PRECONCEPTION STRATEGIES TO IMPROVE MATERNAL AND NEWBORN OUTCOMES IN BLANTYRE URBAN, MALAWI

by

ALICE KADANGO

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 LM MODIBA

NOVEMBER 2017

Student number: 3369 634 9

DECLARATION

I declare that **PRECONCEPTION STRATEGIES TO IMPROVE MATERNAL AND NEWBORN OUTCOMES IN BLANTYRE URBAN, MALAWI** 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 and that this work has not been submitted before for any other degree at any other institution.

30 October 2017

_____ _____

SIGNATURE **DATE**

Alice Kadango

PRECONCEPTION STRATEGIES TO IMPROVE MATERNAL AND NEWBORN OUTCOMES IN BLANTYRE URBAN, MALAWI

STUDENT NUMBER: 3369 634 9
STUDENT: ALICE KADANGO
DEGREE: D LITT ET PHIL
DEPARTMENT: HEALTH STUDIES, UNIVERSITY OF SOUTH AFRICA
SUPERVISOR: PROF LM MODIBA

ABSTRACT

The study was done to assess the information and care the men and women have on PCC and develop strategies that could improve provision of PCC that could advance maternal and newborn outcome after pregnancy in Malawi. Most for the interventions to improve pregnancy outcome are done too late in Malawi but there is an opportunity during preconception period to plan to improve the health of the couple so that the goal of a healthy mother and baby is attained. The objectives were to: explore and describe the knowledge men and women of childbearing age have on HTSP and PCC, identify variables that influence men and women to acquire appropriate knowledge on PCC and finally to develop strategies that could assist provision of PCC in developing countries like Malawi. Adverse issues that affect the couples could be addressed promptly before the occurrence of pregnancy. A quantitative non-experimental descriptive-correlation design method was used to determine the knowledge men and women of childbearing have on HTSP and PCC. A structured questionnaire was used to collect data from 300 men and women of childbearing age. The target population for the study was prospective parents that are couples that have an intention to conceive, women of childbearing age that could be accessible at family planning, gyneacological and under-five clinics between the ages of 18-35 years. A questionnaire was adapted from a study conducted in Texas. SPSS version 20 was used to analyse the data by generating frequencies and chi- square. Kruskal Wallis test was used to determine relationship between variables and knowledge on preconception care. The constructs examined were psychological preparation, reproductive health care and the physical care that are provided to ensure a healthy pregnancy outcome. With a 100% response rate the findings indicated a gap of information and care on PCC.Services on PCC were not available in the clinics which indicated a great need to empower health care providers on PCC that could reduce maternal and neonatal mortality rate. The findings were used to develop relevant preconception strategies that would assist health providers to give PCC that would improve maternal and newborn outcomes in Malawi.

KEY WORDS

Child health guidelines; health assessment; health care provider; healthy timing and spacing of pregnancy; maternal health; neonatal health, preconception care, reproductive health care; family planning; prepregnancy care; men and women of childbearing age; unintended pregnancy.

ACKNOWLEDGEMENTS

- Praise be to the Mighty Father from whom all blessings flow, for me to have been given the opportunity to conduct this study. Right people were put in place for me to achieve this doctorate degree in a volatile environment while I pursue many responsibilities of progressing in my career, fulfilling my social roles as a wife, mother and daughter. This is one of the breakthroughs in my lifetime.
- Special thanks to Professor LM Modiba, for being a mentor and a wonderful supervisor who was always available for me and believed that I would achieve the results to contribute to the nation of Malawi to reduced maternal and neonatal mortality that is still very high. Dr Abigail Kazembe inspired me that I could contribute something to the midwifery profession.
- This study would not have been successful without the support of Mr Richmond Chinula who assisted to have the right sample size, places to collect the data and refining the instrument to get the appropriate data that could be analysed using Statistical Packages for the Social Science (SPSS) version 20.
- Special thanks to:
  - Dieula Delissaint Tchoelea, for providing the permission to use the questionnaire used in the study conducted in Texas to adapt as a measuring tool for my study in Malawi.
  - Mrs Grace Sibande, a reproductive health specialist, provided support to refine the questionnaire.
  - Mr Donald Mlombwa, who was the data collection team leader entered the data systematically for me to have appropriate results that could be meaningful.
  - Mr Genesis Chorwe worked tirelessly to assist me on analysing the data and display the results appropriately for me to draw conclusions from the study. Your effort to assist me has inspired me to help others in need.
- The study was possible because of diligent, resilient and hardworking data collectors led by Taweni Chiumia, Emma Segula, Eddie Manda, Yankho Namakhwa, and Jane Kampondeni.
- My family, husband Enwell, son Dumi and daughter Ulemu, I would like to express my gratitude for sponsoring me to conduct the study, assisting with the technical writing skills, data collection, and supervision respectively.

- This study would not have been completed without the members of the health care stakeholders that reviewed the developed guidelines. These colleagues provided relevant recommendations to the guidelines to meet the health needs according to the Malawian context. They include health care providers from Ndirande, Limbe and Mpemba, Reproductive Health Unit, Kamuzu College of Nursing, College of Medicine, Queen Elizabeth Central Hospital, Public Health Specialists, Community Health Specialists, Midwifery specialists and Ministry of Health.
- I would like to give special thanks to the following for offering professional support to have the guidelines developed like Professor Peter Nyasulu, Associate Professor Mbeba, Professor Mhango, Professor Adamson Muula, Associate Professor Kafulafula, and Mrs Maria Chikalipo.
- Lastly, I would like to convey my heartfelt gratitude to all the respondents that provided data for the study to have results.

Dedication

This research report is dedicated to my late dad, Mr Gresham Timeo Kumwenda, for his determined effort to inspire his first girl child to do well in education.

Dad, you have achieved something too!

The thesis is also dedicated to my two brothers, Symon and Charles, for providing a competitive environment that assisted me to always strive for the best at a very tender age.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ART	Antiretroviral Therapy
BMI	Body Mass Index
CD4	Cluster of Differentiation 4
CDC	Centre for Disease Control
COMREC	College of Medicine Research Committee
DDT	Dichloro Diphenly Trichloroethane
ENBC	Essential Newborn Care
FANC	Focused Antenatal Care
HAART	Highly Active Antiretroviral Therapy
HB	Haemoglobin
HIV and AIDS	Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome
HMSBaB	Helping Mothers Survive Bleeding After Birth
HPM	Health Promotion Model
HPV	Human Papilloma Virus
HTSP	Healthy Timing and Spacing of Pregnancy
IPV	Intimate Partner Violence
IUCD	Intra Uterine Cervical Device
LBW	Low Birth Weight
LMICS	Low and Medium Income Countries
MDG	Millennium Development Goals
MDHS	Malawi Demographic Health Survey
NSO	National Statistical Office
NTD	Neural Tube Defects
PCC	Preconception Care
PICT	Provider Initiated Counselling and Testing
PMTCT	Prevention of Mother to Child Transmission
PROM	Premature Rupture of Membranes

Rh factor	Rhesus factor
SDGs	Sustainable Development Goals
SGA	Small for Gestation Age
SPSS	Statistical Package for the Social Sciences
STI	Sexual Transmitted Infection
TTV	Tetanus Toxoid Vaccine
VCT	Voluntary Testing and Counselling
VDRL	Venereal Disease Research Laboratory
WHO	World Health Organization
WLWH	Women Living with HIV

CHAPTER 1

OVERVIEW OF THE RESEARCH

1.1 INTRODUCTION

Preconception care (PCC) as a strategy to improve maternal and newborn health is essential for every woman and couples to have healthy pregnancy outcomes (World Health Organization WHO 2013:1) Maternal and child health has been given much attention from the time of conception up to six weeks after the birth of the baby. Perinatal care is emphasised comprehensively to achieve a better outcome of the mother and the baby during antenatal, labour, delivery, and postpartum period. Dean, Lassi, Imam and Bhutta (2014a:1), observed that at present there is wide spread agreement that a continuum of care is necessary to further reduce maternal, newborn and child deaths from pregnancy and childbirth to the postnatal period. However, they point out that a gap remains in this continuum particularly for adolescent girls and young women who often receive little or no health care from age five until their first pregnancy. Report shows that PCC has a positive impact on maternal and child health outcome (WHO 2013:1). According to the Malawian Government (2013:50), 97% of the women of childbearing age in Malawi report for antenatal services in large numbers. Antenatal care is too late to reduce harmful effects that a woman and her partner are at risk or problems they may have on the foetus during the critical period of organogenesis. Preconception care (PCC) will be evaluated if it promotes adolescent health, reproductive planning, improving nutritional status, screening and treatment of infectious diseases, diagnosis and management of non-communicable diseases, promoting psychological health and preventing harmful environmental exposures (Dean et al 2014b:4). Coffey and Shorten (2013:1) observed that PCC remains fragmented and inconsistent, difficult to access and poorly understood by women. The study was conducted to measure the information and care that men and women of childbearing age have on PCC to improve maternal and newborn outcome. Literature reviewed and findings of the study were used to develop strategies that would assist to improve maternal and newborn outcome in Malawi.

PCC that includes reproductive planning and contraceptive use can prevent unintended pregnancies, unsafe abortions, and sexually transmitted infections in adolescent girls and

women of the childbearing age (Dean et al 2014b:7). Health promotion messages should be disseminated to women and couples before conception to determine a health outcome of the pregnancy. In Malawi, teenage pregnancy, closely spaced pregnancies, grand multiparity and births after 35 years have increased tremendously and the maternal morbidity and mortality are still very high. The maternal mortality rate in Malawi is still very high at 675 maternal deaths per 100,000 live births (Malawi Government 2010a:221). If practised in Malawi, PCC would address the issues that contribute to the poor health outcome of the mothers and the babies in Malawi. An investigation of the information and care that is provided during PCC will be done to identify the gaps that exist in Malawian setting. In Malawi 29% of adolescent women age 15 to 19 are already mothers or pregnant with their first child (MDHS 2015-16:4). Malawi needs PCC care to be provided to this age group to reduce risk factors during pregnancy.

Healthy timing and spacing of pregnancy (HTSP) is recognised as a critical and essential preventive child survival intervention that effectively compliments curative and other child health interventions (WHO 2015b:1). According to WHO report, there is evidence that if HTSP if practised, it will become an intervention that reduces risk of low birth weight, prematurity, newborn deaths and reduces health risks to mothers after a live birth or abortion. Birth spacing for children is at least 36 months to reduce risks of infant death and Malawi has a median of 41 months birth intervals (MDHS 2015-16:7). HTSP messages should be strenghthen during preconception period to promote health of women and children in Malawi. HTSP also reduces risks associated with adolescent pregnancy and creates awareness and increases demand for family planning services, which is critical to the continuity, retention and long-term use of family planning.

1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM

PCC is one of the strategies that would improve maternal and newborn outcomes as it can prevent unintended pregnancies, complications during pregnancy, stillbirth and low birth weight (WHO 2013:2). The prevalence rate of use of PCC in developed countries is estimated at 18.15% to 45% that focused on diabetic mothers with type 1 and 2 diabetis. This indicated a need of PCC even on other chronic condition to improve the risks on the mother and the baby (Steel, Luncke & Adams 2015:2). Maternal and neonatal health care remains a challenge globally and there is a need to have strategies that will address the issues affecting women and children. Mumford, Michels, Salaria and Belian (2014:2)

highlighted that there is need to develop local realistic and manageable strategies that can benefit men and women throughout their lives regardless of having pregnancy intentions. There are efforts to improve maternal and newborn care like reproductive health care that include: family planning, focused antenatal care, labour, delivery, and postnatal care. Despite the efforts to improve maternal and newborn care globally, 289,000 women died in 2013 owing to pregnancy (WHO 2015a:1). About 800 maternal deaths occurred in sub-Saharan Africa. WHO (2015a:1) indicates that the number of women dying owing to complications has decreased by 45% from 523,000 in 1990 to 289,000 in 2013. Steel et al (2015:2) indicated that there is growing evidence that PCC can improve maternal health prio to conception and directly improve the health of the mother and the fetal environment during pregnancy. Dippenaar, Da Serra, and Sellers (2012:20) reported that in most of the African countries poverty has been associated with high birth rates and high maternal and perinatal mortality. This clearly indicates that some measures need to be put in place to improve maternal and newborn health but more need to be done to improve the maternal health like inclusion of PCC. Shadab, Nakuei, Yadegarfar (2017:1) found that pregnancy interval less than 4 years between two pregnancies, abnormal weight and sexual infections usually exist before pregnancy and should be treated before conception to promote healthy outcome of the mother and the baby. Globally the developing countries have a higher burden of increased maternal and neonatal mortality rate which requires something to be done even before conception (Young, Urquia, and Ray 2013:1).

The progress is notable, but the annual rate of decline is less than half of what is needed to achieve the Millennium Development Goal (MDG) target of reducing the maternal mortality ratio by 75% between 1990 and 2015, which would require an annual decline of 55% (WHO 2015a:1). The Sustainable Development Goals (SDGs) number 3 aim at having countries to ensure healthy lives and promote well-being of all ages including men and women. Some strategies have been put in place in some countries that are contributing to a recognisable decrease in deaths of women and children. Studies that have been conducted in developed countries have indicated that PCC improves maternal and newborn health. You, Tan, Hu, Wu, Jiang, Peng, Dai, Wang, Guo and Qian (2015:8) found that if PCC is provided to clients it enhances the use of health care service like prenatal care. It has been shown that women who receive PCC and counselling are likely to develop positive health behaviours, such as daily pre-pregnancy multivitamin

consumption, early entry into prenatal care, and cessation of alcohol use (Dean et al 2014a:4). Results indicate a positive impact of the pre-counselling that is done to childbearing women and prospective parents on what should be done to eventually have a good outcome of pregnancy.

1.2.1 The source of the research problem

In Malawi 29% of adolescent women age 15 to 19 are mothers or pregnant with their first child creative a big demand of PCC that would improve their health and babies before the next pregnancy (MDHS 2015-16 4). The neonatal mortality rate for Malawi according to United Nations Children Fund (UNICEF) (2015:1) is 22% per 1,000 live births and is highest at 29% in rural areas. The main causes of neotal deaths is prematurity at 33%, birth asphyxia 25.8% and congenital anomalies about 9.9% (UNICEF 2015:1). Most of these causes come from conditions and practices that could be prevented during PCC. PCC emphasises on the improving of condition of the mother to improve the fetal environment to survive from stillbirths, miscarriages, congenital abnormalities and macrosomia (Steel et al 2015:2).

Malawi has a very high maternal and infant mortality rate of 675/100,000 live births and child mortality rate of 31 per 1000 live births respectively (Malawi Demographic Health Survey (MDHS) 2010:93; National Statistical Office 2011a). A study conducted in Malawi by Mkandawire and Kaunda (2001) reveal that Malawi has 7.5 per 1000 births that are born with congenital abnormalities like neural tube defects that accounts for 1.3 per 1000 births. At present, some of the guidelines and interventions to prevent neural tube defects are not available in Malawi. Mkandawire and Kaunda (2001) highlight that none of the mothers that gave birth to children with neural tube defects in Malawi were given folate supplementation to prevent similar deformities in future pregnancies. Although Malawi is trying to address the problem of high maternal and infant mortality rate through provision of quality services at health facilities when a mother is pregnant, some of the interventions need to be done before conception to have a healthy mother and baby. A study by Whirtworth and Dowswell (2015:38) explain that the provision of routine health promotion through advice, education and screening tests before conception may improve the health of the mother and the baby.

Apart from the prenatal care that is provided universally to all pregnant mothers, there is need to intensify the provision of PCC to identify risks and treat them before pregnancy to have healthy outcome of the mother and the baby. Dean et al (2014b:1) explain that in developing countries improving adolescent health and preventing adolescent pregnancy and promoting birth spacing through use of modern family planning methods are fundamental to PCC. A study conducted in Dar es Salaam reveals that the use of contraceptives does not help women of the childbearing age and parents do not adhere to proper timing and spacing of pregnancy (Muganyizi & Mageta 2013:1).

The Malawian population has currently fertility rate of 5.7 births per person, high teenage pregnancies, and closely spaced pregnancies including many congenital abnormalities and health effect on mothers and their new-borns (MDHS 2015-16:3). Some of the problems encountered that can be prevented before conception are infections, anaemia, nutritional deficiencies, diabetes, and pregnancy hypertensive disorders. The effects that can be prevented are abortions, preterm births, stillbirths, intrauterine growth retardation and pregnancy-related problems of the mother like preeclampsia, postpartum haemorrhage, obstetric fistulas, and infections. Future parents need more relevant information that would assist them to make appropriate choices that would improve maternal and newborn outcome. Preconception strategies developed after the study will assist health care providers to ensure access of PCC to all the people from adolescent to childbearing age to improve maternal and newborn outcome.

There are many entry points where PCC and information would be provided to individuals prone to conceive and preparing to get pregnant. Initiation ceremonies for boys and girls, youth drop-in centres, bridal shower, and couple counselling on marriage, adolescent health care centres and family planning clinics would be appropriate to provide care and information on PCC. Research was conducted to assess if in all these settings, preconception counselling is provided to prepare future parents to having pregnancy. According to Mumford et al (2014:1), the preconception window has been recognised as one of the earliest sensitive windows of human development for optimising health during childbirth as well as urological and gynaecological health. It is important to include men so that they participate in health care issues. Davis, Vyankandondera, Luchters, Simon and Holmes (2016: 3) highlighted that men need to be provided with information so that they can support their spouses to practice healthy behaviours. Men need to be incorporated when providing preconception care.

1.2.2 Background to the research problem

Antenatal care is provided comprehensively in Malawi as about 97% of pregnant mothers utilise antenatal service (Malawi Government 2010b:24). Prenatal care should follow PCC so that most of the pregnancies should be planned when one is ready and has met the criteria to have a child. One of the strategies of the Ministry of Health for accelerating the reduction of maternal and neonatal mortality and morbidity in Malawi is to ensure that communities access quality health care services that ensure availability of preventive services that would assist to have a better outcome of the mother and the baby after birth. Moreover, the community needs to have appropriate information that affect reproductive health for them to have the right choices and better practices that improve maternal and child health (Malawi Government 2005:6). Women of the childbearing age need appropriate screening from diseases that would affect their pregnancy outcomes. Physical assessments should be a priority to all women of the childbearing age to rule out conditions that would cause adverse effect on the outcome of pregnancies. A study conducted by Steel et al (2015:1) provide evidence that PCC may have an important role in preventing short-and long-term adverse health consequences for women and their babies.

There are gaps identified in women's knowledge of PCC on patients that have chronic diseases like hypertension, diabetes, cardiac, and respiratory problems. Most of the couples that are planning to have babies do not take advice or precaution measures that would assist them to have healthy pregnancy outcomes. Wang, Cao, Peng, Xin, Zhang, Yang, He, Xu, and Ma (2015:9) reported the benefits of taking folic acid prior one year before conception that it reduced occurrence of preterm births. Guidelines to measures or interventions that would be provided to the populations of the childbearing age are not available in Malawi. PCC should include urological examination for males and gynaecological examination that would assist to identify sexual reproductive problems that would be treated on time before conception. In Italy, the study conducted in high schools and universities revealed that young adults did not have adequate information on fertility and PCC and interventions are being put in place to increase the awareness towards the preservation of male and female fertility and the concept of preconception health (Poscia, Milia, Lohmeyer, Teleman, Waure & Ricciardi 2015:119). The Malawian childbearing population needs information on PCC and to find interventions that would be

put in place to assist in reducing maternal and neonatal mortality rate through PCC. Health promoters and health educators need to introduce a sense of urgency to engage in PCC hence the need for standardise guidelines and interventions to provision of PCC in Malawi (Delissaint 2008:69).

1.3 RESEARCH PROBLEM

There is high maternal and neonatal mortality rate in Malawi that can be reduced by provision of PCC to improve maternal and newborn outcome. The provision of PCC in private and public facilities is not available and there are no guidelines in place to standardize the provision of PCC in Malawi. On some interventions on PCC MDHS (2015-16:9) indicated that 4 out of 10 women reported that their pregnancies are unplanned, maternal undernutrition and iron deficiency aneamia increase risk of maternal death according to at least 20% of maternal mortality worldwide. Malawi lacks strategies in place to provide access to information and care during pre-pregnancy phase so that couples and individuals are prepared to have a baby when they are healthy and psychologically prepared. There are no guidelines to provide uniform provision of PCC in Malawi and no wellness clinics that could support health individuals to have assessment. The challenge that is encountered is that most of the maternal and newborn efforts to improve quality care in Malawi are done too late when individuals and couples are already pregnant. MDHS (2015-16:8) still report a high maternal mortality rate of 439/100,000 live births in Malawi which need strategies, multidisciplinary and multisectoral approach that could reduce it.

