000	**.884**
35	Is there any over-crowding around your village?	195.38	483.125	-.046	**.885**
36	Is there any familial fighting at your home?	196.00	480.000	.148	**.884**
37	My physical health prone me to have low back pain.	193.00	445.143	.532	**.879**
38	There is a good possibility to develop low back pain.	191.88	449.839	.717	**.877**
39	I worried a lot before having Low back pain.	193.00	454.286	.455	**.881**
40	My chance of getting recurrent low back pain is high.	192.25	451.929	.546	**.879**
41	My feelings about myself changed after I have low back pain.	191.88	468.411	.688	**.881**
42	After I had low back pain, my whole life was changed.	191.88	469.839	.616	**.881**
43	My low back pain is getting worse from time to time.	192.38	471.982	.158	**.885**

44	When I think about my pain, my health is declining.	191.63	469.696	.536	**.882**
45	Low back pain is more serious than other diseases.	191.88	465.268	.546	**.881**
46	Low back pain is an incurable disease.	193.25	444.786	.626	**.878**
47	Low back pain prone me to have different problems.	192.25	465.357	.376	**.882**
48	My financial security has been endangered after I developed LBP.	192.88	474.411	.100	**.886**
49	The information I heard about low back pain scared me.	192.50	465.429	.272	**.883**
50	I am afraid to think about my low back pain.	192.25	455.071	.441	**.881**
51	Eating traditional diets prevents occurrence of LBP.	192.38	445.411	.822	**.876**
52	Avoiding alcohol can help to reduce the occurrence of LBP.	192.75	456.786	.363	**.882**
53	Avoiding cigarette can help to reduce the occurrence of LBP.	192.38	446.839	.626	**.878**
54	Medical treatments is effective in reducing symptoms of LBP.	191.38	470.554	.580	**.882**
55	Taking pain-killers are effective in preventing illness from LBP.	192.00	470.857	.745	**.882**

56	Doing physical exercise prevents future complications of LBP.	191.63	470.839	.487	**.882**
57	It is embarrassing for me to go for an exercise program.	193.38	441.696	.664	**.877**
58	Getting medical treatment is hard for me.	192.63	466.268	.255	**.884**
59	My family/ friends would make fun of me when I talked about LBP.	192.63	463.411	.279	**.883**
60	Low back pain interferes with my activities.	192.00	447.429	.811	**.877**
61	I eat a well-balanced diet.	192.50	454.571	.591	**.879**
62	I take vitamins and minerals when I do not eat good meals.	193.13	446.982	.559	**.879**
63	I follow medical orders to improve my health.	191.63	467.982	.612	**.881**
64	I am avoiding getting tense and anxious.	192.38	476.268	.138	**.884**
65	I search for new information related to my health.	191.75	467.357	.661	**.881**
66	Mostly I sit in an upright posture.	192.50	454.571	.591	**.879**
67	I have done an exercise program three times a week.	192.13	450.125	.800	**.877**
68	I feel safe about my back if I lift objects with great precaution.	192.13	473.554	.368	**.883**
69	I know how to lift objects properly by using body mechanics.	192.00	470.857	.745	**.882**
70	I attend religious and social ceremonies.	191.88	468.411	.688	**.881**

ANNEXE J: The Amharic version of the survey questionnaire

ክፍል 1፡ አጠቃላይ መረጃ   ቀን፡ ____/____/_____

የህክምና ካርድ ቁጥር: _____

101. እድሜ (በዓመት): _____

102. ፆታ፡   ወንድ ☐   ሴት ☐

103. ሃይማኖት፡ አርቶዶክስ☐   ሙስሊም☐   ፕሮቴስታንት☐   ሌላ ☐

104. የጋብቻ ሁኔታ፡ ያላገባ/ች☐   ያገባ/ች ☐   የፈታ/ች ☐   የሞተበት/ባት ☐

105. ልጅ አለዎት?   አዎ ☐   የለኝም ☐

106. መልስዎት አዎ ከሆነ ስንት ልጅ/ልጆች አለዎት? _____

107. የትምህርት ደረጃ፡ ምንም ☐   ከ1ኛ እስከ 4ኛ ☐   ከ5ኛ እስከ 8ኛ ☐   9ኛና ከዛ በላይ ☐

108. ብሔርዎት: _____

109. የሚኖሩበት ቤት: የግል ☐   ኪራይ ☐

110. ወርሃዊ ገቢያ በብር ምን ያህል ይሆናል? _____

111. ስራዎት ምንድን ነው? _____

112. በሚሰሩት ስራ ደስተኛ ነዎት?   አዎ ☐   አይደለሁም ☐   መልስ የለም ☐

ክፍል 2፡ የሕይወት ዘይቤ ምክንያቶች

201. ቁመት (በሜትር)፡ _____

202. ክብደት (በኪሎ-ግራም) ፡ _____

203. ሲጋራ ያጨሳሉ? አላጨስም ☐   አጨሳለሁ ☐

204. መጠጥ ይጠጣሉ?   አልጠጣም ☐   እጠጣለሁ ☐

205. ስፖርት ይሰራሉ? እሰራለሁ ☐   አልሰራም ☐   አልሰራም ካሉ ወደ ቀጣዩ ጥያቄ ይለፉ

206. ከሰፉ በሳምንት ለምን ያህል ቀናቶች ይሰራሉ? _____

207. ለመተኛነት የሚጠቀሙት?   አልጋ ☐   ወለሉ ላይ ፍራሽ አንጥፈው ☐   ሌላ ☐

208. የሚጠቀሙት ፍራሽ ምን አይነት ፍራሽ ነው?   ለስላሳ ☐   ጠንካራ ☐   ሌላ ☐

209. በአማካይ ለምን ያህል ሰዓት ይተኛሉ? _____

210. ለትራንስፖርት የሚጠቀሙት?

        ታክሲ ☐   አውቶብስ ☐   ሁለቱንም ☐   የግል መኪና ☐   ሌላ ☐

ክፍል 3፡ ስለ ወገብ ህመም ጠቅላላ መረጃዎች

301. ካሁን በፊት የወገብ ሕመም አሞዎት ያውቃል? አዎ   ኣያውቅም ☐   ☐

302. የወገብ ሕመም ከጀመረዎት ስንት ጊዜ ሆነ? _____

303. የወገብ ሕመሙ የተከሰተበዋት: ባጋጣሚ/ቢድንገት ☐   ቀስ በቀስ ☐   መልስ የለዋትም ☐

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304. ጉዳት ወይም አደጋ አጋጥሞዎት ያውቃል?   አዎ ☐   አያውቅም ☐

305. ሌላ አይነት ህመም አለበዎት? አዎ ☐   የለብኝም ☐   የለብኝም ካሉ ወደ ክፍል 4 ይለፉ

306. ካለብዎ ምን አይነት የቆየ ሕመም/በሽታ/ አለበዎ (ለምሳሌ:- የደም ግፊት፤ ስኳር፤)?

_____

ክፍል 4: ከሥራ ጋር ተዛማጅ ምክንያቶች

401. ከባድ እቃ (ከአስር ኪሎ በላይ) ያነሳሉ?   አነሳለሁ ☐   አላነሳም ☐

402. ከግማሽ ሰዓት በላይ ይቀመጣሉ? እቀመጣለሁ ☐   አልቀመጥም ☐

403. ከአንድ ሰዓት በላይ ይቆማሉ?   አዎ ☐   አልቆምም ☐

404. በስራ ቦታ ወይም ከቤት ከባድ ስራ ይሰራሉ?   አዎ ☐   አልሰራም ☐   መልስ የለም ☐

405. የስራ ቦታዎት ለእርስዎ የተመቻቸ ነው?   አዎ ☐   አይደለም ☐   መልስ የለም ☐

406. የሚሰሩት ስራ መዘር፤ ማጎንበስ፤ ወይም ቀና እንድሉ ያደርገዎታል? አዎ ☐   አያደረገኝም ☐

መልስ የለም ☐

407. ስራዎት የሚከተሉትን የሰውነት እንቅስቃሴዎች ይፈልጋል ወይስ አይፈልግም? (ከአንድ

በላይ መምረጥ ይቻላል)

አይፈልግም ☐   መገፋት/መሳብ ☐   እንቅጥቃጤ አለው ☐

ከባድ እቃ ማንሳት ☐   በጉልበት መንበርከክ ☐   ሌላ ☐   መልስ የለም ☐

ክፍል 5: ሥነ-ልቦናዊና ማህበራዊ ምክንያቶች

501. ለመዝናናት በቂ ጊዜ አለዎት? አዎ ☐   የለኝም ☐

502. ማህበራዊ ፕሮግራሞችን (በዓላት፤ እድር ወይም እቁብ) ይሳተፋሉ? አዎ ☐   አልሳተፍም ☐

503. የወገብ ሕመሙ ሲባስብዎት የማዘን ወይም ተስፋ የመቁረጥ ስሜት ይሰማዎታል?