The consequences of late contact to health care lead to adverse effect that are detrimental to maternal and newborn outcome. Some of the direct causes of lack of PCC in Malawi are 33% pregnancies ending with prematurity and 9.9% have congenital abnormalities UNICEF (2015:1). The high maternal and neonatal deaths are persisting despite interventions such as focus antenatal care (FANC), helping mothers survive bleeding after birth (HMS BAB), life-saving skills in obstetrics, essential newborn care (ENBC), and helping babies breathe (HBB). Provision of micronutrients, nutrition counselling, screening, management of medical conditions, and prevention of risky behaviours such as cigarette smoking and alcohol intake during PCC can help to reduce maternal and neonatal morbidity and mortality. Wahabi, Alzeidan, Bawazeer, Alansari and Esmaeil (2010:12) provided evidence that uncontrolled diabetis especially

hyperglycaemia during organogenesis is associated with congenital malformations. Knowledge on the importance of PCC motivates clients to seek PCC services. In Malawi, there are no standardised guidelines that include interventions to improve the provision of PCC. If women have knowledge on PCC it makes them to be proactive to indulge in health care activities that would improve the outcome of pregnancies (Barrett, Shawe, Howden, Patel, Ojukwu, Pandya & Stephenson 2015:6).

1.4 AIM OF THE STUDY

The study investigated the PCC that is provided in the Malawian context and identified the gaps that exist and find opportunities to provide PCC that improves the health outcome of the mother and the baby.

1.4.1 Research purpose

The research purpose was to identify the PCC that is available in Malawi and identify the gaps that exist and develop appropriate guidelines andd strategies that would assist to improve maternal mortality rate that is very high in Malawi. In Malawi, PCC is not highly emphasised in provision of maternal and newborn health that can assist to reduce the detrimental effects during pregnancy to have a healthy mother and baby.

1.4.2 Research objectives

The research objectives were to

- explore and describe the level of knowledge women of childbearing age have on HTSP/PCC
- explore and describe the level of knowledge men of childbearing age have on HTSP/PCC
- establish the time when information about HTSP/PCC is provided to prospective parents that intend to get pregnant
- assess a relationship between the PCC information provided with the age of the mother, education level, parity, intended pregnancy and socio-cultural factors of the mother

- develop relevant preconception interventions that would assist to improve maternal and newborn outcomes in developing countries

1.5 SIGNIFICANCE OF THE STUDY

The research findings of this study shall map out the gaps that exist in PCC. In addition, the study shall provide measures that can be put in place to provide quality care to clients before it is too late when they are already pregnant. The results will provide data on the information and the care that is provided before conception to have healthy maternal and newborn outcome. Norris, Ho, Rashed, Vinding, Skau, Biesma, Aagaard-Hansen, Hanson and Matzen (2016:3) reported that one of the barriers for couples to practice healthier lifestyles is lack of knowledge,awareness and health literacy.The findings of the research will help to provide data that will be used to design health care messages to adolescents, women of the childbearing age and their spouses to get care and information that is culturally sensitive and relevant to the Malawian setting so that maternal and newborn health is improved. Moreover, the study of this nature will help policy makers and prospective parents to have interventions that should be done to improve the health outcome of the mother and the babies. Basics Healthy Timing and Spacing of Pregnancy should be done inorder to reduce the risk of adverse maternal, perinatal and infant outcomes. Spacing after a live birth should be at least 24 months. The study intends to promote HTSP to adolescents and women of the childbearing age so that there is a healthy outcome of the mother and the baby. The information will help to reorganise the delivery of nursing and midwifery services so that PCC is provided as a package to all couples and mothers preparing to get pregnant. Findings will assist in the updating of policies and standards for the provision of PCC.

The study done extensively in three clinics in urban Blantyre provided evidence that there is much gap in provision of PCC in Malawi. There is need to have strategies that could address the provision of PCC. The extensive literature search provided the insight on what should be done to improve PCC. Guidelines developed according to needs of the people in Southern region will guide policy makers to conduct a country survey and strategies on how PCC would be provided Malawi.

1.6 DEFINITIONS OF TERMS

1.6.1 Definition of concepts

Pre-conception care: A set of interventions that aim to identify and modify biomedical, behavioural and social risks to a woman's health or pregnancy outcome through prevention and management (Dean et al 2014c:2).

Healthy timing and spacing of pregnancy (HTSP): An intervention to help women and families make an informed decision about delay of the first pregnancy and the spacing or limiting of subsequent pregnancies to achieve the healthiest outcomes for women, newborns, infants and children. Client should access free and informed contraceptives choice taking into account fertility intentions and desired family size as well as the social and cultural contexts (WHO 2015b).

Maternal health: The health of women during pregnancy, childbirth and the postpartum period. It encompasses the health care dimensions of family planning, preconception, prenatal, and postnatal care in order to reduce maternal morbidity and mortality (WHO 2015a).

Neonatal health: The state of wellbeing of a baby just born and up to 28 days of life and factors during pregnancy could influence wellness of the newborn.

Child health: The state of physical, mental, intellectual, social, and emotional well-being and not merely the absence of disease and infirmity. Healthy children live in families, environments and communities that provide them with the opportunity to reach their fullest developmental potential (WHO 2015b).

1.6.2 Operational definitions

Prospective parents: A couple or an individual who are/is expecting to be pregnant and have a baby.

Birth spacing: The recommended period passed after birth of the baby, abortion or stillbirth before getting another pregnancy.

Knowledge: Acquired information that is to be followed before conception to improve the health outcome of the mother and the baby.

Healthy outcomes: Mother and a newborn that have no complications at birth and adjusting well during six weeks postpartum period and to the exrauterine environment respectively.

Unintended pregnancies: Pregnancy that comes by chance not choice or unplanned pregnancy.

Cultural practices related to timing of fertility, birth and marriage: (MDHS 2015-16:16)

- Women of childbearing age have their first intercourse at 16.8 years and get married at 18.
- At 19 years women that have no education have their first birth
- 13% of Malawian women age 15-45 are in a polygynous union especially those that have no education.

1.7 THEORETICAL FOUNDATIONS OF THE STUDY

A Health Promotion Model will guide the research to use the PCC that is accessible to patients before having the sick role and will increase patient's level of well-being. Kachingwe-Sisya (2014:34) and Polit and Beck (2010:209) explained that a theoretical framework guides the study to develop research objectives, development of structured interview schedule, organisation of literature and the presentation and discussion of the results. According to Pender, Murdaugh and Parsons (2011:1), individual characteristics and experiences influence health behaviour if there is perception of the benefit of the behaviour; people experience the desired outcome of health. Women of childbearing age would practice good health habits before pregnancy to prepare to have a health outcome of a healthy mother and the newborn.

The study will use the health promotion model to promote the people to actively regulate their own behaviour to improve their behaviour and lifestyles during the preparation to

conception. Individuals and couples will be more proactive to seek risk screening to infection that have impact to pregnancy, will practice HTSP to prevent complications of pregnancy that occur when pregnancy come too soon and too late. The study will follow Pender's Health Promotion Model to link the concept that PCC is an intervention that will promote health outcome of the mother and their newborn. Polit and Beck (2012:127) highlight that people will make a decision to comply with health behaviour like use of contraception, preventive health screening and take a good nutritious diet if are able to perceive the desired outcome of the health behaviour benefit.

1.7.1 Theoretical framework

The study was underpinned by the Health Promotion Model (HPM) by Pender who has a framework that can help health care providers to help client achieve improved health, enhance functional ability and have a better quality of life after adopting the PCC concept (Peterson & Bredow 2004:291).

The model is based on established theories of human behaviour, reasoned action, planned behaviour and social cognitive theory. PCC aims at prevention of health problems before they occur and avoidance of disease to have a healthy outcome of the mother and the baby. Taking of folic acid during the preconception period prevents occurrence of neural tube defects and is a good example of health promotion among the people. Pender utilises health promotion model to individuals, family and community to have the potential to achieve goals set so that structural integrity is maintained and there is harmony with the relevant settings.

1.7.2 Pender's Health Promotion Model

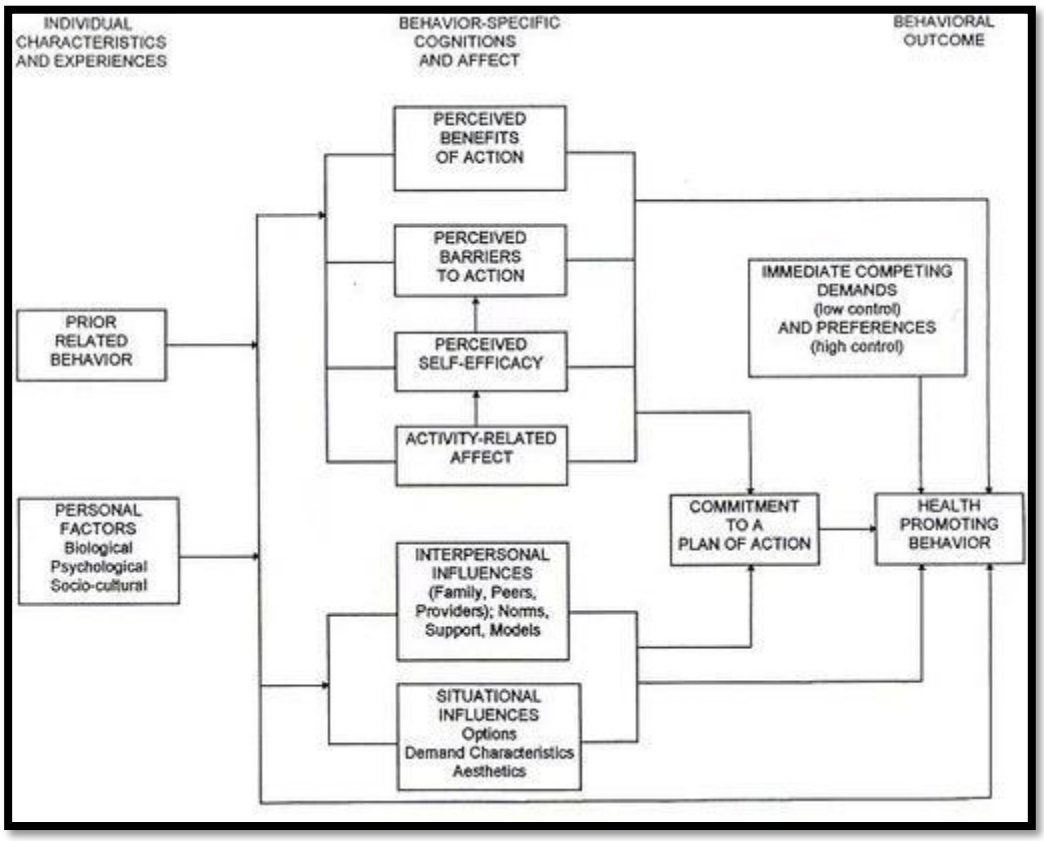


Figure 1.1: The Health Promotion Model

(Pender et al 2011)

According to Pender et al (2011), the HPM is based on established three theories of human behaviour, including reasoned action, planned behaviour and social cognitive theory. A person will intend to do a behaviour when he or she believes that the outcome of that behaviour is desirable and can perceive the benefits, has control over the situation and has potential to successfully carry out an action. When a person has a belief that has high-perceived competence or self- efficacy in a certain behaviour, it results in a greater likelihood that the person will commit to action and perform the behaviour. Furthermore, Peterson and Bredow (2004:291) state that HPM is competence-oriented approach that focuses on attainment of high-level wellness and self-actualisation. Glanz, Rimer and Lewis (2002:9) define health promotion as any combination of health education and related organisational economic and environmental supports for behaviour of individuals, groups, or communities conducive to health. Health promotion is an art that influence individuals to improve their lifestyle facilitated by awareness, change in behaviour and create environments that support good health practices. The major motivational

mechanisms for health promoting behaviour are perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related effect, interpersonal influences, and situational influences. All the perceived behaviours will lead a person to be committed to do a plan of action to achieve a health promoting behaviour. The guidelines and interventions on PCC would assist prospective parents to perceive the benefits of preconception health care that will make them to have the self-efficacy perceived to make them committed to a plan of action to achieve a desirable behaviour that focuses on attainment of self-actualisation (see Figure 1.1).

1.8 RESEARCH DESIGN AND METHOD

1.8.1 Research paradigm

The appropriate design to match the study was the non-experimental descriptive-correlation design. Polit and Beck (2010:236) assert that the purpose of descriptive studies was to observe, describe and document aspects of a situation. The descriptive correlational study made the researcher to describe relationships among variables without attempting to infer causal connection. The researcher described the relationship between getting appropriate information about PCC and relate to the practices in pregnancy that would assist to achieve a healthy pregnancy outcome (Polit & Beck 2010:236). The data was collected from the prospective parents in relation to the care and information they received that would assist them to have a healthy outcome of the mother and the baby. The subjects were men and women of childbearing age intending to get pregnant. In addition, Burns and Grove (2009:237) highlight that the purpose of descriptive correlational design was to examine the relationships that exist in a situation, as many interrelationships were identified in a short time. In the study, associations between variables were described to determine if couples and individuals would change their lifestyles if information and care were provided before conception.

1.8.2 Research methodology

The research study used a quantitative research method to generate information that the subjects know about PCC. Information was obtained from the study and the researcher identified variables, developed conceptual and operation definitions and the collected relevant data (Polit & Beck 2012:53). Quantitative research method was used to measure

the concept of PCC that is provided in Malawian health care settings and the gaps were identified to improve the care before pregnancy in order to yield healthy outcomes of the mother and the baby (Bryman 2012:164). Furthermore, Bryman (2012:176) maintains that the findings will be generalised beyond the confines of the particular context in which the research was conducted as the respondents in the study will be recruited from the representative sample.

Data were collected using a developed questionnaire and results were analysed using statistics. Moreover, the research used quantitative approach to investigate what is available on the ground on the care that is provided before conception to have a healthy outcome of the mother and the baby. In order to generate information, a survey has to be conducted on the selected sample that will provide information and later the findings would be generalised to the study population. The relevant strategies will assist policy makers to improve on provision of care that would assist individuals to have improved outcomes of pregnancy.

1.8.3 Research design

A quantitative, non-experimental descriptive-correlation design was used in this study by utilising a formulated questionnaire. The researcher followed the research steps from the beginning of the study when a question is asked to the end when the question is answered (Polit & Beck 2012:56). Burns and Grove (2009:23) describe quantitative research as formal, objective and systematic method using numerical data to obtain information on reality of the world. The quantitative paradigm describes the variables and examines the relationship among variables. Information was gathered systematically and was analysed using statistics to quantify the knowledge and care the people have before conception (Polit & Beck 2010:16). The quantitative paradigm described the variables and examined the relationship among variables.

Appropriate instruments were designed to collect the data and measure the human behaviour in relation to appropriate behaviours that would assist to have a healthy outcome of the pregnancy. A representative sample was selected from a cross section of the population that had relevant factors, variables and events that matches the proportions in the overall population (Denscombe 2010:24). In quantitative paradigm, surveys can be used to gather data, through self-reporting about an identified and specific

population and the data can be collected through postal telephone or online questionnaires (Moule & Goodman 2009:179). The study measured the knowledge and care that has been provided to the subjects before conception. The subjects comprised women and men of the childbearing age intending to get pregnant. The findings from the study was used to develop strategies that would be used in health care settings to improve maternal and newborn outcome.

1.8.4 Descriptive study design

The researcher utilised non-experimental study as the information on PCC will not need to manipulate the independent variables (Polit & Beck 2012:223). Burns and Grove (2009:237) describe descriptive study design as designs that gain more information about characteristics within a particular field of study. Accordingly, the descriptive design examined the PCC that is provided then identify problems with current practice, justifying current practice and making judgements. Polit and Beck (2012:226) explain that descriptive research aims to observe, describe and document aspects of a situation as it naturally occurs and describe relationships among variables.

Variables were identified to determine an overall picture of the phenomena being examined. A sample size was selected to represent the population under study and valid and reliable instruments were used. Furthermore, Burns and Grove (2009:246) argue that the purpose of descriptive correlational design is to examine the relationships that exist in a situation as many interrelationships will be identified in a short time. The care that is provided will be analysed and identify the gaps to formulate interventions that would assist to reduce maternal and newborn care.

1.8.4.1 Setting and population of the study

The study was conducted at health care clinics like family planning clinics, gynaecological and under five clinics where the women of childbearing age report for services in large numbers. Blantyre City population is about 783,296 and has Limbe location that has people about 114,858, Ndirande location about 221,227 people and Mpemba has about 147,676 people (Mould 2013: 6). All these three urban locations of Blantyre City have one Ministry of Health (MoH) health centre each that provide integrated health services of people in the catchment area like family planning services, under five clinic and other

maternal and child health services. The clientele on average was about 120 clients per day coming for various health care services. The three clinics were sampled to involve men and women of childbearing age between 18 to 35 years of age that were chosen as subjects in the study. The researcher was based in the Southern part of Malawi in Blantyre Urban District where the study was conducted around the three health centres that surround this particular Blantyre District Hospital.

The target population for the study was prospective parents. These included couples that have an intention to conceive, women of childbearing age that could be accessible at family planning clinic, gynaecological clinic and under five clinics intending to conceive between the ages of 18- 35 years. Burns and Grove (2009:343) underscore that the sample is obtained from the accessible population and findings are generalised first to the accessible population and more abstractly to the target population. The sampling frame in the research study was listed so that each person in the target population had the opportunity to be selected for the sample (Burns & Grove 2009:346).

1.8.4.2 Sample size

A sample size that is representative to the total population was calculated to have findings that can be generalised to the entire population. In quantitative research, the sample size can be determined by using statistical computation (Hami 2012:84). In this study, the accessible population is the clientele of men and women of childbearing age that are attending family planning, under-five and outpatient clinics at Ndirande, Limbe and Mpemba. To calculate the sample size that is representative of the study population Slovin's formula was used. Andale (2012) highlights that a formula helps to calculate a sample from a known population.

SOLVIN'S FORMULA:

$n= N/ (1+ Ne^2)$
n= the sample size
N= the known population
e = the desired margin error or error tolerance which is taken at 95% confidence Interval (0.05) the sample is been calculated from the total number of expected.

Pregnancies in the three sites. In the study done the accessible population was the men and women of childbearing age that are 18 to 35 years old coming for health care service to the different clinics.

1.8.4.3 Sample and sampling method

Probability sampling method was used to allow each member to have the chance to be chosen for the sample so that there is representativeness to the population to develop appropriate strategies in PCC that would be applicable to the people before conception. Quantitative research used stratified random sampling to have subjects that are homogenous in relation to study variables that represent the total sample. Polit and Beck (2012:281) stated that stratified sampling designs subdivided the population into homogeneous subsets. In the study the subdivision was men and women between 18 to 35 years of childbearing intending to get pregnant in the five years to come. The researcher used probability sampling method through use of clients that reported for various health sevices at the clinics.

The inclusion criteria include men and women of the reproductive age that are intending to get pregnant between the ages of 18 to 35 years of age with at least one child. In quantitative research, the sample from an accessible population is selected to represent the population so that the results can be generalised to the target population. Quantitative researchers have a sampling plan that specifies in advance, how participants are selected and included in the sample (Polit & Beck 2012:273).

1.8.4.4 Data collection methods and procedures

Data collection plans for quantitative studies ideally yield accurate, valid and meaningful data (Polit & Beck 2012:294). Eligible respondents that had agreed to participate in the study were asked questions using the structured questionnaire formulated. The questionnaire consisted of closed-ended questions and open-ended questions. Some sections gathered major demographic and health characteristics of the sample like age, gender, marital status, race, ethnicity, education, and social economic status (Polit & Beck 2012:293). The questions targeted the variables in the Health Promotion Model that influence the people to seek for health screening and practice health habits before they

get pregnant. It was envisaged that clients attending various clinics would provide information related to what practices were related with the preparation of the pregnancy.

1.9 DATA MANAGEMENT AND ANALYSIS

The study used descriptive correlational statistics to analyse the data like the mean, mode, and standard deviation to describe one variable at a time to communicate information about the study sample (Polit & Beck 2012:389). Quantitative data was analysed using packaged computer analysis programs such as Statistical Packages for the Social Science (SPSS) (Burns & Grove 2009:464). The researcher needed to feed the appropriate data collected from the study and feed in the packaged computer programs to perform data analysis. Technical skill was needed and a statistician was consulted to assist with the appropriate programs but the researcher as an expert in the maternal and child health care did the interpretation of the data.

1.9.1 External validity

Environment and setting of the subjects has to be consistent for all the subjects to minimise extraneous variables into the study situation. The variables that could affect the validity of the study like age, education, social class, accessibility to resources, and social cultural factors were scrutinised. The findings could be generalised to the study population in Blantyre urban clinics as stratified random sampling was utilised. Design strategies used to control extraneous variable were employed like random sampling, selecting subjects that are homogenous and matching subjects between groups in relation to a particular variable and statistical control. Three language specialists, research ethical committee, the superviser and the statistician verified that the instrument was able to obtain information and care that men and women of childbearing age had on PCC.

1.9.2 Internal validity

The researcher was aware to control the extraneous variables that would lead the study to have false positive or false-negative conclusion (Burns & Grove 2005:228). According to Polit and Beck (2012:244), it is important to control external events that take place concurrently with the independent variable that can affect the outcomes. The researchers

need to be aware of any change that occurs as a function of time. A stratified random sampling was used to control extraneous variables to achieve validity. In quantitative research, there is also need to be aware of a threat of instrumentation whereby there could be bias due to changes in measuring instruments or methods of measurement between two points of data collection (Polit & Beck 2012:244). The inclusion criteria brought elements of the same characteristics of respondents. Data collectors were trained intensively so that there is consistency during sampling and data collection. During the process of testing the instrument, the data collectors could be more experienced or less accurate or sometimes the participants become bored to be asked the same questions and could answer haphazardly. Data collectors and subjects have the potential to bring bias to the results. Data collectors were trained to be familiar with the instrument to collect valid data. The questionnaire comprised questions that are precise and clear to the subjects as the instrument was reviewed by three language specialists. The questionnaire items were pilot-tested before being administered to the respondents.

1.9.3 Construct validity

The questionnaire was formulated based on the concepts in the theoretical framework so that instruments should measure the intended concept not something else. The Health Promotion Model concepts will be related to develop the instrument that will measure if there are practices in PCC that improve the health outcome of the mothers and their babies.

1.9.4 Reliability

Reliability is the consistency with which an instrument measures the attribute in assessing quality of the data in quantitative research (Polit & Beck 2012:373). Same instruments administered to the same individuals at two different places is able to yield same responses if the tool is reliable. The instruments need to be tested for reliability before they are used in the research study. The aspects that reliability of the instrument can measure in quantitative research include stability, internal consistency and equivalence.

1.9.4.1 Reliability: Stability

According to Burns and Grove (2005:374), stability is when there is consistency of repeated measures of the same attribute with the use of the same scale which is referred to as test retest reliability. The factor to be measured remains the same at the two testing times and that any change in the value or score is a consequence of random error. Test retest reliability was done before conducting the study to ensure reliability of the instruments. Furthermore, a pilot study was done to test the instruments for reliability. Polit and Beck (2012:331) state that instrument reliability is the consistency with which it measures the target attribute in the research study. In order to determine the reliability of the instruments, the correlation coefficient should be calculated to determine the relationship between variable. The researcher should be aware that some variables can change if an instrument is administered twice to the subjects.

1.9.4.2 Reliability: Equivalence

The focus on equivalence is the comparison of two versions of the same instrument collected by two observers measuring the same event. Comparison of two observers is referred to as interrater reliability (Burns & Grove 2005:334). Researchers should have a common interpretation of a construct and reach a consensus to ensure that the instrument is reliable (Polit & Beck 2012:334). All data collectors were tested for interrater reliability. Equivalence of the instrument was realised by comparison of the agreements obtained between raters on the coding form with the number of possible agreements. Training of researchers need to be done to yield data that is equivalent and the researcher needs to supervise the data collectors to ensure data collected is equivalent. Polit and Beck (2012:333) point out that the findings from two different data collectors need to be compared to get the interrater reliability that is 0.0 to +1. Cronbach's alpha was used to assess the internal consistency of the structured instrument. Anomalies identified during pilot study were corrected to increase reliability of the instrument.

1.9.4.3 Reliability: Internal consistency

The instrument is internally consistent or homogeneous to the extent that its items measure the same traits. Internal consistency is valued using coefficient alpha, which is

an index of internal consistency to estimate the extent to which different subparts of an instrument are reliably measuring the critical attribute (Polit & Beck 2012:334).

1.10 SCOPE OF THE STUDY

The study investigated information and care that is provided during PCC but the concept is not well defined in Malawian context. There is fragmentation of the information and interventions that is provided on preconception care. Research findings intend to describe the gaps that exist so that apart from the antenatal care, labour and delivery care and post-partum care there should be PCC to yield healthy pregnant outcomes. Guidelines should be available to remind health care providers to counsel patients on PCC that would assist families to have healthy pregnancy outcomes. The study of this nature has not been done in the country. Therefore, it would be good to explore the interventions that can be done so that PCC is provided in the Malawian health care. People are not keen to practice health practices before a problem is noticed and will not find it relevant to seek PCC. Appropriate messages on PCC will assist patients to improve health care practices and ensure a healthy mother and baby after pregnancy. The participants were sampled from the southern region and few areas were used to collect data which will make it difficult to generalise the findings to the two regions that will not be involved in the study.

1.11 STRUCTURE OF THE DISSERTATION

The study comprised of the first chapter which was the orientation of the study that included the introduction of the overall research study and grounding theoretical frame work of the study that is based on quantitative research paradigm based on Pender's HPM. The second chapter explained the conceptual framework that the study had used to develop relevant interventions and strategies that would assist Malawian communities to practice PCC. The findings on the use and benefits of PCC as used by other countries and how it is influencing maternal and child health outcome was highlighted expliticily in Chapter 2. The fourth chapter discussed the research methodology including the design, instruments, data analysis and how the study has been conducted. In addition, the procedure to analyse data and computer programs used was highlighted in this chapter. Chapter 5 displayed the results of the study while chapter six and seven included the interventions and strategies found after conducting the study, conclusion of the findings in relation to the problem statement and the limitations of the study for its findings to be

used throughout the whole country. Recommendations, importance of the research and conclusions were incorporated in the last chapter. Finally, the appendix included details relevant to the overall study, sample questions, informed consent, and correspondence letters.

1.12 CONCLUSION

Chapter 1 had given an overview of the background to the research problem, purpose and objectives of the study, aspects relating to the research design, significance of the study and scope and limitations of the study. The study intended to describe PCC that was provided in Malawi using quantitative research paradigm. The researcher would ensure there is validity and reliability of the instruments that were used to collect data that would be used to develop relevant interventions on PCC. Ethical issues were also discussed so that the participants make their own decision to participate in the study and the research process would not inflict harm but benefit themselves as well as others in the near future.

CHAPTER 2

CONCEPTUAL FRAMEWORK

2.1 THEORETICAL FOUNDATION OF THE STUDY

The Health Promotion Model (HPM) was used to underpin this research. The PCC is accessible to clients prior to their sick role and will increase patient's level of wellbeing. Research explained that a theoretical framework guides the study to develop research objectives, development of structured interview schedule, organisation of literature and the presentation and discussion of the results (Kachingwe-Sisya 2014:34; Polit & Beck 2010:209). According to Pender et al (2011:5), individual characteristics and experiences influence health behaviour; if there is perception of the benefit of the behaviour; people experience the desired outcome of health. Women of childbearing age would practice good health habits before pregnancy to prepare to have a health outcome of a healthy mother and the newborn. Accordingly, the study used the HPM to promote the people to actively regulate, improve their behaviour and lifestyles during the preparation to conception. Individuals and couples will be more proactive to seek risk screening to infection that have impact to pregnancy, will practice HTSP to prevent complications of pregnancy that occur when pregnancy come too soon and too late. Therefore, the study will follow Pender's HPM to link the concept that PCC is an intervention that will promote health outcome of the mother and their newborn. Polit and Beck (2012:127) highlight that people will make a decision to comply with health behaviour like use of contraception, preventive health screening and take a good nutritious diet if they are able to perceive the desired outcome of the health behaviour benefit.

The conceptual framework that was learned from literature review on studies that have been conducted in developed countries is shown on Figure 2. Results have shown that PCC is vital to future parents and leads to change of behaviour and practices that produce a healthy outcome of pregnancy. Dean et al (2014a:3) provide a framework that can be used to guide the research to be conducted. The model illustrates that care and information given before and between pregnancies with the favourable environmental factors, essential health care services to adolescent girls and women enable good healthy outcome of mothers and babies. Essential services like appropriate birth spacing, healthy

diet, physical activity, immunisation and management of infectious diseases, genetic counselling and preventing and treating substance abuse would produce healthy outcome of mothers and babies. Figure 2.1 below shows the conceptual framework that the study followed.

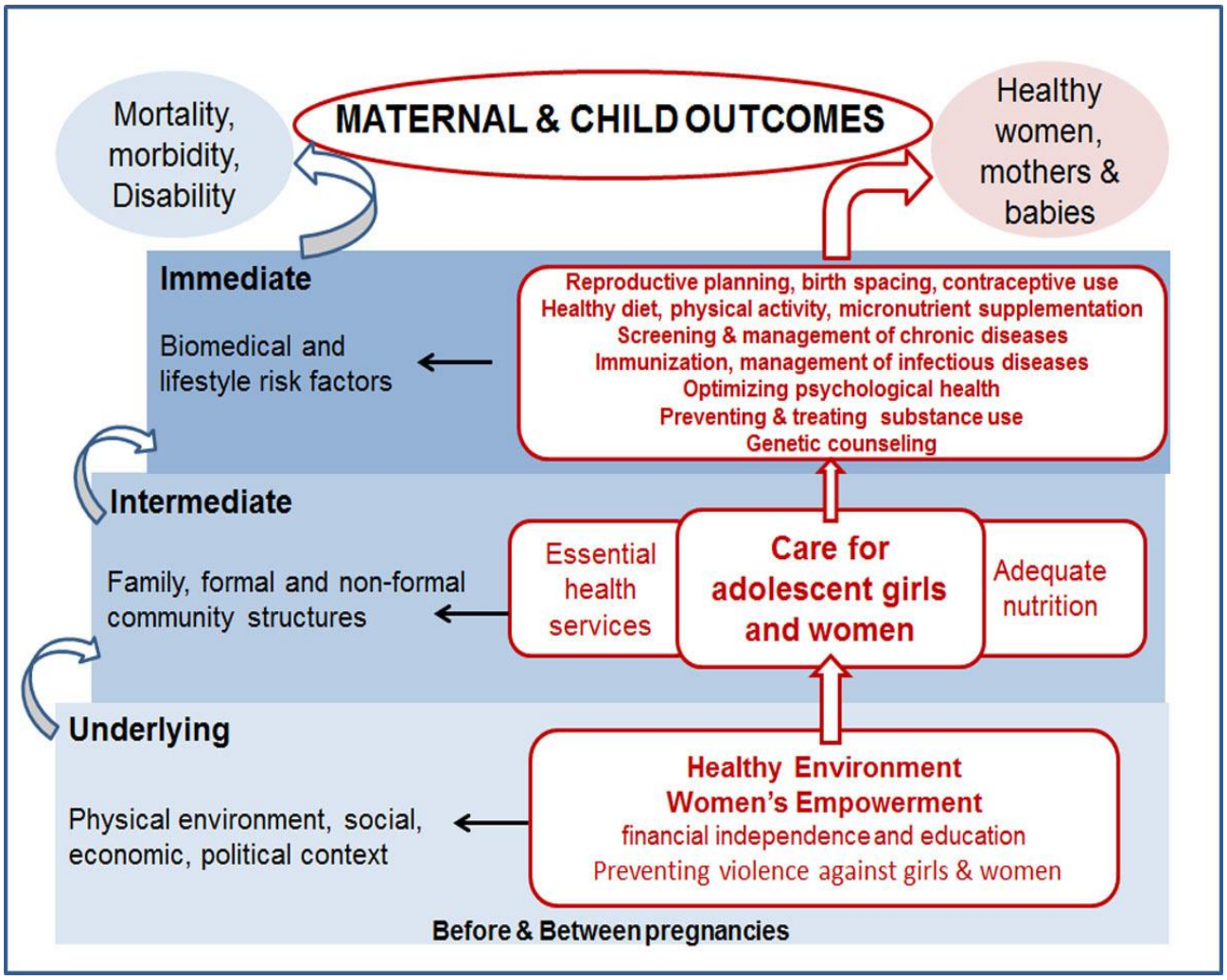


Figure 2.1: Conceptual Model underpinning the study

(Dean et al 2014c:4)

2.2 THEORY OF HEALTH PROMOTION MODEL

The study utilised the HPM by Pender who has a framework that can help health care providers to help client achieve improved health, enhance functional ability and have a better quality of life after adopting the PCC concept (Peterson & Bredow 2004:291). The HPM is straightforward and easy to understand and can be easily applied in the development of guidelines on PCC in Malawi (Peterson & Bredow 2004: 295). The model

is based on established theories of human behaviour, reasoned action, planned behaviour, and social cognitive theory. Pender's HPM was initiated in 1982 and has been revised in 1996 and 2002 according to (Peterson & Bredow 2004:292). PCC aims at prevention of health problems before they occur and avoidance of disease to have a healthy outcome of the mother and the baby. More importantly, the taking of folic acid during the preconception period prevents occurrence of neural tube defects on babies, which is a good example of health promotion among the people. Pender utilises HPM to individuals, family and community to have the potential to achieve goals set so that structural integrity is maintained and there is harmony with the relevant settings.

2.2.1 Pender's Health Promotion Model

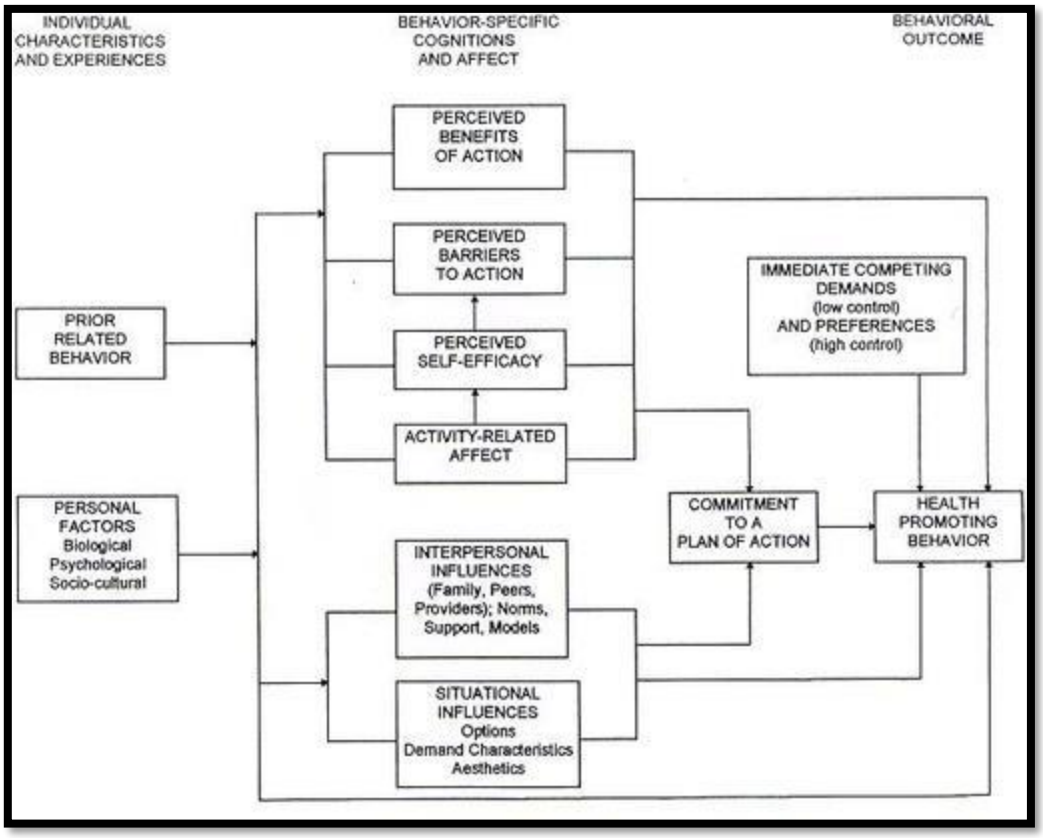


Figure 2.2: The Health Promotion Model

(Pender et al 2011)

The HPM is based on established three theories of human behaviour, including reasoned action, planned behaviour and social cognitive theory (Pender et al 2011:2). A person will intend to do behaviour when he or she believes that the outcome of that behaviour is desirable and can perceive the benefits, has control over the situation and has potential to successfully carry out an action. When a person has a belief that has high-perceived competence or self-efficacy in certain behaviour, it results in a greater likelihood that the person will commit to action and perform the behaviour. Peterson and Bredow (2004:291) assert that HPM is a competence-oriented approach that focuses on attainment of high-level wellness and self-actualisation. Glanz et al (2002:9) defined health promotion as any combination of health education and related organisational economic and environmental supports for behaviour of individuals, groups, or communities conducive to health. Health promotion is an art that influences individuals to improve their lifestyle facilitated by awareness, change in behaviour and create environments that support good health practices. The major motivational mechanisms for health promoting behaviour are: perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, interpersonal influences, and situational influences. All the perceived behaviours will lead a person to be committed to do a plan of action to achieve a health promoting behaviour. The guidelines and interventions on PCC would assist prospective parents to perceive the benefits of preconception health care that will make them to have the self-efficacy perceived to make them committed to a plan of action to achieve a desirable behaviour that focuses on attainment of self-actualisation (refer Figure 2.1).

2.3 COMPONENTS OF THE HPM

2.3.1 Individual characteristics

Peterson and Bredow (2004:291) and Pender et al (2011:3) illustrate the components of the HPM. The key components that affect human behaviour are the individual characteristics and experiences of the individuals, prior related behaviour, and personal factors. The prospective parents have experiences and specific individual factors like the age, socio-economic factors, psychological, and biological components that influence them to change their behaviours for the better.

2.3.2 Behaviour specific cognition and effect

2.3.2.1 Perceived benefits of action

This refers to perceptions of the positive or reinforcing consequences of undertaking a health behaviour (Pender et al 2011:4). Prospective parents will practice PCC if they are aware of the benefits of practising specific behaviours like screening for diseases and treatment before conception has a benefit of having a healthy outcome. Peterson and Bredow (2004:291) state that many adults engage in healthy behaviours with the intent of increasing wellness and avoiding illness.

In this study, the perceived benefits of action will be defined as awareness to practice behaviours during PCC that will assist to have a better outcome of pregnancy that is a healthy mother and baby. Some of these behaviours are seeking health care advice before conception, screening for diseases, getting prophylactic treatments like folic acid supplements and knowing HIV status of the couple.

2.3.2.2 Perceived barriers to action

There are perceived barriers to action if there are blocks, hurdles and personal costs of undertaking a health behaviour (Pender et al 2011:4). These are potential negative consequences of adopting the health promotion behaviour like prospective parents not using contraceptives because of the side effects that are associated with the medications. The perceived barriers in the study will be lack of availability of preconception guidelines that would assist health care providers to give recommended advice. Lack of knowledge of the patients to practice good health behaviours before conception like stopping use of alcohol, tobacco and other illicit drug.

2.3.2.3 Perceived self-efficacy

It is judgment of personal capability to organise and execute a particular health behaviour (Pender et al 2011:4). It entails self-confidence in performing the health behaviour successfully. If individuals have confidence that is capable to perform a specific behaviour, they are motivated to do it. The client would achieve controlled use of alcohol,

tobacco and other illicit drugs if they have the capability and self-confidence to practice the health behaviour. Peterson and Bredow (2004:291) highlight that Bandura's theory proposes that the greater a person's self-efficacy for a behaviour, the more likely that the person will engage in it even when faced with obstacles. A person is able to achieve a specific goal if is committed to accomplish the task.