አዎ ☐   አይሰማኝም ☐

504. የሚሰሩት ስራ ለወገብ ሕመም ያጋለጠዎ ይመስለዎታል? አዎ ☐   አይመስለኝም ☐   መልስ የለም ☐

505. ለወገብ ሕመም ያጋለጠኝ አደጋ ነው ብለው ያምናሉ?   አዎ ☐   አይመስለኝም ☐

506. የወገብ ሕመም ከጀመረዎ ጀምሮ የቀን ተቀን የህይወት ቸናዎችን መቋቋም አቅቶዎታል?

አዎ ☐   አላቃተኝም ☐

ክፍል 6: የወገብ ሕመም ከ0-10 ባለው ልኬት መሰረት የተመለከቱ መጠይቆች

ይህ መለኪያ ከዜሮ እስከ አስር ባለት ቁጥሮች መሰረት የሚለካ ሲሆን ዜሮ ማለት ምንም አይነት ሕመም አይሰማዎትም ማለት ሲሆን አስር ማለት ደግሞ እጅግ በጣም ከፍተኛ ሕመም ይሰማዎታል ማለት ነው። አምስት ደግሞ መካከለኛ ሕመም መኖሩን ያመለክታል። በመካከልም ሌሎች ቁጥሮች አሉ። በዚህ መሰረት የእርስዎን ሕመም ይነፋሩኛል።

601. በአብዛኛው ጊዜ የወገብ ሕመምዎ ስንት ይሆናል? _____

602. በጣም ከባድ ሕመም የነበረዎ ስንት ነበር? _____

603. በጣም ቀላል ሕመም የነበረዎ ስንት ነበር? _____

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ክፍል 7፡ የወገብ ሕመም ያስከተላቸው ተፅዕኖዎች

701. በወገብ ሕመም ምክንያት የሚሰሩትን ስራ ቀንሰዋል? አዎ ☐ አልቀነስኩም ☐ መልስ የለም ☐

702. በወገብ ሕመም ምክንያት የሚሰሩበትን የስራ ቦታ ቀይረዋል? አዎ ☐ አለቀየርኩም ☐

መልስ የለም ☐

703. በወገብ ሕመም ምክንያት ተደጋጋሚ እረፍት ያድረጋሉ? አዎ ☐ አላደርግም ☐

704. በወገብ ሕመም ምክንያት ለተደጋጋሚ ጊዜ ህክምና ቦታ ሄደዋል? አዎ ☐ አልሄድኩም ☐

705. በአጠቃላይ ጤናዎ ምን ይመስላል?

እጅግ በጣም ጥሩ ☐ በጣም ጥሩ ☐ መጠነኛ ☐ ያልተሟላ ☐

ክፍል 8፡ ከባህል ጋር ተዛማጅ ምክንያቶች

801. ለኑሮ የሚከተሉት የኢኮኖሚ ዘይቤ ለወገብ ሕመም ያጋልጣል ብለው ያምናሉ?

አዎ ☐ አላምንም ☐

802. ዘመን አመጣሽ ቴክኖሎጂ መጠቀም ለወገብ ሕመም ያጋልጣል ብለው ያምናሉ?

አዎ ☐ አላምንም ☐

803. ኑሮን እንዳሰቡት ሁነው እየኖሩ ነው? አዎ ☐ አይደለም ☐

804. ለወገብ ሕመም ያጋለጠኝ የምከተለው እምነት ነው ብለው ያምናሉ?

አዎ ☐ አላምንም ☐

805. በሚኖሩበት አካባቢ የሰውም ይሁን የሌላ ነገር መጨናነቅ አለ? አለ ☐ የለም ☐

806. በሚኖሩበት ቤት ተደጋጋሚ የሆነ አለመግባባት/ግጭት ይከሰታል?

አዎ ☐ አይከሰትም ☐

	ክፍል 9. የጤና አመለካከት ሞደል ጥያቄዎች	በጣም አስማማለሁ (5)	አስማማለሁ (4)	ገለልተኛ (3)	አልስማማም (2)	በጣም አልስማም (1)
	ሀ) ለወገብ ሕመም ተጋላጭነትን ስለመገንዘብ					
A1	ደካማ የሆነ አካላዊ ጤና ለወገብ ሕመም አጋለጦኛል፡፡					
A2	በወገብ ሕመም ለመያዝ ጥሩ አጋጣሚዎች አሉ፡፡					
A3	የወገብ ሕመም ሳይዘኝ ብዙ እጨነቅ ነበር፡፡					
A4	ተደጋጋሚ ለሆነ የወገብ ሕመም ተጋላጭነቴ ከፍተኛ ነው፡፡					
A5	ማንኛውም አይነት እንቅስቃሴ የወገብ ሕመምን ያባብሳል፡፡					
	ለ) የወገብ ሕመም ከባድነትን ስለመገንዘብ					
B1	የወገብ ሕመም ከጀመረኝ ጀምሮ ስለ ራሴ ያለኝ አመለካከት ተቀይሯል፡፡					
B2	የወገብ ሕመም ከጀመረኝ በኋላ በአጠቃላይ ሕይዋቴ ተቀይሯል፡፡					
B3	የወገብ ሕመሜ ከጊዜ ወደ ጊዜ እየባሰ ነው፡፡					
B4	ስለ ሕመሜ ሳስብ ጤናየ እየቀነሰ እንደሆነ ይሰማኛል፡፡					
B5	የወገብ ሕመም ከሌሎች በሽታዎች አንጻር በጣም የከፋ ነው፡፡					
B6	የወገብ ሕመም የማይድን በሽታ ነው፡፡					
B7	የወገብ ሕመም ለተለያዩ ችግሮች አጋልጦኛል፡፡					
B8	የወገብ ሕመም ከጀመረኝ ጊዜ ጀምሮ የገቢ ምንጩ ቀንሷል፡፡					
B9	ስለ ወገብ ሕመም የምሰማው መረጃ ያስፈራኛል፡፡					
B10	ስለ ወገብ ሕመም ማሰብ ያስፈራኛል፡፡					
	ሐ) የወገብ ሕመም የመከላከል ጥቅምን ስለማወቅ					
C1	ባህላዊ ምግቦችን መመገብ የወገብ ሕመምን ይከላከላል፡፡					
C2	አልኮል አለመጠጣት ለወገብ ሕመም ተጋላጭነትን ይቀንሳል፡፡					
C3	ሲጋራ አለማጨስ ለወገብ ሕመም ተጋላጭነትን ይቀንሳል፡፡					
C4	በወገብ ሕመም የሚከሰቱ ምልክቶችን ለመቀነስ ሕክምና ውጤታማ ነው፡፡					
C5	የሕመም ማስታገሻ መውሰድ የወገብ ሕመምን ይቀንሳል፡፡					

C6	ከወገብ ሕመም ጋር ተያይዘው የሚከሰቱ ችግሮችን ለመከላከል ስፖርታዊ እንቅስቃሴ ይጠቅማል፡፡					
	መ) ተግዳሮቶችን ስለመገንዘብ	በጣም እስማማለሁ (5)	እስማማለሁ (4)	ግልተኛ (3)	አልስማማም (2)	በጣም አልስማማም (1)
D1	ለእኔ ስፖርታዊ እንቅስቃስ ማድረግ አስቸጋሪ ነው፡፡					
D2	ለእኔ ሕክምና ማግኘት ወጭው ከባድ ነው፡፡					
D3	ስለወገብ ሕመሜ ለቤተሰቦቸ ሳወራቸው ብዙም ትኩረት አይሰጡኝም፡፡					
D4	የወገብ ሕመም የቀን ተቀን እንቅስቃሴዬ ላይ ተፅእኖ አሳድሮብኛል፡፡					
	ሠ) የመከላከል መንገዶችን ስለማወቅ					
E1	የተመጣጠነ ምግብ እመገባለሁ፡፡					
E2	በቂ ያልሆነ ምግብ ካልተመገብኩ ቫይታሚን ወይም ማዕድን እወስዳለሁ፡፡					
E3	የሰውነት ክብደቴን እቆጣጠራለሁ፡፡					
E4	ጤንነቴን ለማሻሻል የህክምና ትዕዛዞችን እከተላለሁ፡፡					
E5	በተቻለ መጠን የስራ ውጥረትንና ጭንቀትን እቀንሳለሁ፡፡					
E6	ከጤና ጋር የተገናኙ አዳድስ መረጃዎችን እፈልጋለሁ፡፡					
E7	በአብዛኛው ጊዜ ከደረቴ ቀና ብዬ እቀመጣለሁ፡፡					
	ረ) ግላዊ የመከላከያ ዘዴዎችን ስለማወቅ					
F1	ስፖራታዊ እንቅስቃሴ በሳምንት ለሶስት ቀናቶች እሰራለሁ፡፡					
F2	እቃ ለማንሳት ለሰውነት የሚደረግ ጥንቃቄን አውቃለሁ፡፡					
F3	እቃን በጥንቃቄ ካነሳሁ ወገቤ ሰላማዊ እንደሚሆን አውቃለሁ፡፡					
F4	ከጉልበቴ በርከክ በማለት እቃዎችን ማንሳት እችላለሁ፡፡					
F5	ሃይኖታዊ በዓላትንና ማህበራዊ አገልግሎቶችን እሳተፋለሁ፡፡					

ANNEXE K: Information sheet for the in-depth interview participants: for back patients

Information Sheet

My name is Mengestie Mulugeta Belay, a Doctoral student at the University of South Africa, Department of Health Studies. Now I am conducting my thesis work entitled "An Exploration of Culture Dependent Modifiable Risk Factors for Low Back Pain in Addis Ababa, Ethiopia: - Developing Integrated Preventative Model". You are selected purposively for this particular study. I will keep your information that you will provide me later strictly confidential. I anticipated that the findings of this particular study will have a vital significance for the prevention of Low Back Pain in the general population. The project will have especial emphasis on developing a culturally sensitive integrated preventative model for the occurrence of low back pain among our communities.

We will work together to focus on the exploration of bio-medical and socio-cultural modifiable risk factors and association with the development of LBP. Then we can able to develop a new preventative model from the findings. I will be moderate this interview. _____will taking notes on what we got from the interview, so we can help remember your comments accurately after this interview. With your permission, I would like to audio-record our interview so that I can focus on the conversation we talk and stile have an accurate record. The audio-record will be destroyed once after the voices are kept in texts.

Purpose of the Study: The purpose of this study is an in-depth exploration of the influence of cultural and social factors in vulnerability to LBP in order to develop a culturally sensitive integrated preventative mode to prevent occurrence of new cases of low back pain.

Procedure of the Study: I am going to ask you questions about those identified socio-cultural modifiable risk factors of low back pain in Addis Ababa. You were selected to participate in this study because you are believed to have significant experiences on this issues.

Confidentiality: I strongly assure you that only research team will have access to the audio recording, and we will remove identifiable information such as your name. I will keep your information that you will provide me strictly confidential. The interview that you will participate

in this study will help us to get a good result and will help us to achieve the stated benefits. Your name and other personal identifiers will not be used during or after the interview. Your participation is totally voluntary and you have a full right to not participated, refuse to respond to some questions or cut the interview at any time. This does not have any consequences on the services you wished to get from the department.

Duration of the Interview: It will take up to 30-60 minutes for completing the interview.

Whom to Contact: If you have further question about this research, you can contact Mengestie Mulugeta: Mobile: +251-912-493130 or e-mail: 62028383@mylife.unisa.ac.za

If you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please

Contact:

Professor Tennyson Mgutshini

       Professor in Public Health

       Department of Health Studies

       College of Human Sciences

       University of South Africa

       Email: Mgutst@unisa.ac.za

ANNEXE L: Consent form: for back patients

This consent form is prepared for back patients aged 18-years or above. The title of the research is "An Exploration of Culture Dependent Modifiable Risk Factors for Low Back Pain in Addis Ababa, Ethiopia: - Developing Integrated Preventative Model".

Please tick yes or no to participate in this study.

I have read or had read to me the information sheet that explains the reasons for the study, and all about the interview that I am being asked to participate in.	Yes ☐	No ☐
I understand that I have free choice of whether to take part or not and that this will not affect the service that I received from the hospital.	Yes ☐	No ☐
I understand that I have the right to refuse to answer any question that I do not want to talk about.	Yes ☐	No ☐
I also know that I have the right to leave the study at any time if I do not want to continue.	Yes ☐	No ☐
I give my permission for the interview to be audio-recorded and the transcript will be archived.	Yes ☐	No ☐
I am aware that all the information that I give will be kept strictly confidential.	Yes ☐	No ☐
I agree to take part an in-depth interview.	Yes ☐	No ☐

Declaration of Voluntary Participation on the Study:

I hereby consent to take part in this study.

Signature: Date:
_____

ANNEXE M: Grand tour questions for back patients

The in-depth interview questions for back patients are listed below.

<u>General Information</u>

1. Age: _____
2. Sex: _____
3. Educational Level: _____
4. Ethnicity: _____
5. Occupation: _____
6. Duration of LBP: _____

<u>Theme 1: Introductory Questions</u>

1. Can you explain for me about your back pain? How it started?
2. What do you think about the causes of your pain? Is it related to injury or it just happened suddenly?
3. Do you have any other medical illnesses (e.g. DM, hypertension)? If yes, which one started first, I mean your back pain or …?
4. Do you have in a romantic relationship? Is your pain have a negative impact on your relationship because some of the respondents gave me answers that they developed some sort of sexual problems after they developed back pain?

<u>Theme 2: Lifestyle Factors</u>

1. Can you explain for me your routine lifestyle? How this might prone you to LBP?
2. Can you tell me your day-today eating habits? Do you think that your habit makes you to get enough nutrients, which are essential for your wellbeing?
3. Do you know how to keep an ideal body weight? If yes, how do you keep your ideal body weight?
4. Do you think that avoiding drinking alcohol, avoiding smoking and eating traditional foods prevent occurrences of LBP? How?
5. Is attending exercise program effective to prevent the development of LBP? how?
6. Do you think that any type of movement could worsen your pain? How?

7. What type of transportation mode do you prefer most (e.g. bus, taxi or…)? Why? Can you tell me how this affects your health or pain?

8. What type of mattress is comfortable for you? Why? Is it important to select mattresses?

9. How poor physical health contributed to the development of low back pain?

Theme 3: Work-Related Factors

10. Do you sit for more than half an hour? Why?

11. Do you think that your working environment- at home or working place, is suitable for you? How is it affected your back?

12. Is bending, over-reaching and twisting aggravate your pain? If yes, how? Does these movement pattern exposed to back pain?

13. Are you satisfied with your job? If no, why?

Theme 4: Psychosocial Factors

14. Do you have family members at your home? If yes, do they supported you when you talked to them about your pain or they make fun on you? If no, why?

15. Do you have time to go out with your family members, friends or someone else? How this is important to alleviate your pain?

16. Attending any type of social programme is important for all Ethiopian. Do you go for any social gatherings? If yes, how is your pain restricted you to attend such type of gatherings?

17. How do you try to avoid any stress that you are encountered in your daily life?

18. Have you been worried a lot before you developed low back pain? Why?

19. How much do you think that you will be affected by recurrent low back pain?

Theme 5: Cultural Factors

20. Do you attend religious ceremonies? How is it important to prevent back pain?

21. Is there any over-crowding around your village? How is this related to your LBP?

22. Are you living the way you want to live? How this affects your overall health and wellbeing?

23. Is there any familial fighting at your home? How this might prone you to develop pain?

Theme 6: Knowledge on Back Ergonomics

24. Do you tried to know more about low back pain? How?

25. Do you sit in upright posture? If yes, what is the benefit of sitting in upright posture?

26. Do you know how to lift objects properly? If yes, how do you lift objects? Do you think that this mechanism could prevent development of low back pain?