In the study, if clients have self-efficacy to execute a given behaviour, they will be committed to practice PCC. Prospective parents will take initiative to seek for genetic counselling, immunisations, appropriate diet for them to have better pregnancy outcome.

2.3.2.4 Activity-related affect

An individual will act when there is subjective feelings or emotions occurring prior to, during and following a specific health behaviour (Pender et al 2011:4). During the health education sessions, clients would be motivated to practice health behaviours in order to have a pregnancy without complications. Moreover, using the nursing process will identify specific needs of an individual and appropriate plan would be made according to the individual needs (Peterson & Bredow 2004:295).

In the study, if prospective parents see the benefits of healthy timing and spacing of pregnancy will be motivated to space their pregnancies after two years and avoid late pregnancies after five years.

2.3.2.5 Interpersonal influences

Pender et al (2011:4) assert that interpersonal influences like family, peers, providers, norms, social support, role models – perceptions concerning the behaviours, beliefs, or attitudes of relevant others have an impact in regard to engaging in a specific health behaviour. These factors influence the individuals to perceive the appropriate behaviours. If peers with same norms and beliefs are able to practice PCC, the individual is motivated to follow the example.

In the study, if families, peers and significant others are role modelling in practicing PCC, prospective parents will be committed to engage in appropriate health promotion behaviour (Pender et al 2011:6).

2.3.2.6 Situational influences

Situational influences like options, demand characteristics, aesthetics, and perceptions of the compatibility of life context or the environment make individuals engage in specific health behaviour (Pender et al 2011:4). Other situational influences will expose individuals to engage in health behaviour. The HPM interventions should be tailored according to the unique characteristics of a person (Peterson & Bredow 2004:295). Health promotion involves the creation of conditions in which clients can express their unique human potential.

Situational influences in the external environment can increase or decrease commitment to participation in health promotion behaviour (Pender et al 2011:7). Lack of education, poor socio-economic status, and bad attitude towards good behaviour would hinder clients to practice PCC.

2.3.2.7 Commitment to a plan of action

Intentions to carry out a particular health behaviour include the identification of specific strategies to do so successfully. When individuals are committed, they will work hard to acquire a specific health behaviour. The HPM posits that a person is more likely to intend behave in a certain manner when he or she believes that the outcomes of the behaviour are desirable (Peterson & Bredow 2004:291). The HPM is about attainment of high-level wellness and self-actualisation, especially when PCC behaviours are practised. In the study, if prospective parents have greater commitment to a specific plan of action, the more likely health promoting behaviours are to be maintained over time (Pender et al 2011:7).

2.3.2.8 Immediate competing demands and preferences

Alternative behaviours intrude into consciousness as possible causes of action just prior to the intended occurrence of planned health behaviour. Some individuals will immediately act to adopt preconception health behaviours according to their demands and preferences. In the study, if there are greater positive emotions or affect are associated with behaviour, the probability of commitment and action is increased.

2.3.3 Behaviour outcome – health promotion behaviour

Pender et al (2011:5) define health-promoting behaviour as the desired behavioural end point or outcome of health decision-making and preparation for action. The individual characteristics and behaviour cognition and effect will bring a health behaviour outcome which in preconception health care will assist couples to have a healthy mother and baby.

2.4 CONCLUSION

The health care providers should identify individual characteristics and experiences to reinforce strengths of clients and build on their past successes and failures. Family, peers and friends can play an important role to provide support and role model clients to practice PCC. Set goals together with clients to achieve what has been planned in order for them to be committed to a plan of action. The HPM was used in the study to identify precocnception interventions that will improve pregnancy outcome on the mother and the baby.

CHAPTER 3

LITERATURE REVIEW

3.1 INTRODUCTION

The chapter discusses the literature reviewed on the studies that have been done in other countries about the provision of preconception health care that is one of the essential interventions in an effort to improve maternal and newborn health. The literature review focused on what is the package that is provided to men and women of the childbearing age to promote awareness related to healthy pre-pregnancy and pregnancy interventions that would yield improved maternal and newborn outcomes. The literature map will discuss preconception health care, inter-natal care, benefits of PCC, and interventions in PCC like nutrition supplements, health screening, behavioural change, family planning, HTSP and health planning of pregnancy. Some studies have indicated the adverse effects that would happen if couples have unplanned pregnancy. Frey and Files (2006:73) assert that the goal of PCC is done to identify medical and social conditions that may put the mother or foetus at risk. Lack of PCC and late entry into prenatal care are contributing factors to infant mortality and the literature review will examine how the concept of PCC has been adopted into the health care setting, barriers to developing and using PCC.

3.1.1 Purpose of literature review

A thorough literature review was done to gain insight on what are the recommended interventions and strategies that other places have used to ensure quality provision of PCC that improve maternal and newborn outcome. Polit and Beck (2012:120) argue that a good literature review requires thorough familiarity with available evidence to gain confidence to prepare a state of the art review so that the researcher can determine how best to make a contribution to existing evidence. In this study, the researcher needs to generate enough evidence that PCC has done to improve maternal and newborn outcomes in other settings. The best practices done in other settings can influence the developing countries like Malawi to consolidate interventions that are relevant to Malawi setting to have standardised quality PCC that would improve maternal and newborn outcomes. The information gathered was used by the researcher to make sense of the

findings.

It is important to synthesise and evaluate what other researchers have done on PCC and the benefits to learn on what has been done and implement in Malawi to assist to improve maternal and newborn outcome (Moule & Goodman 2009:137).

3.2 THE CONCEPT OF PRECONCEPTION CARE

PCC is maintenance of women's and men's health before conception so that some of the detrimental effects on pregnancy, maternal and neonatal health are prevented to have a health outcome. PCC includes any intervention to optimise a woman's health before pregnancy with the aim to improve maternal, newborn health outcomes (Dean et al 2014c:1; Dean, Rudan, Althabe, Webb Girard et al 2013:1). PCC has the potential to positively impact 208 million pregnancies worldwide each year but the challenge is that women in low and middle – income countries that have the highest burden of maternal and neonatal mortality do not access benefits of interventions (Dean et al 2013:2). Maternal health behaviours have had an impact to improve the health of the mother and the infant if done before pregnancy, whether it be a first pregnancy or between consecutive pregnancies (Steel et al 2015:2). Whitworth and Dowswell (2014:2) further report about a study conducted in Hungary that provided evidence that PCC assisted to identify infertile couples that were treated sooner, treatment of genito-urinary infections, genetic counselling, positive maternal behavioural modification which was associated with increased infant morbidity and mortality improved birth outcomes of infants. Weisman, Hillemenier, Downs, Feinberg, Chuang, Botti and Dyer (2011:2) further provide evidence that behavioural change interventions are effective in changing adverse pregnancy outcomes during pre-pregnancy period. There is increased evidence that PCC is effective in improving pregnancy outcome, especially if women and men of the childbearing age practice health behaviours.

The aim of PCC is to ensure that men and women of childbearing age have optimal state of physical and emotional health at the onset of pregnancy to ensure a healthy mother and baby after birth. Lynch, Squiers, Lewis, Moultrie, Kish-Doto, Boudewyns, Bann, Levis, and Mitchell (2014:149) suggest that preconception health and health care address risk factors, promote health and manage potential chronic health conditions that could affect maternal health, conception and foetal development. Appropriate health behaviours

practised by men and women who intend to get pregnant will reduce risks of having a baby with birth defect and low birth weight that is so common in Malawi now. The findings on a social campaign revealed that despite the knowledge of what a woman knows on what to do to have a healthy pregnancy, very few take action to engage in specific preconception health behaviours that would improve the outcome of pregnancy (Lynch et al 2014:154). The health benefits to mothers and babies if preconception health is practised are numerous despite some countries that have no guidelines to promote preconception health.

Preconception stress increased risk for preterm birth and small for gestation age status (Class, Khashan, Lichtenstein, Langstrom & D'Onofrio 2013:1311). PCC is essential as the results in Class et al (2013:1314) revealed that maternal preconception stress increases the risk for infant mortality and adverse birth outcomes in offsprings, as there was increase in infant mortality to women that experienced severe stress before conception. Therefore, Malawi should take an initiative to develop guidelines for the health workers and community interventions to impart relevant information to women and men intending to get pregnant to improve knowledge on PCC that will improve the outcome of mothers and babies. It is important to identify opportunities where health care workers like doctors, nurses, clinicians, dieticians and counsellors can engage in providing relevant information on PCC to prevent complications that would affect the mother and the baby at birth. There should be a shift to put more emphasis on pre-pregnancy intervention from prenatal care that is too late to reduce risk for foetal development (Weisman et al 2011:20), Whitworth and Doswell (2014:10; Waggoner 2013:1).

Thus far, findings suggest that there is convincing evidence that health problems like nutritional deficiencies like anaemia, obesity, vaccine preventable diseases like tetanus and mental health problems such as depression contribute to poor maternal and child health outcomes (Mason, Chandra-Mouli, Baltag, Christiansen, Lassi & Bhutta 2014:2). In addition, Mason et al (2014:2) also conclude that in low and middle-income countries, there is a need for public health care that would include PCC as a priority intervention to improve maternal and newborn outcome. There is evidence that tobacco, alcohol use, individual genetic condition, and environmental exposure to chemicals and radiation would affect maternal and child health outcome. Furthermore, Mason et al (2014:2) argue that if the problems outlined are addressed early before conception occurs, that could

improve health outcome of the mothers and babies. Congenital problems, neural tube defects, partner violence, and unintended pregnancies could be minimised if interventions like counselling, vaccinations and treatment are done on time before conception occurs. Several studies found that the research priorities for PCC have identified the following strategies to increase coverage of basic interventions to low and middle income countries like Malawi to address the basic intervention that would improve maternal and newborn income, namely, nutrition; reproductive planning for adolescents; contraception that is provided according to health timing and spacing of pregnancy; prevention; detection; and treatment of chronic conditions that affect maternal health, immunisation, diagnosis and treatment of infectious diseases and reducing harmful environmental smoke exposure. Mason (2014:3) highlights that the benefit of PCC could improve the health and social well-being of families as there is evidence that there could be reduction of maternal and childhood mortality and morbidity. PCC should incorporate male involvement that would support to address the priority interventions that would contribute to the health outcome of the mother and the baby. Frey, Navarro, Kotelchuck and Lu (2008:389) argue that male involvement in PCC can result in improved reproductive health practices and outcomes for women. In addition, Kabagenyi, Jennings, Reid, Nalwadda, Ntozi and Atuyambe (2014:2) note that despite the growing evidence that male involvement improves reproductive health decision making, there are still some gaps in sub-Saharan African countries on use of family planning services.

It is a fact that maternal health before and during pregnancy impacts the health of the child long after infacncy (Goodfellow, Frank, Mcfreer and Rankin 2017:1). There are potential barriers to developing and using PCC and policy implications related to nursing and midwifery practice like health literacy. Goodfellow et al (2017:7) highlight the importance of training of health care providers and non-health professions on PCC. Despite the literacy challenge, there is evidence that an encounter with a health professional prior to conception may positively affect the health of the developing foetus once pregnancy occurs. Education and implementation of health lifestyles during PCC would improve the health outcome of the mothers and the babies. Belizan, Hofmeyr, Buekens, and Salaria et al (2013:2) point out that all women of reproductive age should have access to PCC like preventing adolescent pregnancy, preventing unintended pregnancy, promoting optimal birth spacing, adequate nutrition during pregnancy, screening for health problems, and appropriate treatment prior to pregnancy. According to state of the midwifery report, it is said that comprehensive midwifery care should

include pre-pregnancy through to pregnancy, childbirth and postnatal (Day-stirk, McConville, Campbell, Laski, Gueerra-Arias, Hoope-Bender, Michel-Schuldt & De Bernis 2014:2).

3.3 BENEFITS OF PRACTICING PRECONCEPTION CARE:

The maternal, neonatal and child health interventions have a great impact in accelerating progress to achieve MDGs 4 and 5 which Malawi is still creeping behind to achieve. Achievement of the targets need interventions to be implemented across the reproductive life span starting from the pre-pregnancy period that is very crucial to yield a health outcome of the mother, the baby and the child (Lassi, Imam, Dean & Bhutta 2014a:1). There is evidence that PCC provided to men and women of the reproductive age would yield effective results to have healthy pregnancy outcomes that will instil families to be physically, socially, economically and psychologically stable. De Jong-Potjer, Elsinga, le Cessie, Van der Pal-de Bruin, Neven, Buitendijk, and Assendelft (2006:7) highlighted the importance of infoming all women of childbearing age to be knowledgable on PCC so that they can prepare for their pregnancy. There is evidence that health promotion interventions are associated with providing health outcomes of the women and infants after birth. Day-strick et al (2014) recommend that PCC will support the 10 pillars of midwifery 2030 whereby one of the pillars is that all women of reproductive age including adolescents have universal access to midwifery care across the birth continuum including pre-pregnancy phase. Blencowe, Cousens, Chou, Oestergaard, Say, Moller, Kinney and Lawn (2013:33) report that many women are unaware of how health before conception many influence their risk of having an adverse outcome of pregnancy. Women of the reproductive age and adolescents need to practice PCC that includes appropriate preconception weight, adequate nutrition, optimal birth spacing, prevention, and treatment of sexually transmitted diseases and HIV/AIDS, screening for chronic diseases that will prevent risks of having premature births, low birth weight on newborns and congenital abnormalities. Lassi, Kumar, Mansoor, Salam, Das and Bhutta (2014c:15) highlight the importance of family planning, and spacing pregnancy at appropriate interval, screening for chronic diseases and infections and preconception folic acid supplementation which have shown significant impact in reducing maternal and neonatal morbidity and mortality.

The current research priorities for PCC in low and middle-income countries are to focus on development and delivery of existing interventions during preconception period such us improving nutrition, contraception screening and treatment of chronic diseases and infections and reducing harmful environmental smoke exposures (Dean et al 2013:7). Salihu, Salinas and Mogos (2013:3) recommend that comparative effectiveness research should be done to identify interventions that would improve preconception health care in different settings of the people. Therefore, Malawi should have guidelines that will direct the provision of PCC to assist the reduction of maternal and infant morbidity and mortality so that interventions are relevant to the Malawian setting. PCC should be a priority strategy to improve maternal and child health in Malawi. In a review of some studies, Dean et al (2014b:31) found that if PCC is provided on time, it would promote women to have reproductive health plan, encourage use of exclusive breast-feeding and uptake of modern contraceptives.

3.3.1 Reproductive planning as an intervention during preconception care

Reproductive planning is one of the strategies to improve maternal and health outcome after birth as mothers conceive when it is the right time to carry a pregnancy that will facilitate the baby to grow well. Healthy Timing and Spacing of Pregnancy (HTSP) is an intervention to help women and families delay or space their pregnancies to achieve the healthiest outcomes for women, newborns, infants, and children. Schwandt, Skinner, Hebert, Cobb, Saad and Odeku (2017:1) highlighted that inadequate birth spacing is rated as riskier that all contraceptive methods. According to WHO (2014), there is a recommendation that women of childbearing age should ensure to have a period of 24 months passed in order to reduce the risk of adverse maternal, perinatal and infant outcomes. Lassi et al (2014b:2) contend that the short interval of less than six months is associated with higher risk of preterm births, low birth rate, foetal death, and small for gestation age compared to inter-pregnancy interval of 18 to 23 months and the risks were also higher in pregnancy conceived at more than 60 months. Optimally, spaced births have economic, social and demography significance and could potentially reduce foetal and maternal morbidity and mortality (Yakoob, Menezes, Soomro, Haws, Darmstadt & Bhutta 2009:3). A report on perinatal risk factors suggests that pregnancies should be well spaced as unintended pregnancies result in short-and long-term negative outcomes for both the mother and the baby. The developed countries, as some literature suggest, put emphasis on PCC that ensure that men and women of childbearing age have to

conceive when one is ready to get pregnant at the recommended time. Faye, Speizer, Fotso, Corroon and Koumtigue (2013:1) provide evidence that 14.3% of pregnant women reported having a recent unintended pregnancy that is associated with low participation of women in their reproductive goals and lack of discussion on family planning with their spouses.

Family planning is fundamental to prevent unplanned pregnancy that contributes to a lot of adverse effects of maternal and newborn outcome at birth. Tamang, Raynes-Greenow, McGeechan, and Black (2017:8) highlighted that reproductive health messages should be introduced to the youth as early as possible to prevent detrimental effects like teenage pregnancies. Unfortunately, a study done in Kenya, Uganda and Senegal revealed that only about 60% of the women of the childbearing age had unmet need for modern contraceptives due to social cultural barriers like male partner opposition (Okigbo, Speizer, Corroon & Gueye 2015:2). Media like radios, televisions outreach activities and religious leaders should target the men for increase uptake of modern family planning methods. Use of contraception during preconception period assist couples to have pregnancy when one is ready to conceive (Salam, Mansoor, Mallick, Lassi, Das & Bhutta 2014:10). Family planning messages should include preconception messages that would inform men and women of childbearing age to use contraceptives and have pregnancies when one is physically, socially and psychologically prepared to have a healthy outcome of pregnancy.

Advice should be provided to postpartum patients soon after birth to utilise family planning services that would assist them during internatal period. Bazile, Rigodon, Berman, Boulanger, Maistrellis, Kausiwa and Yamin (2015:9) conclude that for Malawi to improve maternal and neonatal mortality, one of the strategies to put in place to achieve the MDG goal 5 is by ensuring provision of contraceptive options to all women and men of reproductive age, including those residing in remote areas. A study conducted in Uganda showed that maternal and neonatal health care services were at 75% for antenatal services and 75% utilising postnatal services. However, there was only 50% utilisation of family planning services indicating that people of the reproductive age group do not fully use contraception options that would improve the mothers' and babies' health (Wilunda, Oyerinde, Putoto, Lochoro, Dall'Oglio, Manenti, Sagafredo, Atzori, Criel, Panza & Quaglio 2015:5).

A report written by Johnson, Posner, Biermann et al (2006) recommends that couples and individuals should reflect their personal intentions regarding the number and timing of pregnancies in the context of personal values and life goals to increase the number of planned pregnancies. Studies reviewed by Dean et al (2014b:23) showed that women who receive PCC may be more likely to plan and space their pregnancies. Closely spaced pregnancies predispose mothers to deplete their nutritional reserves and lead to anaemia, and increased chances of having stillbirths, premature rupture of membranes (PROM) and puerperal endometritis. The women that have closely spaced pregnancies have about 66% more chance to die during pregnancy than women that have pregnancies at recommended intervals. Children have the high chance to be born premature, low birth weight (LBW) and small for gestation age (SGA) (Dean et al 2014b:29). It is a risk as almost 1/3 of the pregnancies are intended and 1/5 end in abortion. Another risk factors associated with short intervals in between pregnancies include uterine rupture during trial of labour. Dean et al (2014b:31) provide the necessary period that women of the childbearing age should follow to have a healthy outcome. There should be 18 to 24 months in between the two pregnancies and women should not exceed five years long between pregnancies. Al-Akour, Sou'Ub, Mohammad and Zayed (2014:246) provided evidence that in Jordan half of the population of the respondents under study were aware that men and women need to have good health before conception to improve pregnancy outcomes.

Use of contraceptives assist couples to plan for pregnancy during preconception period as couples and individuals conceive when it is safe to carry pregnancy. Mustafa, Azmat, Hameed, Ali, Ishaque, Hussain, Ahmed, and Munroe (2015:8) reported that couple were accessing contraceptive very late due to lack of information for health care facilities. More importantly, family planning services should be available, accessible, affordable, and acceptable to couples of the reproductive age. Men should be aware of use of modern contraceptive to support their families to have healthy pregnancies as using PCC methods increase male involvement. Mohammed, Woldeyohannes, Feleke, and Megabiaw (2014:4) recommend that male involvement has an important role to support the use of modern contraceptives in a study done in Ethiopia. Women who discussed with their husbands about use of family planning methods were seven times more likely to use modern contraceptives than women that did not involve their spouses. Modern contraceptive use prevents preterm births, low birth weight, foetal death, and small for gestation age that occur owing to short inter-pregnancy interval if family planning is not

done. Exaggerated long intervals between pregnancies that come after 60 months or more are also associated with the outcome of pregnancy (Lassi et al 2014a:7). Pregnancies that are planned at appropriate intervals are expected to have minimal risks. It is therefore important to avoid unplanned pregnancies by promoting use of family planning during PCC. Arambepola and Rajapaska (2014:3) caution that many women are at risk of terminating their pregnancies that predispose them to more risk. Moreover, they do that for a number of reasons, namely, lack of income and social support, and psychological factors as some think are too old to carry a pregnancy or ashamed of a very short last birth interval. Dean et al (2014b:31) found that 90% of the childbearing women that receive post-abortion counselling used family planning services.