27. Is there anyone who guided you how to getting up from bed, sit in a proper posture, and lift objects with great precautions? If not, have you tried to asked anyone who can help you to tell you how to handle things mentioned above?

Theme 7: Impacts of Back Pain (Self, Family, Work and Colleague, Social)

28. How much your pain interferes with your life? Try to explain for me please?

1. Do you reduced doing things at home or in the work place? Can you tell me some of them? If yes, how is your pain changed your perception towards yourself?

29. Do you think that your pain interferes with your routine activities? If yes, in what way did the pain affected your routine life? If you do have some restrictions on your day-to-day activities, how is your pain changed your perception towards yourself?

30. After you have back pain, is there any difficulties that you are not able to do (prone to different problems)? How?

31. Does your pain interfere with your sleep? How?

32. In what way does your pain affect your financial income?

33. Is getting medical treatment hard for you? If yes, Why?

34. Taking pain killer is important to reduce pain. Are the pain killers helped you to reduce your pain? why?

35. Do you think that attending medical treatment is effective to tackle your pain? how? Is following medical orders important? If yes, How?

Do you have anything else to add? Anything that I did not ask about?

Thanks for your time!

ANNEXE N: Amharic version of the questions: for back patients

ለወገብ ህመም ታካሚዎች የወጣ መነሻ መጠይቅ

1. እድሜ፡ _____

2. ጾታ፡_____

3. የትምህርት ደረጃ፡_____

4. ስራ፡ _____

5. ብሄር፡ _____

6. የወገብ ህመም ከጀመረዎ ስንት ጊዜ ሆነ? _____

መግቢያ ጥያቄዎች

1. እንዴት ነው የወገብ ህመም የጀመረዎት?

2. ዋና መነሻ ምክንያቱን ያዉቁታል? ምን ይመስለዎታል? ከአደጋ ጋር የተገናኘ ነው ወይስ ባጋጣሚ ነው የጀመረዎት?

3. ከዚህ ህመም ጋር የተያያዘ ሌላ አይነት ህመም አለበት? ማላት እንደ ስኳር ወይም ደም ግፊት? መጀመሪያ የጀመረዎ የወገብ ህመሙ ነው ወይስ ……?

4. አግብተዋል? ካላገቡ ጓደኛ አለዎት? ካገቡ ወይም ጓደኛ ካሎት፤ የወገብ ህመምዎ ግንኙነትዎ ላይ ተፅዕኖ አለው ወይስ የለውም? ካለው ምን?

5. ልጅ አለዎት? ስንት? ለሴቶች፡- ከወር አበባ ጋር የተገናኘ ችግር አለበዎት? ከዚህ በተጨማሪ እርግዝናን እንዴት ነው የሚከላከሉት? ማላት የወሊድ መቆጣጠሪያ ይወስዳሉ? ከወሰዱ ምን አይነት መቆጣጠሪያ?

ጭብጥ 1፡ የህይወት ዘይቤ ምክንያቶች

1. እስኪ ደግሞ የቀን-ተቀን እንቅስቃሴዋትን ይንገሩኝ? ከቤት ውስጥ ሥራ የሚሰሩ ከሆነ ምን ስራዎችን ይሰራሉ?

2. ስፖርታዊ እንቅስቃሴ ያደረጋሉ? ካደረጉ ምን ጠቀሜታ ያለው ይመስለዎታል?

3. በአብዛኛው ጊዜ የሚጠቀሙት መጓጓዣ (ታክሲ ወይስ አውቶቡስ) ምንድን ነው? ለምን?

4. ምን አይነት ፍራሽ ነው የሚመቸዎት? ለምን? ፍራሽ መርጦ መተኛት ጥቅም አለው ብለው ያምናሉ? ምን ጥቅሞች ያለዎት ይመስለዎታል?

ጭብጥ 2፡ ከስራ ጋር የተገናኙ ምክንያቶች

1. እስኪ ደግሞ የቀን-ተቀን እንቅስቃሴዎን ይንገሩኝ?

2. ከግማሽ ሰዓት በላይ ይቀመጣሉ? መልስዎ አዎ ከሆነ፤ ለምን? ይህ ህመሙን ይቀንሳል ወይስ ያባብሳል?

3. የሚሰሩበት የስራ ቦታ ለእርስዎ የተመቸት ነው? ካልሆነ ያልተመቸች የስራ ቦታ ወገብዎት ላይ ተፅዕኖ ያለው ይመስለዎታል? መልስዎት አዎን ከሆነ ለምን?

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4. የሚሰሩት ስራ ጎንበስ፤ ቀና፣ ዞር ወይም ሌላ አይነት እንቅስቃሴ ይፈላጋል? ይህ ህመሙን ያባብስበዋታል? መልሰዖ አዎ ከሆነ፤ እንዴት?

5. በሚሰሩት ስራ ደስተኛ ነዎት? ካልሆኑ ለምን?

ጭብጥ 3፡ የስነ-ልቦናዊና ማህበራዊ ምክንያች

1. ከማን ጋር ነው የሚኖሩት? ስለወገብ ህመምዎ ሲያዉሯቸው ምን ይላሉ?

2. ከቤተሰብ ወይም ከጎደኛ ጋር ወጣ ብለው ይዝናናሉ?

3. ከሞላ ጎደል ሁልም ኢትዮጵያዊ ማንኛውንም አይነት ማህበራዊ ግንኙነት ያደርጋል። እርስዎስ ማህበራዊ ክንዉኖችን ይሳተፋሉ? ህመምዎስ እነዚህን ነገሮች ከማድረግ አልከለከለዎትም?

4. የቀን ተቀን የኑሮ ጫናን ለመቀነስ ይሞክራሉ? ከሆነ እንዴት?

5. የወገብ ህመም ሳይዝዎት ወገቤን ሊያመኝ ይችላል በሚል ሃሳብ ይጨነቁ ነበር? ለምን?

6. የወገብ ህመም የሚድን ህመም ነው ወይስ የማይድን? ካልሆነ ተደጋጋሚ ለሆነ የወገብ ህመም ተጋላጭነትዎ ምን ይመስላል?

ጭብጥ 4፡ ባህላዊ ምክንያቶች

1. የሃይማኖታዊ በዓላት ተሳትፎዎ ምን ይመስላል? ይህ ለወገብ ህመም እንዴት ያጋልጣል?

2. በሚኖሩበት ሰፈር የሰውም ይሁን የነገሮች መጫናነቅ አለ? ይህ መጫናን እንዴት ነው ከወገብዎ ጋር የሚገናኘው?

3. አብዛኛኛው ሰው "ህይዋትን እንዳሰብኩት አይደለም የምኖረው" ይላል። እርስዎስ ህይወትን እንዴት እየኖሩ ነው? ይህ ከወገብ ጋር እሚገናኝ ይምስለዎታል? እንዴት?

4. በሰፈርም ይሁን በሚኖሩበት ግቢ አለመግባባት ይክስታል? የሚከስት ከሆነ ይህ አለመግባባት ለወገብ ህመም ሊያጋልጥ ይችላል?

ጭብጥ 5፡ የመከላከያ ዘዴዎችን ስለማዎቅ

1. ስለ ወገብ ህመም ለማዎቅ ጥረት አድርገው ያውቃሉ? እንደት?

2. ሲቀመጡ ከደረት ቀና ብለው ነው የሚቀመጡት? ከሆነ ከደረት ቀና ብሎ መቀመጥ ምን ጥቅም አለው?

3. እቃ እንዴት በጥንቃቄ እንደሚነሳ ያውቃሉ? ከሆነ እንዴት እቃ የሚያነሱት? ይህ አነሳስ የወገብ ጤናን ይጥብቃል? እቃን በጥንቃቄ ማንሳት የወገብ ህመምን እሚከላከል ይመስለዎታል?

4. እንዴት መነሳት፣ መቀመጥ፣ መቆም፣… እንዳለበት የነገሮዎት ወይም ያስረዳዎት የጤና ባለሞያ አለ? ከለሌ አልጠየቁም ነበር?

ጭብጥ 6፡ የወገብ ህመም ተጽእኖዎች

1. የወገብ ህመም ከጀመረዎት ጀምሮ ምን ነገሮችን ማድረግ አቅቶታል? ከቤት ወይም ከስራ ቦታ?

2. የወገብ ህመም ምን ያክል ተፅዕኖ አድርጎበዋታል? ጫናዎ ላይ፤ ከቤት በሚሰሩት ስራ፤ የስራዎት አካባቢ፤ ገቢዎትስ ቀንሷል? መልስዎ አዎ ከሆነ፤ ለምን? ስለዚህ ለራስዎት ያለዎት አመለካከት የተቀየረ ይመስለዎታል?

3. እነዚህን ነገሮች ባለማድረግዎት ለራስዎት ያለዎት አመለካከት ተቀይሯል? ለምን?

4. የወገብ ህመም ከጀመረዎ ጀምሮ በቂ እንቅልፍ ይተኛሉ? መልስዎ አልተኛም ከሆነ፤ ለምን?

5. ህክምና መከታተል ውጫታማ ነው ብለው ያምናሉ? ካለሆነ ለምን? ህክምና መከታተል ህመምን እንዴት ይቀንሳል?

6. የህክምና ትዕዛዝን መተግበርስ ምን ጠቀሜታ አለው? ህክምና ለማግኘት ወጪው ይከብደዎታል? መልሳቸው አዎ ከሆነ፤ ለምን?

7. የህመም ማስታገሻ ወስደው ያውቃሉ? ከወሰዱ የህመም ማስታገሻ መውሰድ ምን ያክል ይረዳል? ማስታገሻ መውሰዲ ጥሩ ነው ብለው ያምናሉ? ካልሆነ ለምን?

8. በወገብ ህመም ለመያዝ ጥሩ አጋጣሚዎች ያሉ ይመስለዎታል? ካለ ምን?

9. የወገብ ህመም ምን ያክል ያስጨንቃል? ሳይዝዎትስ ይጨነቁ ነበር?

10. ህመሙን የሚያባብስ እንቅስቃሴ ካለ ይንገሩኝ?

11. ለእርስዎ የወገብ ህመም ምንድን ነው?

12. ወገብዎ ምን የሆነ ይምስለዎታል?

ያልጠየኩዎት ጥያቄ ወይም መጨመር የሚፈልጉት ሃሳብ ካለ እድል ልስጥዎት!

ANNEXE O: Information sheet and consent form: for healthcare providers

Information Sheet

Research Title: An Exploration of Culture Dependent Modifiable Risk Factors for Low Back Pain in Addis Ababa, Ethiopia: - Developing Integrated Preventative Model.

What is this study about?

This is a research study being conducted by Mengestie Mulugeta, a PhD student at the Department of Health Studies, University of South Africa in South Africa. You are invited to participate in this research study because we are carrying out an in-depth interview to explore the influences of cultural beliefs on the health promoting and health jeopardising behaviours in the development of low back pain in Ethiopia. The purpose of this research study is to develop a culturally sensitive integrated preventative model for the prevention of low back pain.

What will I be asked to do if I agree to participate?

You will be asked to sign up a consent form for your voluntary participation, and then you will be asked to take part in the interview. The interview consists of six themes. The first theme will focus on the general introduction about low back pain, this theme will be followed by questions of socio-demographic, lifestyle, work-related, and socio-cultural factors of low back pain. The last theme includes impacts of low back pain and the influence of cultural beliefs on the development of low back pain.

Would my participation in this study kept confidential?

The researcher will take all appropriate measures to protect your identity and your contribution to the study. Your confidentiality and anonymity will be protected by not asking and telling your name in the interview and instead specific codes will be used for data management.

What are the risks of this research?

There may be some risks from participating in this study. The interaction with the researcher and talking about the story of back pain carry some level of risk. We will nevertheless

minimise such risks and act promptly to assist you if you experience and discomfort, psychological or otherwise during the process of your participation in this study. All the detailed contact numbers of appropriate authorities will be given to you in case you want to ask any questions concerning the study.

What are the benefits of this research?

You may not benefit much from this study. However, your participation and contribution to this study will enhance the development of a cultural sensitive model for the prevention of low back pain in Addis Ababa.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalised or lose any benefits to which you otherwise qualify.

What if I have questions?

This research is being conducted by Mengestie Mulugeta Belay, PhD student, Department of Health Studies at the University of South Africa. If you have any questions about this research study, please contact Mengestie Mulugeta at: The University of South Africa, Department of Health Studies. Mobile number: +251 912 493130, or email: 62028383@mylife.unisa.ac.za. If you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please

Contact: Professor Tennyson Mgutshini

    Professor in Public Health

    Department of Health Studies

    College of Human Sciences

    University of South Africa

    Email: Mgutst@unisa.ac.za

ANNEXE P: Consent form: for healthcare providers

Consent form for an exploration of culture dependent modifiable risk factors for low back pain in Addis Ababa, Ethiopia: - developing integrated preventative model in Addis Ababa, Ethiopia.

Please tick Yes or No to indicate you consent to the following

I have read and understood the participant information sheet.	Yes ☐	No ☐
I have given adequate time to consider whether or not to participate in this study	Yes ☐	No ☐
I have been given the chance to ask questions about the research.	Yes ☐	No ☐
I agree to participate in the study that include being interviewed and audio recorded.	Yes ☐	No ☐
I understand that my participation is voluntary and that I may withdraw from the study at any time without this affecting my career.	Yes ☐	No ☐
I understand that my confidentiality will kept and that personal details will not be included.	Yes ☐	No ☐
I know who to contact if I have any questions about the study	Yes ☐	No ☐
I understand that my words may be quoted in any research outputs.	Yes ☐	No ☐
I agree to participate for the interview and the data I provided will be archived.	Yes ☐	No ☐
I will receive a summary of the quantitative results and contributed my knowledge on it.	Yes ☐	No ☐

Declaration by Participant:

I hereby consent to take part in this study.

Signature: Date: /   /

_____

ANNEXE Q: In-depth interview questions for healthcare providers

General Information

1) Age: _____
2) Sex: _____
3) Qualification: _____
4) Years of experience: _____

Theme 1: Introductory Questions

1) What is low back pain?
2) Why healthcare providers used different diagnosis entities to diagnose LBP?

Theme 2: Questions for the Exploration of Bio-medical Risk Factors

1) Our study showed that back pain is associated with chronic medical illnesses like diabetes, hypertension and HIV. Is back pain prone someone to develop chronic medical diseases?
2) How occurrence of back pain associated with utilising contraceptives?
3) How occupation or working environment contributed for the development of back pain?
4) How smocking cigarette, drinking alcohol and being overweight prone to LBP?
5) Is there any association between stress, depression and PTSS with occurrence of back pain?
6) Can you explain for me how an accident may prone to back pain?

Theme 3: Questions for the Exploration of Culture Based Risk Factors

1) Why individuals who have a sedentary lifestyle exposed to low back pain? Can you explain this further, please?
2) Can you describe this for me how poor exercise habit contributed for the occurrence of back pain?
3) What type of sleeping material do you advised your patient to practice to sleep? Why?
4) Is overcrowding of people at home or in the working environment a contributing factor for the occurrence of back pain? how?
5) Could you explain for me how the preferences of transportation method prone to LBP?

6) How utilising modern technologies like laptop, TV, or smart phone exposed to back pain? Explain for me further, please?

7) Our study showed that culture influences the occurrence and persistence of pain. How culture influences the occurrence of pain?

8) Individuals who are living life as the way they expect had less likely to be affected by back pain than those individuals who had not live the way they want. What is the reason behind this scenario (life expectations)?

9) Individuals who had fighting with their family at home had a better chance of getting low back pain than those individuals who did not have encountered this problem. Can you explain for me the association between domestic fighting with the occurrence of low back pain?

10) Our study revealed that individuals who have a better social life, free time to go out with their friends, participating in religious ceremonies and social gatherings are less likely to develop back pain than those persons who do not have time for relaxation. What is the reason behind this concept?