Family planning use is high if there is male involvement. Therefore, couples should be encouraged through proper communication to have better birth outcome if pregnancies come at the recommended time. Mason et al (2014:4) assert that both men and women should be targeted to access PCC as men's health and their health behaviours have important implications for the health of the partners and children. Families, couples and communities would plan their pregnancies if their male counterparts were involved in family planning. The women would participate in issues that affect them as they would make well-informed and well-considered decisions about fertility and health (Mason et al 2014:3). There is a worldwide problem of infertility problems that are affecting couples at present. Blaževičienė, Jakušovaitė and Vaškelytė (2014:1) found that women are assisted with new reproductive technologies for them to conceive. Screening for reproductive health problems would be provided in family planning clinic during preconception period for couples to identify and find assistance that need specialised care. PCC is an entry point where family planning methods can be provided and if there were challenges in conception, other ways would be instituted. Dean (2012:7) highlighted that there is ument need of contraceptive use in Sub Saharan Africa that would hinder adolescents and women of childbearing age to access PCC.

3.3.2 Screening for infectious and chronic diseases that affect maternal and infant birth outcomes

Couples intending to get pregnant need appropriate screening and treatment of diseases that would affect pregnancy. Mahmud and Mazza (2010:1) indicated that conditions like diabetes in pregnancy is associated with higher rate of miscarriage, preeclampsia,

preterm labour and fetal malformation. The clinical components of PCC include taking family history, behaviours, obstetric history, screening for diseases, genetic disorders and counselling on folic acid consumption, smoking, alcohol intake and nutrition history (Salihu et al 2013:2). It is possible to conduct a preconception risk assessment among couples of reproductive age. A research conducted by Gardiner, Hempstead, Ring, Bickmore, Yinusa-Nyahkoon, Tran, Paasche-Orlow, Damus and Jack (2013:7) indicate that almost all women thought that preconception risk assessment was useful to identify the risks before pregnancy like screening for sexually transmitted diseases, adequate nutrition during pregnancy and appropriate multivitamin supplementation with folic acid. Further qualitative study conducted in the UK revealed that younger women were less aware on preconception health and the women could know the prevention of smoking, alcohol and illicit drugs but could not see the importance of checking immunisations, medications, family history, ruling out diseases, and taking vitamin supplements prior to conceptions (Tuomainen, Cross-Bardell, Bhoday, Qureshi & Kai 2013:4). Folic acid supplementation was taken by any woman of reproductive age that decides to get pregnant in order to have the prevention of neural tube defects on the newborn babies in the US. This is one of the interventions that were done prior to conception in the 90s (Waggoner 2012:5). The Centre for Disease Control (CDC) had a summit with 35 countries to develop goals, recommendations and action steps to strengthen provision of preconception health to improve pregnancy outcomes (Posner, Johnson, Parkar, Atrash & Biermann & 2006:200). One of the recommendations was to strengthen the pre-pregnancy check up to couples and individuals planning to get pregnant so that are screened and treated on any diseases that have adverse effect to the pregnancy outcome (Posner et al 2006:202). Controlling known medical problems prior to pregnancy does not only helps to optimise the mother's health but it may also improve neonatal and paediatric outcomes (Curtis, Abelman, Schulkin, Williams & Fasset 2006:53).

3.3.3 Screening for Syphilis, Chlamydia and Gonococcal infections

PCC provides an opportunity when there is time to screen and treat infectious diseases that can affect the foetus in the utero. Lassi et al (2014a:5) underscore that increasing awareness to have screening and treatment of STIs and HIV will significantly promote newborn health. Prenatal care is too late to improve birth outcome because many of the interventions to prevent adverse maternal and infant outcomes are not administered soon enough to have an effect. Preconception and prenatal care together can improve perinatal

outcome, as mothers will conceive at the right time when the mother is in good health. Syphilis is caused by a bacterium called traponema pallidum that if the mother is not treated in pregnant, there is 100% chance to infect the unborn baby. There is also 50% chance that the infected baby would die shortly before or after birth. The baby that survives would have low birth weight, failure to thrive and even long-term neurological problems like blindness and deafness. The bacterium that has affected the pregnant mother has ability to cross the placenta and affect the unborn baby. Sagel, Krämer and Mikolajczyk (2011:1) explained that fetal infections and complications can be prevented by initiating screening programs which could be done before onset of pregnancy. It is important that couples and individuals intending to become prospective parents need to screen from transplacental infections that would affect foetal development. Chlamydia infections should be screened and treated as they could affect baby's eyes, ears and genitals. Gonorrhoea can be passed to the baby during childbirth and could affect the eyes of the baby causing gonococcal neonatorium that can lead to blindness. More importantly, PCC would prevent occurrence and treat these infections that affect newborn in the utero as well as at birth. Programmes should be put in place in countries like Malawi to provide PCC that would reduce neonatal infections that cause morbidity and mortality of infants.

3.3.4 HIV/AIDS screening and treatment during pre-pregnancy period

Efforts have been there to prevent HIV/AIDS transmission among couples and use of condoms as a dual protection has been used. Consistent use of the condom among couples was to prevent HIV/AIDS, STIs and unwanted pregnancies. However, a study conducted by Sopheab, Tuot, Chhea and Gorbach (2015:2) highlight that there is inconsistent use of condoms, which predisposes women of the childbearing age to be at risk of HIV/AIDS, STIs and unwanted pregnancies. Most of the unborn babies are susceptible to acquire the HIV/AIDs virus, STIs while in the uterus. Dunlop, Dretler, Badal, and Logue (2013:61) reported that couples that did not use a condom during a sexual encounter were contracting STIs that would affect the pregnancy outcome. It is a fact that HIV/AIDS and STIs screening and early commencement of antiretroviral therapy (ART) to patients that are intending to get pregnant would reduce the chances of passing the HIV to the unborn baby. Kendall, Danel, Cooper et al (2014:250) state that women in sub-Saharan Africa are approximately eight times likely to die during pregnancy owing to untimely initiation of ART. Ng, Macdonald, Loutfy, Yudin, Raboud, Masinde, Bayoumi,

Tharao, Brophy, Glazier and Antoniou (2015:6) reported that HIV positive women were initiated early on prenatal care but it would be better to counsel them during the PCC period to improve the outcome of pregnancy.Initiation of ART to all women before pregnancy would prevent mother to child HIV transmission.

Screening and early treatment PCC in childbearing women would assist to reduce maternal mortality and morbidity. Tuberculosis, malaria, pneumonia and sepsis are among the leading causes of maternal death in women that are living with HIV (WLWH) (Kendall et al 2014:251). Prospective parents should be provided with appropriate information that screening for HIV/AIDS during preconception period would assist them to have an informed decision to be pregnant. Chances to transfer the virus to the unborn baby is minimal in WLWH that are pregnant are commenced on ART as early as possible (MoH 2011:8). Malawi is a country that has opted for option B+ whereby if a pregnant mother is HIV positive starts ART immediately to protect the unborn baby from acquiring the virus. This protocol can be well implemented if patients report for counselling during preconception period. It has been noted that in Malawi, pregnant women are screened for HIV/AIDS when they are already pregnant in their second trimester which is very late to prevent the pregnancy or to commence on ART to prevent parent to child transmission.

Preconception counselling should be compulsory to couples and individuals that are tested HIV positive and are intending to become pregnant. Obstetricians, nurse midwives, clinicians, and counsellors must provide information depending on a couple's needs on care of HIV/AIDS positive patients choosing to get pregnant. Couples and individuals intending to get pregnant need to be informed about good adequate nutrition, screening for other STIs, good health habits like no smoking, no alcohol, use of unprescribed drugs and have a support network to achieve a healthy pregnancy outcome. According to Malawi standard guidelines, any pregnant woman should start ART immediately. Preconception counselling would provide appropriate information that a woman would conceive if the woman on ART has a viral load of 500-1000 copies or more. Pregnancy is not recommended if the threshold is below requirement. In Malawi, an ambitious programme of life-long HAART for all HIV-infected pregnant women regardless of CD4 cell count has been introduced to prevent HIV, MTCT for current and future pregnancies and to improve maternal health (Taha, Debabhai, Rahmen, Sun, Kumwenda & Kumwenda 2012:2). A pregnant mother already on ART has reduced risk for perinatal transmission. Therefore, Malawi guidelines recommend that all pregnant mothers should

be on ART regardless of CD4 count and viral load. Patients during preconception period should be provided with appropriate information on the benefits of screening for HIV/AIDS before conception, options available to keep health when HIV positive and complications of pregnancy with HIV/AIDS.

Ebrahim, Lo, Zhuo, Han, Delvoye and Zhu (2006:37) reported that in China, there has been an increase of couples on pre-conceptional HIV testing and counselling from 38% to 62% over one-year period as the health examination is mandatory to protect the couples and the unborn baby. The information provided during counselling phase will assist prospective parents to have an informed choice and plan ahead to protect the health of the mother and the newborn.

3.3.5 Screening for chronic diseases

Chronic diseases like diabetes mellitus, hypertension, anaemia, cardiac diseases, respiratory diseases, epilepsy, cancer, malaria and many others also affect men and women of the reproductive age indicating that their pregnancy outcome is affected. Chronic diseases assessment before the onset of pregnancy should be managed to prevent adverse outcomes of pregnancy owing to its effects (Dean et al 2013:7). Dunlop et al (2013:56) reported that women with chronic medical conditions have more complications to the mother and the fetus. It is important for these at-risk groups to have proper counselling and management of their conditions before conception to ensure a healthy outcome of pregnancy. Bombard, Robbins, Dietz and Valderrama (2013:1) emphasized the importance of encouraging women to practice health life styles before conception and screening of diseases like hypertention to reduce adverse effects during pregnancy. Prior to having a pregnancy, couples should be in optimal health to support life of the unborn baby. Uncontrolled chronic diseases have detrimental effects to the outcome of pregnancy to both the mother and the baby (Lassi et al 2014a:2). Vinturache, Moledina, McDonald, Slater and Tough (2014:2) highlighted that obesity is associated with increased complications during pregnancy, labour, delivery and postpartum period. Recommendations that were provided in a summit on PCC resolved that all women of the childbearing age have to receive PCC services, screening for chronic diseases so that pregnancy begin when one is in optimal health (Posner et al 2006:199).

A qualitative research conducted by Tuomeinen et al (2013:4) stated that women of the childbearing age were able to know that alcohol, tobacco and illicit drugs are dangerous but did not comprehend the importance of accessing health care services to have cervical smears, risk assessment for diseases, treatment review before pregnancy. There is a need for awareness to have a thorough check up to rule out any chronic diseases and their treatment that could have adverse effect towards pregnancy. PCC could be provided at primary care level so that couples are screened of the health problems that would affect them (Tuomeinen et al 2013:4). At primary level of health provision, PCC offers an opportunity to address risk factors that would affect prospective parents throughout the life span (Salihu et al 2013:1). Mason et al (2014:6) conclude that if PCC is practised medical costs will be minimised as the complications that would have developed are controlled before occurrence. Most people like to consult the health care providers when complications occur which is costly. Health assessment conducted on prospective parents is beneficial to prevent complications that would occur. Even in the western world there is at least 20% of adverse effects of pregnancy like miscarriage, stillbirth, pretermbirth, low birth weight or congenital abnormality (Elsinga, Van der Bruin, Le Cessie, De Jong-Potjer, Verloove-Vanhorick and Assendelft 2006:2).

3.3.5.1 Anaemia

In Malawi, one of the common causes of preterm birth is anaemia that is resulting from poor nutrition, malaria and hookworm infestation (Van den Broek, Jean Baptiste and Neilson 2014:3). If PCC is provided in Malawi, there will be prevention and control of the causes of aneamia on all women of the childbearing age to improve the birth outcome. Malawi is providing insect treated nets and providing anti-malarial drugs to pregnant mothers that are infected very late during conception. In order to prevent preterm births, couples should be informed to have adequate nutrition and control prevalence of aneamia, especially in Malawi. Women of childbearing age should have haemoglobin content checked before conception and encouraged to have adequate nutrients that prevents aneamia.

3.3.5.2 Malaria

A study conducted in Thailand revealed that one among the three causes of maternal deaths is malaria caused by plasmodium falciparum (Mcgready, Boel, Rijken et al

2012:5). Malaria that influences the haemolysis of blood and leading to anaemia in childbearing women would be controlled even before conception to have a better birth outcome of the mother and the baby. Women of childbearing age should institute prevention measures to control occurrence of malaria like use of insecticides, treated nets and keep the environment free of mosquitoes. Prospective parents should ensure that malaria is controlled before conception.

3.3.5.3 Diabetes

One of the common conditions affecting pregnant women is diabetes. Controlling diabetes before onset of pregnancy is one of the interventions that reduce the occurrence of congenital malformations by 70% (Lassi et al 2014a:1). Dean et al (2014:287) reveal that infants of women with pre-existent insulin dependent diabetes mellitus had a tenfold greater risk of congenital malformation and fivefold greater risk of being stillborn than infants from the general population. Lassi et al (2014a:1) also illustrate that women of reproductive age in low and medium income countries (LMICs) have diabetes and there are greater number of pregnancies that present complications both to the mothers and the foetus.

Glycaemic control and modified diet to control blood sugar during pregnancy by women of the childbearing age is one of the interventions during pre-pregnancy period to have a healthy mother and the baby. Lassi et al (2014a:2) further provide evidence that diabetes in pregnancy is associated with increased risk for miscarriage, still born, macrosomia and obstetric complications, intrauterine growth retardation and some growth complications. Dean et al (2014:287a) further explain that the prevalence of type 2 diabetes is ever increasing worldwide including in Malawi which is one of the LMICs. Diabetes increase morbidity and mortality among the mothers and their babies. Lifestyle diseases like diabetes is one of the conditions that are becoming common in Malawi and it will inevitably affect the women of the childbearing age. Hereditary factors, diet and lack of activity are contributing to the women of the childbearing age to have diabetes. It is essential that the women of the childbearing age should be checked for diabetes before conception to have the blood sugar levels controlled before the pregnancy. A diabetic mother has 3 to 12% chances to give birth to baby with congenital malformation like sacral agenesis, complex cardiac defects, and spina bifida. Diabetes condition that is not controlled during pregnancy could lead to premature delivery, low Apgar score and perinatal mortality

(Denktaş, Jong-Potjer, Waelput et al 2012:58). Johnson et al (2006) provide recommendations that improvement of preconception health and care among mothers that are diabetic will reduce occurrence of birth defects among infants of women with Type 1 and Type 2 diabetes. Prospective parents should access risk screening and health promotion to prevent chronic conditions like diabetes, heart diseases and others.

Dean et al (2013:7) added that the only solution to prevent adverse effects of diabetes in pregnancy is by providing PCC. Denktaş et al (2012:108) further points out that the critical period to control diabetes is during organogenesis when the foetus is developing during early in pregnancy. Glycaemic control should be conducted before conception to yield a healthy pregnancy. Preconception counselling on chronic diseases like diabetes whereby there is intensive insulin therapy, glycaemic control on diet and activity has resulted in improvement of life style behaviour to the patients. Denktaş et al (2012:122) and Dean (2014a:288) emphasise that couples or women that are affected with diabetes and wants to conceive need appropriate counselling to have the glycaemic reduction, review if there are complications like retinopathy or nephropathy, drug compliance and adhere to health care messages to prevent alcohol or tobacco consumption. Diabetes control is one of the preconception interventions that have provided evidence to improve maternal and neonatal outcomes of pregnancy. Risk factors are identified early and modified before conception. Every mother of childbearing age, adolescents, and prospective parents should be aware of the preconception screening and counselling on chronic condition like diabetes that would affect pregnancy. Lassi et al (2014a:1) and Dean et al (2014a:297) conclude that PCC that includes diet counselling, weight management, exercise, family planning, and stringent glycaemic control on women with pre-existing diabetes is effective to control congenital malformations, perinatal mortality, and maternal outcomes like preterm labour. In developed countries, only about 30% of the childbearing women come for PCC. In addition, Dean et al (2014a:509) maintain that every office visit of every female diabetic adolescent or woman of the childbearing age should be regarded as a preconception visit. There is a need to sensitise the communities to access PCC that is timely and costly to prevent adverse effects of pregnancy from chronic diseases like diabetes. At present, there are no guidelines or policies stipulated to the provision of PCC in Malawi. Women usually have unplanned pregnancies and problems are identified when conception has already taken place.

3.3.6 Genetic counselling during preconception period

Genetic disorders can be identified before conception to prevent adverse effects to pregnancy. Couples should undergo genetic counselling to identify factors that could affect both the mother and the baby during pregnancy. Dean et al (2013:7) state that detection and treatment of chronic conditions that affect maternal and newborn health should be identified before conception to improve the pregnancy outcome. Mason et al (2014:5) highlight evidence-based interventions that address health problems that could arise owing to genetics. A thorough family history should be scrutinised to identify risk factors that would affect pregnancy from both parents (Tuomainen et al 2013:6). Conditions like diabetes, epilepsy and hypertension could run in the family history and would be treated or controlled for one to have a health outcome. Appropriate screening should be conducted to determine the laboratory tests that could be done for the genetic counsellor to provide the needed advice. Some of the risks could arise from environmental factors that would contribute to poor maternal and child health outcomes (Mason 2014:2). In addition, Posner (2006:204) states that the vision for preconception health and pregnancy outcome is that all women of childbearing age need to be screened prior to pregnancy.

3.3.7 Nutrition during preconception period

Preconception nutrition is vital for mothers that prepare for pregnancy to have a healthy outcome of the mother and the baby. Mason et al (2014:4) suggest that the interventions to deliver PCC is by ensuring nutrition monitoring and education and provision of supplement foods to reduce the condition where women of childbearing age are underweight making them to experience adverse effects when pregnant. Most mothers in Malawi experience micronutrient deficiencies during pregnancy owing to several factors. These include lack of food that can provide necessary nutrients, knowledge deficit to have appropriate nutrients in pregnancy, cultural influences and inadequate income that would enable pregnant women to have appropriate nutrients. A systematic review conducted by Dean et al (2012:201) revealed that prepregnancy underweight poses major perinatal risks like stillbirths, preterm births, SGA and LBW among infants that are born. Women that are undernourished and become pregnant with the Body Mass Index (BMI) of less than 18 kg/m2 at conception are at risk of being malnourished throughout the pregnancy period. Huang, Ji, Zhao, Hu, Yang and Chen (2016:1) highlighted that

underweight women, and those that have excessive weight gain have a high risk of having preterm birth. Underweight is <18.5 kg/m^2 and overweight is 25.0–29.9 kg/m^2 while obese is 30.0 kg/m^2. It is important to calculate the BMI of women of reproductive age at any contact so that risks should be ruled out that can occur with pregnancy like gestational hypertension, diabetes mellitus, post-partum haemorrhage, and congenital heart defects. BMI before pregnancy should be normalised to prevent adverse effects on the pregnancy outcome. Very little information is provided to women of the childbearing age to improve on nutrition during PCC from health care providers as most of the information is provided by family or other health care providers like naturopaths (Mazza, Chapman & Michie 2010:3).

During conception, the mother needs to have appropriate nutrients in her body to sustain the healthy development of the foetus. Dean et al (2012:202) conclude that pre-pregnancy underweight significantly increases the risk of preterm birth by 32% and increases the risk of SGA babies by 64%. Furthermore, Demont-Heinrich et al (2013:237) highlight that women who did not gain enough weight during pregnancy were four times more likely to have very low birth weight infants compared to women who did gain enough weight. Conception that occurs when the mother is undernourished leads the foetus to be at risk of intrauterine growth retardation and baby being born with low birth weight of less than 2.5 kg. Maternal nutrition is vital for foetal development, especially in the first five weeks of conception to assist in the development of the foetal parts. Adequate preconception maternal nutrition status is considered of key importance during organogenesis and placentation.