11) Do you think that lack of knowledge on back ergonomics may predisposed to LBP?

Theme 4: Behaviour-Related Questions

1) Could you explain for me the association between reduced sleeping time and back pain?

2) Which behaviours exposed individuals for LBP?

3) Which behaviours prevent individuals from LBP?

4) How do cultural beliefs influence the development of health exposing behaviours in the development of back pain?

5) How do cultural beliefs influence the development of health promoting behaviours in the development of back pain?

6) How a relatively healthy individual prevents occurrence of back pain?

Do you have anything else to add? Anything that I did not ask about?

Thanks for your time!

ANNEXE R: Risk Factors of LBP

Here below are risk factors of low back pain that are extracted from the quantitative phase of the study. The researcher selected these factors in order to classify them as modifiable and non-modifiable risk factors. Accordingly, could you try to classify these mentioned factors as modifiable and non-modifiable factors? You can underline only those which are modifiable risk factors.

1. Demographic Factors

Age, gender, marital status, number of children, educational level, ethnicity, type of house used to live

2. Lifestyle Factors

Being overweight or obese, smocking cigarette, drinking alcohol, eating habit, physical inactivity, transportation mode, sleeping material, type of mattress, duration of sleep

3. Work-Related Factors

Occupation, job satisfaction, workload, prolonged sitting, prolonged standing, unsuitable working environment, awkward posture, movement patterns, knowledge on back ergonomics

4. Psychosocial Factors

Time for relaxation, attending social programmes, depression, job as a cause of LBP, accident as a cause of pain, stress, post-traumatic stress disorders

5. Cultural Factors

Religion, culture, sedentary lifestyle, life expectations, overcrowding, familial fighting,

Note: You can add other risk factors which are not mentioned in the above list.

ANNEXE S: Sample interview with back patient two

Age: 50

Religion: Protestant

Sex: Female

Educational level: none

Occupation: Housewife

Duration of back pain: since childhood

Researcher: How long is after your pain started?

Informant: *It is a long time ago… it persists on me for longer duration. Can you tell me the exact duration of your pain? the pain was started during labour period. There are types of labour called back labour. That is why I suffered from back pain. that is the cause for the occurrence of my back pain. My labour is mainly had come from my back. I was feel severe pain. I had worked a lot of tasks at that moment. There were many things prepared at home. There were three or four famers who used to plough the farmland. There was no time to take rest. Even I did not have took break when I gave birth. Immediately I delivered, I went to prepare food, to cook wot, and so many household chores. Due to this reasons, my body was injured.*

I gave my first birth when I was a teen. I was not able to feed him and I sent to my mother. She grew him. He is with your age. The second child was dead due to injury on his umbilicus. I know as a mother during my third birth. I understood as my baby. Before this child, I did not know anything about giving birth and being a mother.

There were different homemade activities in our house. I only focused on kneading powder, baking injera and the like. Such types of homemade activities are very demanding. We are not maintaining our body. Due to this workload and other mentioned reasons, my back was injured. My back was damaged from time to time and I was not able to sit when I was pregnant for my last daughter. I was not able to sit after a five-month pregnant mother. I spend the day with sleeping. My back was not able to carry my body. I cannot abled to sit

because my back was injured. After I gave birth, I was able to sit properly. I had a difficult four-month pregnancy time. I felt that my bones in my spine gets fractured. I feel better after I gave birth. The pain was not similar like I felt during my pregnancy period. Due to this problem, I was used contraceptive for at least 15 or 16 years in order to prevent any pregnancy. I was taking injectable contraceptive every three months' interval.

Researcher: They are saying that taking contraceptive might prone to back pain. What is your experience on this concept?

Informant: *Yes, I took it for longer time. I stopped giving birth before my age limit. I started taking contraceptive when I was young. It has greater influence on my life. I did not see menstruation for two or three consecutive years. When I saw a menstrual cycle, I feel severe pain. The bleeding was stayed for longer days. I was not able to control with modes or anything else. I finished it with severe excruciating pain. I had not able to meet with anyone else. I stayed in my home until I finished it. My appetite was also reduced. I did not eat food. After I finished the cycle, I feel better and tried to eat food. I feel better. I injected for three or six months. The contraceptive reduced sexual interest and appetite. I had check-ups for my uterus and there is no any problem. I saw menstruation for the last time two or three years ago. I am not seeing menstrual cycle. I had problem before three years ago. It was not coming based on the time table… she has history of irregular menstrual cycle… that was the biggest challenge. I think it is due to the side effect of the contraceptives that I took to control any pregnancy.*

It had side effects like loss of appetite, reduced sexual desire, weight increment, irregular menstrual cycle, and there was prolonged bleeding and pain related to menstruation. The only benefit that it had was protected me from any further pregnancy.

Researcher: How many children do you have?

Informant: *I delivered seven but I have five children.*

Researcher: Which pregnancy initiated your back pain?

Informant: *Starting from the first pregnancy, I felt pain. In all pregnancies, I was feeling back pain. But the labour was simple for my last pregnancy. It was a frontal- 'ger' easy type of labour.*

Researcher: Is there any difference between front and back labour?

Informant: *Yes, frontal labour is easier and does not damaged our body. If it is a back labour, there is stabbing type of pain felt on our back. This prone to occurrence of back pain. I was not taking any rest after I gave birth. I was spending on working an intense and hard jobs in my home. I was not able to restored my back with good foods, which has a potential healing effect.*

Researcher: What type of foods can heal damaged back?

Informant: *There are different type of foods that used to heal a lactating mother like atimit, poreage, and some types of liquid foods. there are foods used to build a lactating mother. I was not taking any type of food when I was delivered my children.*

Researcher: Do you remember the first time you went to hospital?

Informant: *I was treated in many health facilities. I was always complaining that I feel headache and back pain. They were not able to find the exact diagnosis of my compliant. They said me that it is cold. But I was not able to get the exact pathology of my disease. Before I came to this hospital, I was feeling burning sensation on my hand. Also I feel dislocation of my left wrist joint. I only felt the pain but there is no real dislocation. I feel pain when I do some type of homemade chores.*

When I was kneading a powder or lifting objects, my back opened up and not able to have reduced into its normal place. I feel a piercing type of pain and felt into the ground due to the pain. I thought that my back is open on the lower ends. When I was not able to control the pain I felt, I throw the object on my hand. In addition to this, I shouted loudly.

Researcher: What is going on inside your back?

Informant: *I do not know. But I think it is open. It opens and closed by its own. When i feel better, I can walk any distance without any difficulties. I can work any type of duties that I want to done. I also bend and twists in any direction without any pain. When I said I am feeling better, it started suddenly and makes me not to walk freely. When the pain started, even I was not able to go to the toilet. It is hard for me to sit on the Indian type of toilet. I*

should have to sit on the Swedish toilet in order to defecate or urinate. It has a higher recurrence rate. It comes and goes.

Researcher: You were saying that you have history of headache?

Informant: *Yes, I am feeling headache. Before, it was due to malaria, typhoid or typhus. I have frequent episode of typhoid and typhus. The place where I born was malaria endemic area. It is called 'Chefa', Wollo, Northern Ethiopia. I am a victim of malaria since my childhood. Then gradually I was affected by typhus and typhoid infections. I do not have vomiting, teanisomus or back pain during episode of this infectious diseases. Bu the headache is started recently.*

Researcher: Do you have history of chronic medical illnesses?

Informant: *No, I do not have.*

Researcher: What is the main cause of your back pain?

Informant: *My back pain has a long story. It might be related to the labour that I had or due to workload. Our back is the main carrier of our body parts. It is damaged during this type of incidences. This is saying from our traditional point of view… Early marriage, multiple pregnancies, contraceptives, labour are the main causative agent of back pain.*

Researcher: Do you think that multiple pregnancies make susceptible to back pain?

Informant: *I do not know anything on this point.*

Researcher: Do you add up some weights?

Informant: *Yes. After I stopped taking contraceptive, I have added some weight. During the time of taking contraceptive, I was reduced too much weight and reached around 40 and 43 kilograms. After two years later, I have showed significant increment of weight. I am able to eat what I get. That may be the reason why I have showed this raising of mass.*

I am feeling stress. I do not know where it comes from but I feel heaviness of my head. My spirit is not normal. I do not know what is it. Sometimes the disorder confused me. I am saying that this disorder is a devil spirit. Nothing is reduced for my life but I feel stress. This further makes me to feel depressed. I am not able to control my internal locus system. I feel

fearsomeness and sadness without any reasons. If you talked to me negatively, my tears dropped without any control. I will cry if a child screamed on me. If I saw mad face, I will cry easily. I do not know why it is happening on me.

Researcher: Does the pain affects your feelings?

Informant: *No, I do not know. I felt something negative inside my mind. I am trying to convince myself that this is not the right way to live life. But I am not able to control my internal feelings. I felt that why I came to hospitals. I murmured on my creator. I am experiencing such types of feelings. I am not hiding anything from you. I have problem with this disorder.*

Researcher: Are you living with your husband?

Informant: *Yes, I am.*

Researcher: Does he understood your problem?

Informant*: No, he is not understanding me. Males are not interested to understand what his wife suffers. I have blessed children's. They are helping me a lot… [sound heard from the room…] males are saying that if her wife complains back pain, she might be due to that she is not interested not to work household chores. Is it real story? I spent my entire life with working harder homemade activities. As you know, back pain is not visible disorder. My husband is not a professional who understood what is going on my back.*

Researcher: As you told me earlier, you were reduced weight. Currently you are adding up some weights. Which one is comfortable for you?

Informant: *As age increased adding up of weight does not have benefit. I should have to reduce some weights. When the load increased, the will be compressive force on my joints that are found on my back. If there is load on my bones, how could I control this load. I will not able to managed this compressive loads. This will further have predisposed to back pain. I am not a professional. It will not good to add up weights on my age. I think optimal weight level is important for everyone.*

Researcher: Do you eat meat?

Informant: *No, I do not like eating meat. I do not have interest. My doctor advised not to eat oily foods due to cholesterol. [do you take medications?] No am not taking any type of drug.*

Researcher: How it started?

Informant: *I do not know. I was surprised when I first diagnosed with this disorder. I do not know what was the main cause for its occurrence. Initially, I have history of peptic ulcer. Because of this illness, I was not eating oily types of food. They told me that such types of cholesterol might have a genetic origin. I do not know if it has association with my back pain or not. I do not exactly how it started.*

Researcher: Do you eat vegetables and fruits?

Informant: *I am not eating too much because I have constipation. It hurts me a lot. It is just like labouring a child. I have severe type of constipation. Vegetables are good for such types of illnesses. But I am not eating these foods due to typhus and typhoid. When I drink water or eat yoghurt, milk or well not cocked foods the typhus and typhoid relapsed.*

I preferred to eat roasted cereals. I do not have comfort if I eat oily food. My favourite food from my childhood is yoghurt and milk. These foods are always available at our home. Sometimes I eat fruits and vegetables. But I hate eating fatty and oily foods. I love eating maize, sugarcane and some other types of fruits that can be grown in our garden.

Researcher: Are you eating these foods, nowadays?

Informant: *No, there is not such types of food in our city. I am selective for my eating habit. If I want to eat meat, I eat only red meat. I want to eat shiro wot. I am advised to reduce consumption of salt and sugar.*

Researcher: Have you tried any type of traditional foods that are found in your area?

Informant: *No, I did not take anything. I only take the medication that was prescribed from my doctor. I am not able to take it regularly due to that I feel heaviness of my head. I do not have anything else that I am taking for my back pain. The pain was occurred due to the load from the work were I worked during my childhood.*

Researcher: How workload prone someone to back pain?

Informant: *No, I do not know.*

Researcher: Can you tell me what type of work have you been worked?

Informant: *It was household chores.*

Researcher: Can you mentioned some of them for me?

Informant: *Can you able to count the type of work you done at your home? Even you cannot able to finished the tasks inside our home. For example, in the rural part of our country, there might have two or three guests coming into our home. You should have to invite them what you have. The work is hard.*

Researcher: Have you lifted loads?

Informant: *Yes, I do. It does not seem anything for me. I was not warried too much about my health. I only worried to finished my duties within a short period of time. I was fetched water when I was young. I was feeling pain at that moment. I was fetched water more than four times a day. I had pain at the moment. I have also history of catching on my knee. When I walked, my knee stopped me suddenly and find someone to help me stand. I tried to walk again after the feeling reduced. Those type of symptom was there during my childhood period.*

Researcher: Does netting bed, cleaning house, preparing foods, cocking wot, lifting loads and similar homemade activities prone to back pain?

Informant: *I do not know. If I knew this factors prone to back pain, I was able to prevent myself from it.*

Researcher: Is living in rural or urban area has burden?

Informant: *People who are living in the rural area are maintaining their health. Is the colour of human being similar? [no]. Our lifestyle is not similar to each other. Our thinking ability is also not equal. Further, our work is not identical. Everything is different from person to person. I do not know which type of work predisposed to back pain or not.*

Researcher: What type of mattress are you using to sleep?

Informant: *It is firm mattress.*

Researcher: Which one is better for your sleep?

Informant: *The soft mattress had some discomfort. I preferred to firm one.*

Researcher: Do you preferred transportation mode?

Informant: *Yes, it is mandatory for me. If my children are there at home, they will drop me to the hospital. Otherwise, I am not able to push with other individuals in order to get taxi. I am not able to stand on the car. The transportation system is getting hard from time to time. There are no taxis, the traffic is jammed and takes longer hours. For example, today, I spent around six hours on the road. You will not able to reach based on your appointment time. It is hard.*

Researcher: Does back pain have impact on your daily life?

Informant: *Yes, I am not washing clothes. I have severe pain. If I washed clothes, I will remain there due to the pain. Even I feel pain, when I walk from one side of the room into another side. Washing clothe prone to back pain. Because it is demanding job. So how could I washed clothe? I can cook wot, bake injera and doing them other types of activities. I am not lifting loads and cleaning house.*

Researcher: how much back pain worried you?

Informant: *I do not know. It worried me a lot. I do not know the reason behind my wearisomeness. I do not know why I stressed. It may be due to cholesterol or something else. It comes suddenly. I am feeling stress and its goes away by its own without doing anything.*

Researcher: Do you go to church?

Informant: *Yes. I am not able to stand for longer hours. So I prayed in sitting position. Frequent healthcare utilisation. I feel pain, when I sit for longer hours. I walk slowly. I do not have any problem with sleeping. It might be due to the painkiller that I took. I feel pain inside my bones, which goes inside my body. It prevents me not to sleep easily.*

ANNEXE T: Sample interview with healthcare provider six

Age: 31

Sex: Male

Qualification: Orthopaedic Surgeon

Years of Experience: 6 years

Researcher: What is low back pain?

Informant: *Low back pain is pain that occurred between buttock upto neck. There are two types of back pain: upper and lower back pain. The commonest is low back pain. This is a pain originated from our buttock upto mid back level. It may be different type of pain like tingling, kneading, and the like. This all is known as back pain.*

Researcher: What are the risk factors of low back pain?

Informant: *The first one is accident or trauma. Second, sedentary lifestyle which required lack of movement. For example, those individuals who drive a car, those individuals who worked in office by sitting for longer period of time, and those who are not performing any type of physical activity are prone to back pain. Further, individuals who are obese become vulnerable to LBP. The other risk factor that contributed for the occurrence of back pain is chronic medical illnesses. There are a lot of risk factors that have contribution to its occurrence.*

Researcher: How chronic medical illnesses prone someone into back pain?

Informant: *The spine holds internal organs. For example, kidney is found near to the spinal column. When there is some sort of disorder on this anatomical structure, the symptom manifests as a back pain. Because it is found near to the vertebra. The patients may come to the clinic with chief compliant of back pain. whereas, other patients who suffered from chronic medical illnesses are become physically inactive. The may also stayed on bed for longer period of time and develop bed sore. Bed sore may manifest as a low back pain symptom. The lumbar spine has muscles. These muscles required optimal amount of movement. Muscles that is become inactive will be atrophied and contracted. This will*

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generate pain. We can call this type of back pain as referred or secondary back pain. In addition to this, different type of cancers might metastasise into the lumbar spine. This metastasise may lead to back pain. But hypertension and diabetes will not lead to back pain. Those diseases have long run consequences. It may be renal failure, cardiac diseases. This will cause the patient to become physically inactive. The consequences of medical illnesses are the main contributing factor for the development of low back pain.