Poor maternal nutrition intake during pregnancy has been associated unhealthy pregnancy outcomes. Posner (2005:2) compiled recommendations by the National Summit on PCC where it was resolved that there should be consumer awareness about PCC to include that mothers intending to get pregnant to have appropriate diet to improve the pregnant outcomes. Tuomainen et al (2013:8) conclude that women of the childbearing age should develop the culture of preparing for pregnancy as part of life to improve nutrition of pregnancy that would improve pregnancy outcome. It is important that the mother should be healthy during the pre-pregnancy period to have a healthy outcome of the foetus. Under-nutrition during pregnancy puts the health of the mother and the baby at risk to have anaemia, preterm births and multiple congenital anomalies like neural tube defects and skeletal problems of the foetus. Mothers that have iron

deficiencies have babies that experience intrauterine growth retardation, low birth weight and small for gestation age. Basic intervention during preconception period should include improving nutrition to improve pregnancy outcome (Dean et al 2012:7).

Mothers that are overweight during pregnancy are at risk of complications like gestational diabetes and hypertension that have adverse impact to the outcome of the pregnancy. Preconception nutrition advice would assist women of the childbearing age to have the recommended nutrition before becoming pregnant to improve pregnancy outcome. Dean et al (2012:204) underscore that overweight of women of the childbearing age is highly associated with increased risk of gestational hypertension, preeclampsia, gestational diabetes, and postpartum haemorrhage. Perinatal outcomes that are associated with maternal overweight before conception include macrosomia, LGA babies, and congenital defects. To overweight women, the intervention that can improve the weight is by maintaining a calorie-restricted diet and increase physical activities during pre-pregnancy period. Mumford (2014:2) suggests that nutrition through weight control is a component that can be provided during PCC.

Both pre-pregnancy overweight and underweight are risk factors for poor maternal and child health outcomes. Therefore, it is important to develop strategies that will reduce the risks. There is evidence that a change in diet by adding micronutrients, proteins and energy in Bhutanese refugee camp reduced the rate of LBW babies from 16% to 8% over a period of two years (Dean 2012a:224). Findings by Chavarro, Rich-Edwards, Rosner and Willett (2007:1054) highlight that modified fertility diet and its adherence were associated with a substantially lower risk of infertility. This indicates that diet that provides adequate nutrients contribute to couples to have healthy reproductive outcome.

Improving women's eating behaviours should begin as early during reproductive years. Provision of micronutrients should be part of routine PCC. Some of the developed countries have already introduced the supplementation of folic acid to women of the childbearing age to be taken during preconception period so that neural tube defects (NTD) are prevented among infants. Temel, Erdem, Voorham, Bonsel, Steegers, and Denktaş (2015:10) indicated that even in developed countries like Netherlands the use of folic acid during the preconception period is very low. Dean et al (2012a:1) observed that despite the health care system providing folic acid supplement, less than half of all women regularly consume folic acid supplements around the time of conception. The use of folic

acid three months before conception reduces the risk of first occurrence and recurrence of NTD (Lassi et al 2014c:8).

All women of the childbearing age should consume 0.4 mg of folic acid per day for the purpose of reducing the risk of babies being born with NTD. The challenge in most of the developed countries is that there is no awareness to women of the childbearing age to practice PCC. In most of the developed countries, folic acid has not been used to control NTD as PCC is not usually implemented in the health facilities. More importantly, women that have given birth to children that have NTD need a high supplementation of folic acid as there is evidence that it prevents NTD as well as cleft lip and palate as well as miscarriage (Dean et al 2012a:243). Provision of folic acid can be supplemented by fortification of some food. Iron deficiency anaemia is one of the problems faced by women of childbearing age and it is recommended that women during preconception period should have iron and folic acid. Dean et al (2014b:5) explained that many women of the childbearing age enter pregnancy with depleted nutritional reserves owing to micronutrient deficiencies, which can improve if PCC is provided. Folic acid supplementation should be taken by childbearing women that intend to conceive within six months. Agricola, Pandolfi, Gonfiantini, Gesualdo, Romano, Carloni, Mastroiacovo, and Tozzi (2014:2) contributed that having a preconception visit during a follow up increased in folic acid supplementation that would improve pregnancy outcomes.

3.3.8 Psychological preparation during preconception period

Psychological well-being of the mother during the pre-pregnant period plays an important role to have a healthy outcome of the mother and the baby (Dean et al 2014a:2). Class et al (2013:1) assert that mothers who had stress prior to pregnancy had high chances of their babies not surviving. Maternal stress is related to infant mortality. Mothers that experienced maternal mental health were associated to have stillbirth or low birth weight child. Preconception stress may affect the mother for several months and during conception, it will affect foetal development especially the process of organogenesis. Mental health problems can originate from reproductive health issues like unplanned pregnancies, stillbirths and abortions. It is important for prospective parents to have well-planned pregnancies and have conception when one has optimum health. In this case, PCC plays a significant role to improve the psychological status of the parents and contribute as well to have good pregnancy outcomes (Stotland 2010:7). Although studies

have shown that pregnancy period is associated with psychological well-being but high anxiety levels in pregnancy has led to harm to the foetus and adverse effects to obstetric outcomes. It has also been found that mothers with less physical activity and poor psychological well-being are obese and have poor obstetric outcome (De Wit, Jelsma, Van Poppel, Bogaerts et al 2015: 2). Good mental status plays a big role to have a healthy outcome. During PCC, women need to acquire good health practices that empower them to be healthy and have uneventful pregnancy with a healthy outcome.

Another factor that can affect the mental well-being of the pregnant women is having social support system that provides psychological care. Members of the family, spouse, friends and significant others play a big role to support a pregnant woman. Liu, Setse, Grogan, Powe and Nicholson (2013:2) maintain that social support system is vital to pregnancy as mothers that have good support network have better pregnancy outcome. During preconception period, pregnant mothers need adequate preparation before pregnancy to have the social support network that has a good influence for the mothers to have psychological well-being during pregnancy and have a healthy outcome of the mother and the baby. Debiso, Gello and Malaju (2015:4) observed that men had some knowledge on birth preparedness and complications of pregnancy, which could also be a window to introduce preconception care to prevent adverse effects of pregnancy.

3.3.9 Use of illicit drugs during preconception period

Women of childbearing age that intend to conceive are at risk of use of over the counter medications that would have teratogening effect during conception and pregnancy. Lester, Andreozzi and Appiah (2004:5) indicated that women of childbearing age access drugs like alcohol, tobacco and illegal drugs that cause teratogenic effects to the fetus. The chemicals from drugs would lead to adverse effect or harm to the developing child and a condition of fetal alcohol syndrome that cause slow growth, damage of the nervous system and mental retardation. Alcohol taken during preconception period and pregnancy poses more adverse effects to both the mother and the baby. Floyd, Jack, Cefalo, Atrash, Mahoney, Herron, Husten and Sokol (2008:333) further provided evidence that women of the childbearing age that were sexually active did not use family planning methods and became pregnant without realising it and continued alcohol use during the first trimester when the foetal organ systems are formed. Women of childbearing age are at risk of using drugs that would affect the unborn child or affect the birth outcome. Corchia and

Mastroiacovo (2013:3) observed that in the past health providers would not consider factors during the preconception period to affect pregnancy. It is important to have the history of the past social practices that would affect pregnancy.

There are many effects of tobacco on pregnancy. Women that use tobacco smoking during pregnancy are at risk of placenta previa, abruption, and premature rupture of membranes, preterm delivery, foetal growth restriction, and low birth weight (Floyd et al 2008: S333).

Consequencies of drug use before pregnancy on mother has some effects on the baby outcome. Das (2016:1) explained that drugs like marijuana, cocaine and alcohol can pass to breast milk and affect the baby. Some of the effects of drugs to the unborn baby are: feeding problems, tremors, withdraw syndrome and long-term behaviour problems. Prospective parents should refraine from drug use to have better outcomes of the baby.

3.3.10 Internatal care

PCC can be provided during internal care that is health care provided to a woman and her family from birth of one child to birth of the next child (Lu, Kotelchuck, Culhane, Hobel, Klerman & Thorp 2006:107). The mother needs appropriate period to time the next pregnancy to have a healthy outcome of the mother and the baby. Lu et al (2006:107) maintain that strong evidence is increasing regarding the use of early adequate prenatal care has not led to a significant decline in low birth weight or prematurity, which are leading causes of infant mortality in the United States. Prenatal care is usually too late or too little is done to improve pregnancy outcome. Effort to improve pregnancy outcomes includes promoting maternal health before and between pregnancies across the woman's life span hence the importance of preconception and internal care. Caskey, Stumbras, Rankin, Osta, Haider and Handler (2016:1) reported that postpartum women are at high risk of unintended pregnancy as do not receive timely postpartum contraception.

Even in Malawian setting, internal care would be an opportunity for wellness promotion between pregnancies as postnatal care is usually terminated after six weeks of delivery. Malawi generally has a low turn up of postnatal care. According to MDHS (2010:112), most Malawian mothers (about 48%) do not attend postnatal care owing to various reasons. Only 7% of the women that have delivered receive first postnatal check-up

between 3 to 41 days after delivery. Usually, the educated and wealthier mothers are able to attend postpartum care in Malawi. Poor postpartum attendance by the women in Malawi poses a very big challenge for women to access preconception and internatal care as there is no opportunity to assess for risk factors that would affect the next pregnancy outcome. Information and education is not provided to men and women of the childbearing age to take precaution measures that would improve outcome of the pregnancy. Lu et al (2006:109) findings provide a recommendation if the current visit at sixth week postnatal visit would increase to three or more inter-natal visits at two weeks, then six weeks, six months with an annual follow-up every year. Risk assessments would be conducted during the visits as many women might look healthy after delivery without major postpartum problems (Davidson, London, Ladewig & Davidson 2012:224). Consequently, health care providers may overlook some medical, behavioural or psychological problems.

Some of these problems that would affect the next pregnancy could be family violence, infections, nutritional problems, depression, stress, and chronic medical problems that could be sorted out during inter-natal visit. Prior risk assessments conducted before pregnancy would help to improve pregnancy outcome. Dibaba (2013) recorded that shorter birth intervals increase the risk of infant death.

3.3.11 Overview of use of PCC in Malawian context

There is a lot of effort to reduce maternal and neonatal mortality rate in Malawi. There are a lot of strategies that are instituted but most of them do not include preconception care strategies. Most of the strategies addresses the problems encountered during pregnancy. Kumbani (2006:1) highlights several approaches to improve and promote quality maternal and newborn health through family planning services, Focused Antenatal Care (FANC) and emergency obstetric care (EmOC). Very few strategies and interventions are addressing PCC. Ministry of Health (2011:7) in a document on Road Map to accelerate the reduction of Maternal and Newborn health highlighted strategies like family planning, access to health care facilities when pregnant and community mobilization but very few interventions were stipulated that could be done during PCC period. Most of the interventions are done very late when one is already pregnant. There is need of studies to be conducted to identify some innovative strategies that are effective and affordable in both urban and rural areas to improve maternal and newborn health. PCC should be one

of the strategies that should be available in Malawi health care facilities to improve maternal and newborn outcome.

Currently some of the components of PCC are not available like preparation for pregnancy, risks assessment of chronic and infectious diseases, use of folic acid to prevent nueral tube defects and genetic councelling before conception. The fertility rate in Malawi is now at 4.4 children per family (MDHS 2015-19:5). Women of childbearing age between 15-49 are vulnerable to aneamia, malaria, HIV, STI and stunting. One third of childbearing women have aneamia and vulnerable to malaria and prophlaxis of ferrous sulphate and Fansidar is only provided to pregnant women (MDHS 2015-16:11). The prevalence rate of HIV is 8.8% on population of 15-49 years of age. MDSH (2015-16:13) stated that 30% of the men use a condom and have more sexual partners. There is 7% of women that are thin <18.5% while 20% of the women are overweight or obese with BMI >25.0. It is also a fact that women in urban households are more than twice overweight than rural. The above health statistics justifies the need for PCC as pregnancy outcomes from the above health indicators could be compromised. There is need to have preconception strategies that could improve maternal and newborn outcome in Malawi.

3.4 CONCLUSION

The chapter has summarised literature that is related to provision of PCC to other countries. There has been strong evidence that PCC is vital to improve the maternal and child well-being. Specific components of PCC have been provided and the study has some direction to collect relevant information that will assist to develop the guidelines and strategies for provision of PCC in Malawi. Utilising the HPM will guide the study to investigate factors that would assist the families, communities, couples, and individuals to practice health promotion behaviours that will assist to reduce maternal mortality rate.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

This chapter outlines the methodology that was used for the study. It includes research design, setting of the population, sampling techniques, sample size, data collection plan, procedures to use, validity, and reliability of the research instruments. The research used quantitative research that involved the use of structured interviews conducted to men and women of childbearing age intending to get pregnant. The information provided had been analysed to get the care and advice the people within childbearing age receive as they prepare to conceive. Finally, there will be guidelines that will be developed for Malawi to provide PCC that will improve the maternal and newborn outcome.

4.2 RESEARCH OBJECTIVES

The research objectives were to

- explore and describe the level of knowledge women of childbearing age have on HTSP/PCC
- explore and describe the level of knowledge men of childbearing age have on HTSP/PCC
- establish the time when information about HTSP/PCC is provided to prospective parents that intend to get pregnant
- assess a relationship between the PCC information provided with the age of the mother, education level, parity, intended pregnancy and socio-cultural factors of the mother
- develop relevant preconception strategies that would assist to improve maternal and newborn outcomes in developing countries

4.3 RESEARCH DESIGN

The appropriate design to match the study was a quantitative exploratory cross sectional descriptive research. Polit and Beck (2012:184) illustrate that cross-sectional studies are appropriate for describing the status of the phenomena at a fixed point in time. In this study, these refer to behaviours and practices of the people of childbearing age between 18 to 35 years do before conception. Polit and Beck (2010:236) maintain that the purpose of descriptive studies is to observe, describe and document aspects of a situation.

Descriptive research was used to determine the practices people do before conception. The purpose of descriptive studies is to observe, describe and document aspects of a situation as it naturally occurs (Polit & Beck 2012:226). The research design does not require manipulating the variables and no attempt was done to establish the causality. Data were collected at particular place at the same period from a cross sectional sample that would use PCC. More importantly, the descriptive correlational study made the researcher to describe relationships among variables without attempting to infer causal connection. The researcher described the relationship between getting appropriate information and care about PCC and relate to the practices in pregnancy that would assist to achieve a healthy pregnancy outcome (Polit & Beck 2010:236). The data were collected from the prospective parents in relation to the care and information they received that would assist them to have a healthy outcome of the mother and the baby.

The subjects comprise men and women of childbearing age intending to get pregnant. In addition, Burns and Grove (2005:240) posit that the purpose of descriptive correlational design examines the relationships that exist in a situation, as many interrelationships will be identified in a short time. In this study, associations between variables were described like to determine if couples and individuals would change their lifestyles if information and care were provided before conception. A quantitative, non-experimental descriptive-correlation design was used in this study by utilising a formulated questionnaire. The researcher followed the research steps from the beginning of the study when a question is asked to the end when the question is answered (Polit & Beck 2012:56). Furthermore, Burns and Grove (2009:23) describe quantitative research as formal, objective and systematic method using numerical data to obtain information on reality of the world. The quantitative paradigm describes the variables and examines the relationship among

variables. Data were gathered systematically and analysed using statistics to quantify the knowledge and care the people have before conception (Polit & Beck 2010:16).

The quantitative paradigm describes the variables and examines the relationship among variables. Appropriate instruments will be designed to collect the data and measure the human behaviour in relation to appropriate behaviours that would assist to have a healthy outcome of the pregnancy. A representative sample was selected from a cross section of the population that has relevant factors, variables and events that matches the proportions in the overall population (Denscombe 2010:24). In quantitative paradigm, surveys can be used to gather data, through self-reporting about an identified and specific population and the data can be collected through postal telephone or online questionnaires (Moule & Goodman 2009:179). The study measured the knowledge and care that have been provided to the subjects before conception. The subjects were women and men of the childbearing age intending to get pregnant.

A designed questionnaire was used to collect data from men and women of childbearing age that are between 18 to 35 years old that have at least one child and intend to conceive within five years living in Blantyre Urban District. However, the women should not have been done hysterectomy or bilateral tubal ligation while the men should not have under gone vasectomy.

4.3.1 Descriptive study design

The researcher utilised a quantitative exploratory cross sectional descriptive research design to generate information that the subjects have before conception. The research study investigated the information on PCC as it was provided and did not need to manipulate the independent variables (Polit & Beck 2012:223). Furthermore, Burns and Grove (2009:232) describe descriptive study design as designs that gain more information about characteristics within a particular field of study. Therefore, the descriptive design examined the PCC that was provided and then identified problems with current practice, justifying current practice and making judgements. Polit and Beck (2012:226) explain that descriptive research aims to observe, describe and document aspects of a situation as it naturally occurs and describe relationships among variables. Variables are identified to determine an overall picture of the phenomena being examined.

A sample size was selected to represent the population under study and valid and reliable instruments were used. Burns and Grove (2009:240) state that the purpose of descriptive correlational design examines the relationships that exist in a situation as many interrelationships had been identified in a short time. The care that is provided had been analysed and identify the gaps to formulate interventions that would assist to reduce maternal and newborn care.

4.4 RESEARCH METHOD

The research study used a quantitative exploratory cross sectional descriptive research method to generate information that the subjects know about PCC. Information was obtained from the study and the researcher identified variables, developed conceptual and operation definitions and collected relevant data (Polit & Beck 2012:53). Quantitative research method was employed to measure PCC that is provided in Malawian health care settings and identify the gaps that exist to improve the care before pregnancy in order to yield healthy outcomes of the mother and the baby (Bryman 2012:164). Furthermore, the quantitative methods measured the concept of PCC as it is provided in Blantyre Urban District in the three clinics that are mostly used by men and women of childbearing age. Bryman (2012:176) postulates that the findings will be generalised beyond the confines of the particular context in which the research was conducted as the respondents in the study recruited from the representative sample. The study was conducted at the three health centres in Blantyre. One in two women in Blantyre is of childbearing age between 15-35 years old, and the total fertility rate which is an average number child per couple is four (Maoulidi 2013:1). This showed that there are men and women of childbearing age with a lower fertility rate according to the whole country, which is six per couple. This showed that Blantyre District could be used to conduct a quantitative descriptive cross-sectional study as it has high number of people in their childbearing age and could assist to provide information on PCC. Samples were drawn from Ndirande, Mpemba and Limbe health centres which were the three clinics having a higher clientele than other clinics in Blantyre (Maoulidi 2013:5). Ndirande served 28% of the people in Blantyre City, Zingwangwa 18% and Limbe 15 % totalling to 61%. The three clinics provided a population for the study. The three sites were accessible to the researcher and affordable to get data.

A questionnaire was adapted from a study conducted in Texas (Delissaint 2008:90). Data were collected using a developed questionnaire and results were analysed using SPSS. The research used quantitative approach to investigate what is available on the ground on the care that is provided before conception to have a healthy outcome of the mother and the baby. The areas of focus were the psychological preparation for patients to be pregnant, reproductive health care and the physical care that is provided to ensure a healthy pregnancy outcome. In order to generate information, a survey had to be conducted on the selected sample that provided information and later the findings would be generalised to the study population. The relevant strategies developed would assist policy makers to improve on provision of care that would assist individuals to have improved outcomes of pregnancy.

4.4.1 Sampling

A sample was drawn from the study site to provide information that the researcher used to develop interventions or strategies Malawians would use to improve on provision of PCC. Burns and Grove (2009:341) buttress that sampling involves selecting a group of people, events, behaviours and elements with which to conduct a study. A sample was drawn from the entire study population by instituting appropriate sampling techniques that would yield information where conclusions would be derived to provide interventions on PCC that are relevant to Malawi setting (Polit & Beck 2010:306). The research using quantitative exploratory cross sectional descriptive research design needed a desirable sample that can be used to achieve statistical conclusion that could be generalised to the population. A sampling plan was drawn to determine how participants would be selected. Sample units in this study would be men and women of childbearing age between 18 to 35 years that intend to get pregnant. The accessible population in this study were men and women from the three government health centres that provided family planning services, under-five clinics and treatment of minor ailments. These clinics were Ndirande, Mpemba and Limbe in Blantyre District. These clinics provided about 61% of the health care services to men and women of childbearing age. Kothari (2004:55) concludes that an optimum size of the sample is one which fulfils requirements of efficiency, representativeness, reliability, and flexibility. To determine an appropriate sample size, a formula was used to have the sample that is large enough to meet the requirements of the statistical tests (Creswell & Plano Clark 2011:175). The sections below describe the

study setting, study population, sample, sample design, sample selection procedure, selection of the sample size, and illegibility criteria of the subjects.

4.4.1.1 Study settings

The accessible population in this study was from the three government health centres that provided family planning services, under five clinics, and treatment of minor ailments. Burns and Grove (2009:342) define an accessible population as a portion of the target population to which the researcher has reasonable access and a sample is obtained to provide information that can be analysed and be generalised to the whole target population. The men and women of childbearing age attending the three clinics were convenient to the researcher to provide information on the care received on PCC. The men and women of childbearing age that were between 18 to 35 years and intending to conceive within five years who were able to speak Chichewa or English attending the three clinics were convenient to the researcher to provide information on the care received on PCC.Probability sampling method was used as men and women that are attending the clinics and meet the criteria were selected to participate in the study (Polit & Beck 2012:281). Stratified sampling designs subdivided the population into homogeneous subsets. In the study the subdivision were men and women between 18 to 35 years of childbearing intending to get pregnant in the five years to come.

4.4.1.2 Study population

A population is the entire aggregation of cases in which a researcher is interested. For instance, in this study, the population comprised men and women of childbearing age intending to get pregnant (Polit & Beck 2010:306; Burns & Grove 2009:342; Bryman 2012:187). A sample was selected from the entire population for investigation and it consisted of units that are selected from the sampling frame. Participants that met the eligibility criteria were selected to represent the population of the entire study. In this study, these were men and women of childbearing age between 18 and 35 years old. A representative sample was chosen that had characteristics of the population. Population consists of subpopulations called strata that have specific characteristics needed for the study (Polit & Beck 2010:308). An example of strata in the study were patients attending family planning clinic that are likely to be in childbearing age and intending to get pregnant

in the near future. Using strata in sample selection enhanced the sample representativeness (Polit & Beck 2012:281).

The population comprised men and women of childbearing age that had given birth once and intend to have another pregnancy in five years. The specific age was between 18 to 35 years. These men and women were to be able to speak Chichewa or English and had their health care provided in Malawian health facility. Most of the people about 99.9% speak Chichewa as a national language and only 0.1% speak English as an official language (Malawi Language Stats, NationMaster [s.a.]).

4.4.1.3 Sample

A sample is a subset of population elements that the researcher is able to select for investigation (Polit & Beck 2010:307; Bryman 2012:187). The sample unit in this research were men and women that intended to get pregnant. The target population was men and women that are attending family planning, outpatient and under five clinic that intend to get pregnant in the near future. Participants for the study were chosen using stratified random sampling. In stratified sampling the population is divided into stata which are homogenous subsets based on gender, childbearing age, intending to get pregnant in five years to ensure representativeness in the sample (Polit and Beck 2012: 281). The lists of subjects were drawn from the sampling frame that included elements of the population. Accordingly, the study used probabilistic sampling where subjects were selected from a large number of individuals that were representative of the population or represent segment of the population. Subjects were selected randomly so that each individual had a chance of being selected (Creswell & Plano Clark 2011:174). Findings from the accessible population were to be generalised to the entire study population. As much as possible, the researcher-controlled sampling bias that can bring under-representation and over-representation of some segment of the population in terms of characteristics that are relevant to the research question (Polit & Beck 2010:307). The specific age was between 18 to 35 years. These men and women were those that were able to speak Chichewa or English and had their health care provided in a Malawian setting. The women that had undergone hysterectomy or bilateral tubal ligation and men that had undergone vasectomy were excluded from the study (Delissaint 2008:90).

4.4.1.4 Sampling design

The sample design was probability sampling methods in quantitative research based on representation basis and element selection techniques (Kothari 2004:59). Probability sampling refers to a situation where every member or element of the population has a probability higher than zero of being selected to the sample. Conversely, non-probability sampling does not include every element of the population has an opportunity to be included in the sample (Burns & Grove 2005:346). Most nursing and other disciplines use non-probability sampling (Polit & Beck 2010:309; Burns & Grove 2005:350). In addition, Bryman (2012:1880) posits that in non-probability sampling method, human judgement is mostly used to determine the elements that should be included in the study depending on the research problem. Items to be included in the study are selected deliberately by the researcher. Using probability sampling, all men and women between 18 to 35 years of age had a probability chance higher than zero of being selected for the sample. Burns and Grove (2009:346) assert that in probability sampling the subjects had to meet the inclusion criteria hence increased the chance of validity of the study. Delissaint (2008:94) notes that the childbearing age between 18 to 35 years were more likely to have another pregnancy and would be keener to have PCC than men and women that are over 35 years that could be having reproductive problems like fertility issues, ovarian cysts, fibroids, and unplanned pregnancy.

No clients that were less than 18 years and over 35 years and did not speak Chichewa or English were included in the study. Furthermore, the study did not have subjects that have not given birth and had more than two children. Anyone with reproductive health problems and not expecting to conceive within the next five years were excluded in the study.

Since the population of the client that attend the three clinics is known, it is possible to use systematic sampling method. Systematic sampling involves selecting every K^{th} individual on the list (Burns & Grove 2009:349). A starting point is chosen randomly on a queue as clients report to the clinics. In systematic sampling, each participant had an equal chance of participating in the study; hence sampling bias was minimised (Polit & Beck 2010:315). A sampling interval was calculated which was the standard distance between the selected elements and was calculated by dividing the population (N) by the sample size (n) eg I = N/n (Polit & Beck 2010:315).

In the study, the elements to be included in the study were men and women of childbearing age attending the three clinics. Available subjects that were attending the clinics and met the criteria were entered into the study until the desirable sample size was reached.

4.4.1.5 Sample selection procedure

The three clinics in Blantyre were selected to be the accessible population of men and women of childbearing age between 18 to 35 years. The targeted parts of the clinic were those attended by childbearing age population like family planning clinic, under-five clinic and general outpatient clinic. Information was provided to the clients that attend the clinics to create awareness of the study to be conducted. The information included the purpose of the study, sampling and study procedure. After the clients were aware of the study, they made an informed decision to participate in the study or not. Research assistants were properly trained to assist in the recruitment of the participants. All participants that took part in the study were required to sign a consent form.

4.4.1.6 Selection of the sample size

The subjects were recruited from the three clinics, namely, Ndirande, Limbe and Mpemba. The population of people receiving health care services in these clinics are: 221,227 from Ndirande 114,858 from Limbe and 147,678 from Mpemba (Maoulidi 2013:21). A sample size was calculated using the number of patients that attended the three clinics. The clinics were accessible to the researcher and had enough clientele to get health care services. Kothari (2004:174) argues that technically the sample size should be large enough to give a confidence interval of desired width that can be representative to the population. Other factors to consider when drawing the sample was the nature of the units, size of the population, size of the questionnaire, availability of trained investigators, and the time available to conduct the study. A sample size was a representative of the total population and helped to generalise research findings to the entire population (Polit & Beck 2010:316). Solvin formula was used to help to calculate a sample from a known population (Andale 2012).

$n = N/ (1+ Ne^2)$

n = the sample size

N = the known population

e = the desired margin error or error tolerance which is taken at 95% confidence.

Interval (0.05) the sample is being calculated from the total number of expected pregnancies in the three sites.

The expected pregnancies for Ndirande, Limbe and Mpemba health centres on the catchment population are 5759, 5743 and 4724 totalling to 16,226. As stated above, the study would also draw some comparisons from the rural areas hence we would like a sample of about 20% of the total sample to be drawn from the rural clinic in Mpemba. In this case, the urban population sample target will be 80% of the total 3 clinics populations. (80% of 16,226) while 20% of the remainder will come from the rural clinic.

The calculation is as follows:

N = 12,980

e = 0.05

n = 12980/1 + 12.980 (0.05)2

n = 12,980 / (1+ (12,980 *0.0025)

n = 12,980 / (1+40.565)

n = 12,980 / 41.565

n = 312

n = 312 approximately reduced to 300

4.4.2 Data collection

Data collection plans for quantitative studies ideally yield accurate, valid and meaningful data (Polit & Beck 2012:294). Eligible respondents that have agreed to participate in the study were asked questions using the structured questionnaire. The questionnaire consisted of closed-ended questions and open-ended questions. Some sections gathered major demographic and health characteristics of the sample like age, gender, marital status, race, ethnicity, education, and social economic status (Polit & Beck 2012:293). The questions targeted the variables in the HPM that influence the people to

seek for health screening and practiced health habits before they got pregnant. Client attending various clinics provided information related to what practises were related with the preparation of the pregnancy. According to the conceptual framework by Dean (2014c:4) stipulated the context of the data to be collected like psychological and reproductive health preparation, risk assessments, use of illicit drugs and genetic counselling. The conceptual framework outlined the content of the data to be collected.

4.4.2.1 Data collection approach and method

The study used primary data that was collected from self-reports from respondents answering questions posed by the researcher (Kothari 2004:96). Polit and Beck (2010:340) assert that quantitative researchers collect data that is quantifiable collected through structured data collection where the same information is gathered from participants in a comparable pre-specified way. The respondents in the study were men and women attending various clinics to be assisted on health care services like family planning, under-five, treatment of minor ailments, and other services. The most appropriate method to collect data was through an interview schedule as questions were asked by an interviewer using a questionnaire that had closed-ended questions. Data were collected using questions posed to the respondent. Information needed to be coded for proper analysis and interpretation to have an overview of the care and information the subjects have on PCC.

Trained data collectors who were six in total administered a questionnaire personally to a responded and recorded the answers to the questions on a paper questionnaire using paper and pencil. In addition, Polit and Beck (2012:305) aver that some people like the illiterate or uneducated are unable to fill the questionnaires. More importantly, data collectors were trained to make the questions clear and probe where necessary to get the required information. The data collection instrument was developed and was adapted from a study conducted by Delissaint (2008) which was an exploration of PCC using a naturalistic inquiry. A permission to use the questionnaire to develop a relevant instrument that would yield valid data according to Malawian setting and design of the study was granted. A questionnaire that provided the same data was modified and adapted according to Malawian setting (Delissaint 2008:90).

Annexure (4:217) attached a questionnaire that a study in Texas did to assess knowledge on preconception care and used qualitative methods. Questions that assessed on psychological preparation, risk assessments, reproductive health practices, use of drugs during prepregnancy period were asked randomly while in this quantitative study questions were categorised according to a specific context. Some questions in the quetionnaire assisted this study to generate context that could be quantified. Refer Annexure (1:199). The context of the information that was collected in the Texas study was almost the same to the study done but questions had to suite quantitative study and Malawian context. Refer Annexure (4:217) questions 8, 9, 10 and Annexure (1:199) section B, questions 10, 11, 12 and 13.

4.4.2.2 Development and testing of the data collection instrument

The instrument used to collect data in this study was developed making sure that the wording of the questions were clear, sensitive to patients psychological needs and free from bias (Polit & Beck 2010:345). In order to ensure that the instrument is able to collect the information needed, there was be rigours review by peers and it was pretested on a small sample in a different site. Pre-testing the research instrument ensures clarity of the question and evaluate if the desired information is collected to assist in development of guidelines to PCC in Malawi. The pilot study was conducted at an under-five clinic at Queen Elizabeth Central Hospital where there were men and women of childbearing age that report to the clinic. A sample of 10 participants was recruited to participate in the study. After the pilot study, the instrument was scrutinised and reworded to collect the intended outcomes. A midwifery specialist and a public health nurse assisted to reword the instrument before sending it to the statistician who reviewed and corrected some of the items so that findings should be well-recorded for statistical analysis. Polit and Beck (2010:345) posit the purpose of doing a pilot study that is a trial run to determine whether the instrument is useful in generating desired information. The questionnaire was categorised in different themes and questions were reworded to collect information that would be quantified.

4.4.2.3 Refinement of the research instrument

The data collection tool was adapted from a study conducted in Texas hence it needed rigorous pretesting so that it can be evaluated and refined to be used in Malawan setting

(Polit & Beck 2012:296). Comrec and Unisa ethical committee provided guidance to refine the questionnaire (Annexure 12 and 13:237-240). A sample of 10 participants was chosen from men and women of childbearing age that met the inclusion criteria of the study. The aim to pre-test the data collection tool was to help the researcher identify ambiguous questions that are not clear to participants. The time to administer the questionnaire was to be observed to allow participants not to take too long to answer the questionnaire, plan the budget, and assess the participant burden (Polit & Beck 2012:297). It was also important to note if the instrument was valid to collect the required information that would assist to develop guidelines that would assist to improve on PCC in Malawi. A reproductive health specialist reviewed the questionnaire and assisted to reword the questions to collect the information required. Since the study is using quantitative study design, the questions needed to be coded for proper analysis of the responses. Some of the questions were provided with possible answers for the participants to choose their options. Most of the questions were reworded in clear Chichewa words for participants to understand what was asked. Some questions that were yielding almost the same information were deleted. However, the findings during the pre-test survey were not used for the main study and the pilot study site has been excluded from the study. The participants were not included in the study. However, the research study participants consented to participate in the study and were to benefit form the findings after the study to have interventions that would improve maternal and newborn outcome.

4.4.2.3 Characteristics of data collection instrument

The data collection instrument included structured questions that participants responded to the same questions in the same order. The instrument included closed-ended question that included response alternatives designed by the researcher. Closed-ended questions ensured comparability of responses and facilitated quantification of data that is easily analysed. Alternative replies in closed-ended questions helped one to understand the meaning of the question clearly to provide the right information. Open-ended questions were used to get richer information as respondent had given their views to specific questions.

Structured questionnaires were simple to administer and relatively inexpensive to analyse. The question sequence was properly arranged to make the questions clear. The

instrument started with easy question and progressed to more complex ones. Sequence of questions started from general to more specific information needed.

4.4.2.4 Data collection process

Field data collectors were trained by the researcher to use the structured instrument to collect data. Training of data collectors was conducted on the overview of the study, use of the structured questionnaire used to conduct interviews, ethical conduct and the information that is to be collected to assist with the development of preconception guidelines in Malawi. Field data collectors recruited were carefully selected, trained and briefed on how to collect data. The personality was to be honest, sincere, hardworking and impartial (Kothari 2004:99). A good friendly atmosphere of trust and confidence was created during data collection process. The whole data collection process went on well.

4.4.2.5 Ethical consideration related to data collection

4.5.2.5.1 Informed consent

During data collection, there was a need to adhere to ethical principles to ensure that there is no violation of rights of the subjects. The researcher provided the information about the study that would be conducted that assisted to develop relevant strategies and interventions that would assist to improve maternal and newborn outcome. The participants knew the benefits of the research study that the information that they would give would assist Malawian families to access PCC that would make mothers and their babies healthy soon after giving birth. The researcher ensured that participants are provided with information to relieve the anxieties and fear that could have been there when collecting information that involved people's psyches by providing them with the necessary information (Polit & Beck 2010:121).

Participants 18 years and older are autonomous individuals that could make appropriate decisions that affect their lives. Participants were informed that they could choose to participate in the study, ask questions, refuse to give information, and withdraw from the study at any point without any penalty (Polit & Beck 2010:123). All participants had an informed consent and signed a consent form before the interview.

The researcher respected the participants' beliefs, habits and lifestyle to ensure that their human dignity is maintained at all time during the research process. The questionnaires were handled with privacy and confidentiality. It is important to ensure that all research documents like consent forms and answered questionnaires are kept securely at a lockable file cabinet. Gray (2014:68) highlighted that the researcher has to provide the subjects' privacy and confidentiality to prevent violating ethics in research. No respondent wrote a name on the questionnaire as were made anonymous. All the answered questionnaires were kept properly in a lockable file cabinet and keys were kept safely by the principal investigator to prevent exposure of the information unnecessarily. Materials were handled only by trained staff members when working on the study under supervision. Data collectors were trained to handle the participants with respect, dignity and to maintain a good rapport.

4.4.2.5.2 Risks to the participants

The research study did not involve any risks that would cause discomfort, pain, psychological problems, persecution, stigmatisation, or discrimination. The descriptive research design required subjects to provide information using a structured questionnaire that was pre-tested so that it should be clear for participants to provide information. Questionnaires were anonymous and information was handled by the investigator with privacy and confidentiality. Data collectors were trained to handle respondents with dignity and all the rights of the participants were respected. Participants had to sign an informed consent form and if the client had some discomforts owing to some reasons, then the interview was to be discontinued until the client is stable.

The environment to collect data had to be conducive to all the participants so that there should be no discomforts. The room had good lighting source, ventilated and comfortable for the participant. Since data collectors had to read the question for respondents to provide answers, visual and audio privacy was to be maintained at all times so that participants should provide the information needed as most of the respondents were not very familiar to write on their own. The information from the questionnaire was to be analysed and interpreted to assist the researcher to develop relevant interventions on PCC to assist improve maternal and newborn outcome.

4.4.2.5.3 Respondents records

Health passport books and previous antenatal data records that were kept by participants could be used to verify if there were any interventions that were provided in relation to PCC. Personal information had to be handled with care. All records were personal information and were kept safe without being accessible to unauthorised individuals (John Hopkins University 2010:5). An operation manual when conducting research stipulated that all data collected from participants records need to be kept safe and secure.

Data collectors were trained to get the information using the questionnaire, record and store study data for use in the research study (John Hopkins University 2010:6). The investigator was flexible to allow data collectors to report anything if the data collection process had gone wrong somewhere so that measures had to be put in place to fix the problem. This was done so that the investigator can be able to know in advance if some data had not been included in the analysis owing to the problems that could have been encountered.

4.4.2.5.4 Data collectors

John Hopkins University (2010:2) states that the person who collects information on behalf of a research team is an “ambassador” for the study. Data collectors had to be trained on how to handle human subjects as they participated in research. Furthermore, ethical principles had to be used to guide the investigator to impart the appropriate skills that would make a good impression of the study to the one taking part. Data collectors had to be able to get information from individuals that understood on what the study intends to find out from them and had agreed to participate. In addition, the data collector had to ensure that the information collected and recorded is accurate and protected from loss.

4.4.2.5.5 Respect

Data collectors were trained to provide respect to individual participants, focus on achieving the research goals and the data that were collected for the process of research to move smoothly. The most important thing was that as data collectors were part of the research team to achieve the goals of research that would improve the care that is

provided to the people. Individual participants had to be respected despite their culture, gender, age, social status, religion, and other characteristics that make people different from each other. The individual participant is given an opportunity to ask questions. Data collectors provided correct and factual information to the participants after getting an informed consent. The participants were men and women of childbearing age between 18 to 35 years that would understand the information on the study that would be conducted and would decide whether to participate or not without any penalty.

4.4.2.5.6 Personal privacy

Data collectors' training was done by the researcher to ensure that the appropriate information that the questionnaire had would be collected and that there is proper conduct of data collectors as they interact with respondents. In addition, data collectors were trained to maintain privacy and confidentiality when interacting with the participants to collect the information. All personal records and information provided were handled as confidential and was kept at a secure place in a lockable file cabinet. Sensitive information like health habits like taking alcohol, smoking and sexual habits were asked with caution and respect for participants to be free to provide their personal information. Data collectors had to develop good interpersonal skills that would allow participants to provide their private information.

4.4.3 Data analysis

Descriptive statistics were used to analyse the data like the mean, mode, and standard deviation to describe one variable at a time to display information about the study sample (Polit & Beck 2012:389). In addition, quantitative data was analysed using packaged computer analysis programs such as SPSS version 20 (Burns & Grove 2009:456). The researcher recorded all the information on an excel sheet and entered the appropriate data collected from the study and fed in the packaged computer programs to perform data analysis. A data entry officer was hired to ensure accuracy and efficiency on data collection. Technical skill was also needed. Accordingly, a statistician was consulted to assist with the appropriate programs. However, the researcher who is an expert in the maternal and child health care did the interpretation of the data. Data analysed was displayed using frequency distribution tables, pie charts, histogram and bar graphs.