Researcher: How a physical inactive individuals prone to back pain?

Informant: *For example, you are walking and moving in standing position. Those individuals who have chronic medical disorders are become physically restricted. As I told you earlier, the bones, muscles and other lumbar structures should move continuously. The spine has also joints that needs movement. If individuals are not performing any type of physical activity may prone to lack of movements on this joints. Then the joints will become stiff and the victim will not able to move his spine easily. Then he or she complains back pain.*

Researcher: What is the risk factor for the occurrence of disuse atrophy?

Informant: *As I told you earlier, in order to walk in erect posture, there are muscles that holds the spine in this position. If those muscles are not under continues firing, they will have atrophied. There are two group of muscles in our spine: right and left. If we are only working on our one body part- left or right, the other group will be atrophied and the rest will become stronger. We are right dominant and left dominant. If you are right dominant person, your right side of muscles will be stronger than the other side. this will create imbalance on your spine and your posture will be distorted. This will lead to the development of low back pain. There will be a structural change on the spine. This will precipitate the occurrence of back pain. But the pain may be reported on both sides of the patient back.*

Researcher: Does drinking alcohol and smoking cigarette may predispose into back pain?

Informant: *Earlier… drinking alcohol reduced our brain activity and concentration. A man who drinks alcohol may suffer a fall down accident or sleep in faulty posture. You understood… if he falls, he will have traumatised with the side he felt. Even if we are not saying that alcohol is a risk factor for back pain, indirectly is causes back pain. if he slept in a faulty posture, he will sustain back pain on the side he slept. Because his muscles are not*

getting enough space to stretch and relax. This is common among those individuals who are not exercising. In addition to this, smoking cigarette prone to different types of diseases. For example, when there is fracture, it will not heal rapidly. Even if this is not supported with evidence, it reduced the bone composition and prone to osteoporosis. It fastens the occurrence of osteoporosis and this will lead to development of low back pain. But you cannot say it can prone directly into back pain. It causes back pain indirectly.

Researcher: Does it may reduce the blood circulation and nutritional supply to the tissues?

Informant: *Yes, it does. That is what I am saying. Drinkers are developed fat on their body. The commonest site for accumulation of fat cells is blood vessels. The diameter of the blood vessels will reduce and the blood delivered to the peripheral tissues will become inadequate. You cannot directly correlate the blood circulation and nutritional supply to the tissues with the occurrence of back pain. it is indirect relationship.*

Researcher: Does utilising contraceptive prone to occurrence of back pain?

Informant: *Yes, it may prone to back pain. How? It is not all types of contraceptives prone to back pain. IUCD- the one which is implanted into the uterus will lead to back pain. We put this device through the cervix into the uterus. If it migrates into the other part and perforated the uterus, it will lead to the development of back pain. It can manifest as a symptom of back pain. Nerves for the uterus are originated from the spine. so they may express their symptoms as a back pain. You should have to ask them about the history of contraceptives usages by the patient. Are you using IUCD?*

Researcher: How about other contraceptives which contains oestrogen?

Informant: *Oestrogen is important for bone density. For example, post menopause age, the level of oestrogen is reduced. It reduced the minerals of bones. At that moment, the density of bone become reduced. But most contraceptives are containing oestrogen hormone. Before, they treated post menopause syndromes with oestrogen hormone therapy. Now, it is not advisable, because the side effect is more than its important. It causes deep vein thrombosis and cardiac disorders. The risk outweighs its benefits. They are stop using this hormonal therapy. Contraceptives might lead to the occurrence of chronic medical illnesses like coagulopathies. Further, they may also fasten obesity. When the body weight increases,*

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the load is carried by our bones which are found in the spine. This will create pressure on the joints and muscles and causes back pain. It is indirect risk factor. There is no evidence that supports contraceptives could lead to development of low back pain.

Researcher: Being become obese is a risk factor for the development of back pain?

Informant: *Yes. You are loading your spine with extra load. Your bones are a primary support for your weight. When your body weight is increased, there will be pressure on the bones and joints that are found on your vertebra. There will be a postural difference. You will become lordotic and bended due to the load they carried. This posture will cause back pain.*

Researcher: Does stress, depression and PTSS prone to back pain?

Informant: *Yes, they are the main risk factors for the occurrence of back pain. When someone is become stressed, all of his body system will be affected. Stress is a mental disorder. Our brain is the controlling organ for other body parts. So tension or stress may be expressed as pain. Most depressed individuals complain pain as a primary symptom. They may complain headache, back pain or other types of musculoskeletal symptoms. Post-traumatic stress syndrome is similar with these disorders.*

Researcher: Does back pain prone to stress and depression?

Informant: *Yes, it prone to these diseases. You can imagine that the victims feel pain, unable to work their daily activities and social gatherings. This leads to stress. The stress originated from back pain. It prone to stress and stress predisposed into depression. You will become hopeless and thinks that you are unable to work and live - stress and depression.*

Researcher: Can you explain for me how fall down accident prone to back pain?

Informant: *For example, someone may drink alcohol and felt on the ground. This is direct trauma to his or her body. They might fall on stone, gorge or anything else, which is a distractive object. If you felt on your back, you will develop back pain. We are not saying that alcohol is directly a risk factor for back pain but it is an indirect causative agent for back pain by causing fall down accident.*

Researcher: Does car accident predisposed into back pain?

Informant: *Yes. If it hurts your spine, why not you developed back pain? there will be fracture, muscle contusion, tissue contusion, and there may be also spinal cord injury. This will have back pain on their spine.*

Researcher: How sedentary lifestyle prone to back pain?

Informant: *Ahh… human being required any type of movement. What we called sedentary lifestyle is lack of activity. Let me give you one example for this scenario- a 40 years old gentle man is traveling to his job by driving his own car. He spent his day by sitting in his office. He also spent more time on sitting with his colleagues. This guy is not burning any calorie. He is not exercising. During exercise, his muscles, joints and body parts makes movement. This will create normal movement. For example, I am an orthopaedic surgeon. I do not have a private car. I used to travel from place to place through my foot. This gives me extra benefits for my body. This is like an exercise programme. Most jobs that I done here in my office requires bending and extending activities. This activity creates movements. So sedentary lifestyle there should be burning of calories that you ate. If you become sedentary, you are not burning calories. The foods what you ate will go into your body. This predisposed you to obesity. Body weight changed your posture. The main site for posture change is our back. You may become kyphotic or lordotic. This brings structural changes on your body and developed back pain. So we recommended them to perform physical activity for at least 30 minutes' walk for a day.*

Researcher: Does performing physical activity prevents occurrence of back pain?

Informant: *Yes.*

Researcher: How it prevents occurrence of back pain?

Informant: *…, it reduced body weight, improves body posture, and when you perform physical activity, the back muscles will be strong enough to carry the load. If one side of the spine is weaker than the other, you can make strong the weaker side with specific type of physical activity. So physical activity is used to prevent occurrence of back pain and reduced symptoms arise from it.*

ANNEXE U: Editor's certificate

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To Whom It May Concern:

Date: 11/01/2020

Re: **DOCTOR OF LITERATURE AND PHILOSOPHY** Thesis : Title: **AN EXPLORATION OF CULTURE DEPENDENT MODIFIABLE RISK FACTORS FOR LOW BACK PAIN IN ADDIS ABABA, ETHIOPIA: - DEVELOPING AN INTEGRATED PREVENTATIVE MODEL**

Client name: MENGESTIE MULUGETA BELAY

This serves to confirm that the above identified thesis was edited and finalised by feraPHASE Academic and manuscript Editing services for language and format adherence in line with the Harvard (version 2.1) manuscript formatting requirements.

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for the degree of **DOCTOR OF LITERATURE AND PHILOSOPHY** in the subject of **Health Studies** at the **UNIVERSITY OF SOUTH AFRICA**

Dr Sunil Sagoo

Director "feraPhase Academic and manuscript editing services.