4.4.4 Internal and external validity of the study

4.4.4.1 External validity

Environment and setting of the subjects had to be consistent for all the subjects to minimise extraneous variables into the study situation. The variables that could affect the validity of the study were scrutinised like age, education, social class, accessibility to resources and social cultural factors. In the study the respondents were defined according to the inclusion criteria. The findings could be generalised to the study population in Blantyre urban clinics as stratified random sampling was utilised. Design strategies used to control extraneous variable were employed like selecting subjects that are homogenous and matching subjects between groups in relation to a particular variable and statistical control. Three language specialists, research ethical committee, the superviser and the statistician verified that the instrument was able to obtain information and care that men and women of childbearing age had on PCC.

4.4.4.2 Internal validity

The researcher was aware to control the extraneous variables that would lead the study to have false-positive or false-negative conclusion (Burns & Grove 2009:228). A stratified random sampling was used to control extraneous variables to achieve validity. The inclusion criteria brought elements of same characteristics to be included in the study. The respondents needed to be men and women of childbearing age between 18 to 35 years old that intend to conceive in five years. According to Polit and Beck (2012:244), it is important to control external events that take place concurrently with the independent variable that can affect the outcomes. The researchers need or methods of measurement between two points of data collection (Polit & Beck 2012:244). Six data collectors were trained to understand the context of the study, sampling methods and data collection. During the process of testing the instrument, the data collectors could be more experienced or less accurate or sometimes the participants become bored to be asked the same questions and could answer haphazardly. Data collectors and respondents could have the potential to bring bias to the results. There was training of data collectors to be familiar with the instrument to collect valid data. The questionnaire had questions that were precise and clear to the subjects as testing was done before being administered

to the respondents. Language experts reviewed the questionnaire and it was easy to follow and questions were clear.

4.4.4.3 Construct validity

The questionnaire was formulated based on the concepts in the theoretical framework so that instruments should measure the intended concept and not something else. The HPM concepts were related to develop the instrument that would measure if there were practises in PCC that improve the health outcome of the mothers and their babies.

4.4.5 Reliability

Reliability is the consistency with which an instrument measures the attribute in assessing quality of the data in quantitative research (Polit & Beck 2012:373). Same instruments administered to the same individuals at two different places are able to yield same responses if the tool is reliable. The instruments were tested for reliability before being used in the research study. The aspects that reliability of the instrument can measure in quantitative research include stability, internal consistency and equivalence.

4.4.5.1 Stability

According to Burns and Grove (2009:377), stability is when there is consistency of repeated measures of the same attribute with the use of the same scale which is referred to as test-retest reliability. The factor to be measured remains the same at the two testing times and that any change in the value or score is a consequence of random error. Test-retest reliability was done before conducting the study to ensure reliability of the instruments. A pilot study was conducted to test the instruments for reliability. Polit and Beck (2012:331) aver that instrument reliability is the consistency with which it measures the target attribute in the research study. In order to determine the reliability of the instruments, the correlation coefficient should be calculated to determine the relationship between variable. The researcher should be aware that some variables could change if an instrument is administered twice on the same subjects.

4.4.5.2 Equivalence

The focus on equivalence is the comparison of two versions of the same instrument collected by two observers measuring the same event. Comparison of two observers is referred to as interrater reliability (Burns & Grove 2009:334). The researchers should have a common interpretation of a construct and reach a consensus to ensure that the instrument is reliable (Polit & Beck 2012:334). All data collectors were tested for interrater reliability. Equivalence of the instrument was realised by comparison of the agreements obtained between raters on the coding form with the number of possible agreements. Training of researchers was conducted to yield data that is equivalent and the researcher supervised the data collectors to ensure data collected is equivalent. Polit and Beck (2012:333) point out that the findings from two different data collectors need to be compared to get the interrater reliability that is 0.0 to +1. Cronbach's alpha was used to assess the internal consistency of the structured instrument. Anomalies identified during pilot study were corrected to increase reliability of the instrument.

4.4.5.3 Internal consistency

The instrument was internally consistent or homogeneous to the extent that its items measured the same traits. Internal consistency is valued using coefficient alpha, which is an index of internal consistency to estimate the extent to which different subparts of an instrument are reliably measuring the critical attribute (Polit & Beck 2012:334).

4.5 CONCLUSION

The study utilised the quantitative research method to explore the practices that people of the childbearing age do before conception to have a healthy outcome of the pregnancy. Information was collected from men and women of childbearing age that were between 18 to 35 years old attending Ndirande, Limbe and Zingwangwa clinics. A cross sectional exploratory descriptive design was used in this quantitative research. A structured data collection instrument was used to collect data and information was related to the HPM's concepts. The study used probability-sampling method that allowed each participant to be included in the survey to generate information that will be used to develop appropriate guidelines to provide PCC in Malawi. The data collected were analysed using descriptive statistics using SPSS version 20.0. Findings were presented in the form of charts,

frequency distribution tables and graphs developed through Microsoft Excel program. Findings were summarised and analysed using contingency tables or cross tabulations. Ethical conduct was adhered to by ensuring professional, legal and social obligations. Ethical principles guided the researcher to maintain appropriate ethical conduct throughout the study by ensuring human dignity maintained at all times.

CHAPTER 5

DISCUSSION OF RESULTS ON THE INFORMATION ON PRECONCEPTION CARE ON CHILDBEARING AGE GROUP

5.1 INTRODUCTION

Chapters 1, 2, 3 and 4 provided the background and significance of conducting the study in Blantyre Urban to determine the information that men and women have on PCC. Some chapters highlighted the literature that is available on how PCC is provided in other countries and its benefits towards the outcome of the mother and the baby after delivery. The conceptual framework on HPM by Pender et al (2011:1) was used to guide the study especially on health care practices that would improve pregnancy outcomes. The questionnaire captured information that was relevant to the need of psychogical preparation, reproductive needs, risk assessment and health care practices that would improve pregnancy. If individuals and families have a good conducive psychosocial-cultural environment with adequate information to promote their well-being, they will be committed to action to improve the health outcomes of the mother and the baby after birth. For example, using family planning methods to have a healthy timing and spacing of pregnancy would assist individuals to perceive the benefits of family planning and yield a healthy outcome of the mother and the baby. This chapter will display findings from the data collection conducted using a questionnaire to examine the information and care people of childbearing age have before conception to improve the health of the mother and the baby in Blantyre Urban, Malawi.

5.2 PRESENTATION OF FINDINGS ON INFORMATION AND CARE PROVIDED TO MEN AND WOMEN

5.2.1 Demographic characteristics

A sample was drawn from the three urban clinics that men and women attend as their primary health care on minor ailments and health promotion services. The total number of clients was 300 and the highest number of clients was from Ndirande Clinic that had provided 150 (50%) clients that provide the highest number in Blantyre District, seconded

by Limbe had 100 (33.3%) and a semi-urban clinic Mpemba had 50 (16.6%). The sample was selected to provide the information on the care and information that the women and men have on PCC. The age group that provided more information were between 20-30 years, which was 177 (59%). This age group has had pregnancies and some experience on PCC. The age group was between 31–35 was 99 (33%) and 18-19 were 24 (8%) (see Table 5.1).

Despite many men not accustomed to coming to the clinics to get health care services, 48 (16%) of the men were sampled to participate in the study and provided views on PCC. It is significant to recognise that both men and women should be aware and take part in PCC to improve birth outcomes. The majority of respondents were females that were 252 (84%).

An overwhelming majority of the respondents in the study were married (n=255) (85%) while 21 (7%) were divorced, 18 (6%) were single and 6 (2%) were widowed. PCC guidelines incorporate all people, especially men and women of childbearing age to participate in PCC regardless of their marital status to improve the birth outcomes.

The study was conducted in the southern part of Malawi where the majority are the Lomwes which contributed to n=115 (38.3%). Since the clinics were in the urban area of Blantyre, it included other tribes that have come from other parts of Malawi. Ngonis were 57 (19%), Yawo were n=45 (15%), Chewas were n=36 (1%), Tumbuka's n=19 (6.3%), Mang'anja's were n=18 (6%) and Senas were n=10 (3.3%). Different tribes have practices that affect childbirth positively and negatively and also have some impact on knowledge on PCC and information (see Table 5.1 for a summary of demographic data).

Table 5.1: Demographic characteristics of respondents

Demographic characteristic	**n**	**%**
Age in years		
18-19	24	8
20-30	177	59
31-35	99	33
Sex		
Male	48	16
Female	252	84
Marital status		

Demographic characteristic	n	%
Married	255	85
Single	18	6
Divorced	21	7
Widow	6	2
Tribe		
Chewa	36	1
Tumbuka	19	6.3
Ngoni	57	19
Lomwe	115	38.3
Yawo	45	15
Sena	10	3.3
Mang'anja	18	6.0
Highest level of education		
Tertiary education	28	9.3
Secondary School	137	45.6
Primary school	132	44
None	3	1
Religion		
Roman Catholic	40	13.3
Presbyterian	55	18.3
Seventh Day Adv	40	13.3
Pentecostal	96	32
Church of Christ	23	7.6
Muslim	20	6.6
Jehovah Witness	8	2.6
Anglican	7	2.3
Other	11	3.6
Occupation		
Subsistence farmer	19	6.3
Business person	60	20
Unemployed	124	41.3
Employed	97	32.3

5.2.1.1 Gender in preconception care

The total number of men and women that were recruited for the study were 300 from the three clinics in Blantyre Urban District. Unsurprisingly, the female in total were n=252 (84%) while the men were n=48 (16%). It was vital to have the findings from both men and women as reproductive health issues affect both men and women. Usually, the men in the clinics are fewer than the women as most of the time health issues are affiliated to females. Gender variable will be cross-tabulated with the total knowledge on PCC. This was done to determine if there are any relationships concerning gender and total knowledge on PCC.

Table 5.2 Relationship of sex and marital status in relation to preconception care knowledge

Marital status	Sex	Mean	Median
Married	Male	22.67±7.02	23
	Female	22.59±8.3	21
	Total	**22.60±8.08**	**22**
Single	Male	13.00±00	00
	Female	23.00±9.8	12
	Total	**20.9±7.76**	**22**
Engaged	Male	28.00±25.45	28
	Female	20.2±5.2	18.5
	Total	**20.9±7.8**	**18.5**
Divorced	Female	27.60±9.09	29
Total knowledge	Male	22.69±8.0	-
	Female	22.53±8.2	-
	Total	**22.55**	**-**

Table 5.2 relates the specific socio-demographic relationships between men and women. The men that were married had the knowledge on PCC as the mean was 22.67 above the total mean that was 22.60. Conversely, the knowledge of married females was 22.59, which was not very different from the men and the total mean. In males that were single, their level of knowledge on PCC was below the mean which was 13.00 while for females that were single, their mean was 23.00 above the total that was 28.00. Males that were engaged had their mean 28.00 which is above the mean that was 20.9 while for females it was slightly lower from the mean which was 20.2. Divorced female had the higher mean than the total knowledge which was 27.60 while for divorced males it was 22.69 slightly higher than the mean that was 22.55.

Generally, the level of knowledge on PCC is not very much different from the specific gender. Both men and women's knowledge were almost the same. PCC messages should target both men and women.

5.2.1.2 Age of childbearing men and women

The inclusion criteria stated subjects to be between 18 to 35 years to participate in the study as this category would have had a pregnancy before and had some PCC. The majority of respondents were between 20-30 years who represented n=177 (59%) of the subjects. This age group usually would be having another pregnancy after the first one

and could provide information and care that was provided to them. This indicates that the results provided will be from men and women that have had some experience of having a pregnancy. Ninety-nine (33%) were respondents that were between 31 to 35 years while 18 to 19 years were only n=24 (8%). The study population had men and women of childbearing age.

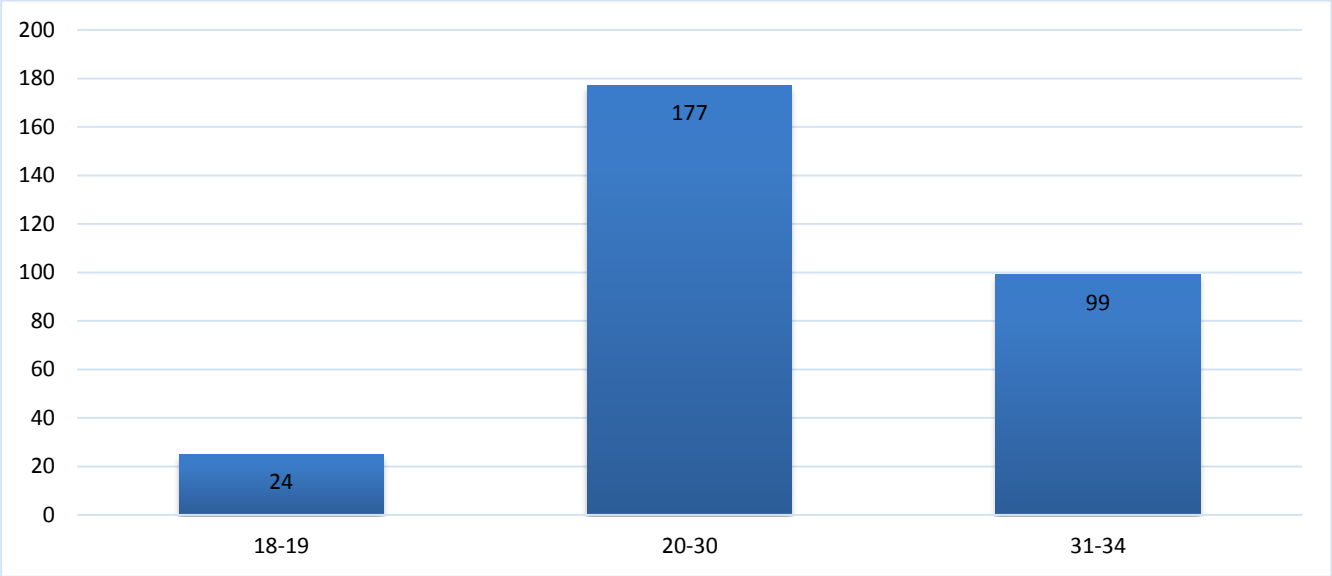


Figure 5.1: Age of respondents

5.2.1.3 Religion in men and women of childbearing age

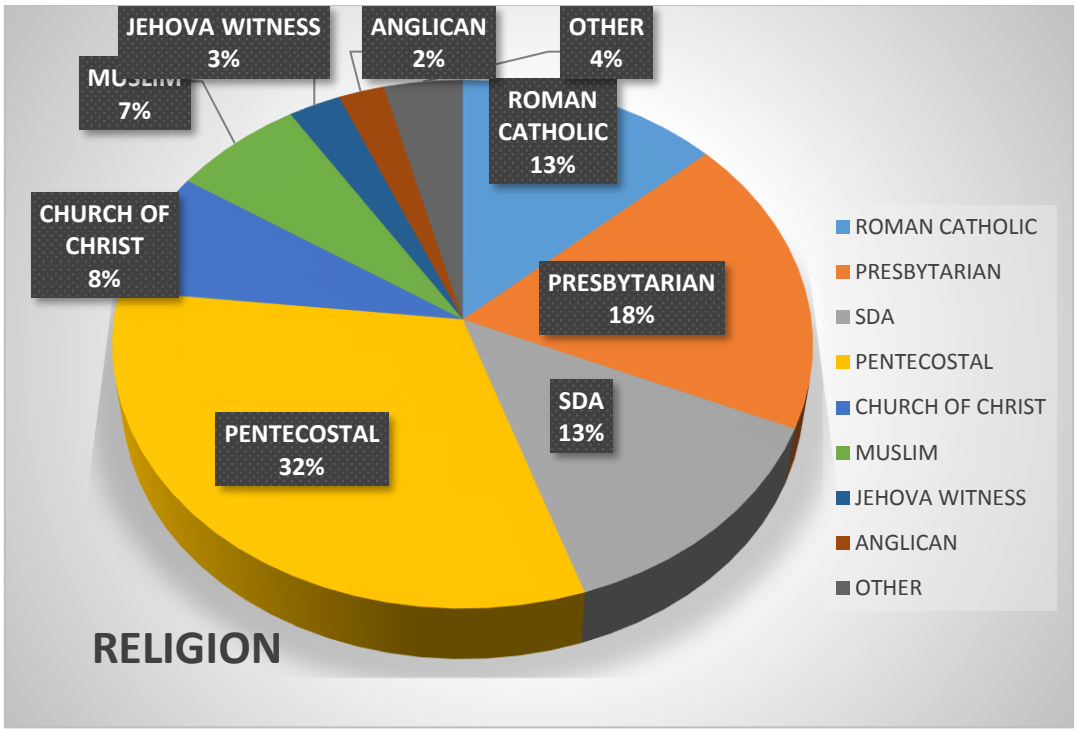


Figure 5.2: Religion of respondents

Religion plays a crucial role in reproductive care practices of people in Malawi. The majority of the subjects were Pentecostals that were n=96 (32%), seconded by Presbyterians n=55 (18.3%), while Roman Catholics were n=40 (13.3%), Seventh Day Adventists n=40 (13.3%), and Church of Christ n=23 (7.6%) Muslim n=20 (6.6%), others n=11 (3.6%) Anglican n=7 (2.3%). Demographic characteristics of the population are shown in Figure 5.1 and religion of respondents is displayed above in Figure 5.2.

5.2.1.4 Education of men and women of childbearing age

The respondents' level of education was between primary and secondary school as the study had n=132 (44%) and n=137 (45.6%) respectively. This variable will play a role on what should be done to ensure that communities in Malawi have adequate health care and information that would assist to improve birth outcomes. Tertiary education contributed to only n=28 (9.3%) and n=3 (1%) had no education (see Figure 5.3 on distribution on level of education).

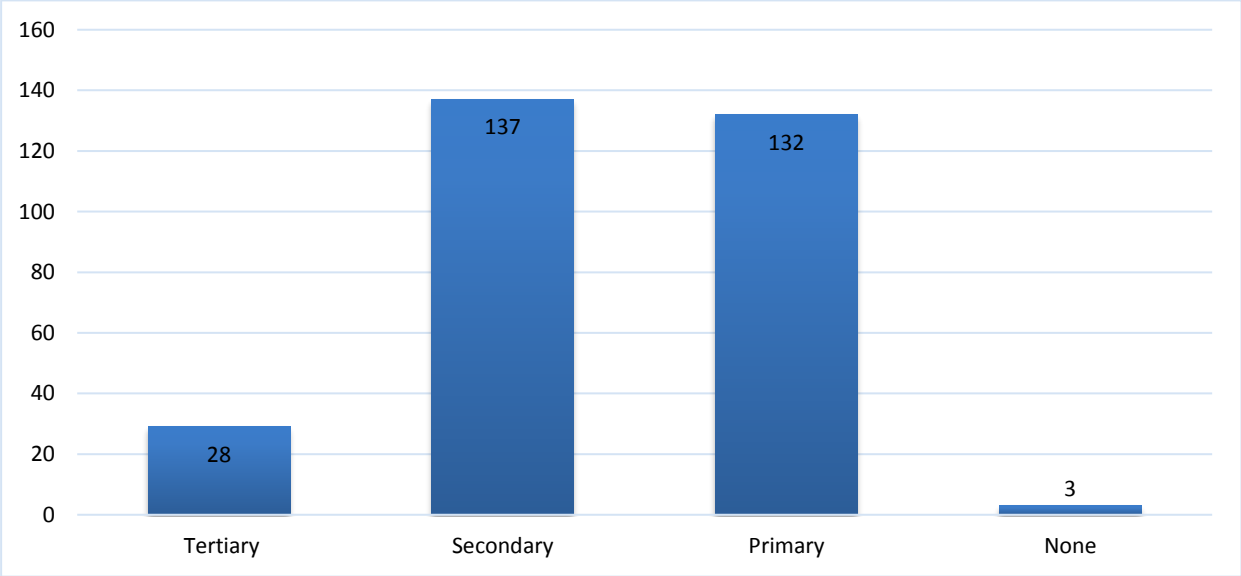


Figure 5.3: Level of education

Table 5.3: Association of demographic data in relation to preconception care knowledge

Item	Statistics (X^2)	Df	P	Md
Age group	3.077	2	.21	22
Sex	1.803	1	.18	22
Marital status	5.233	4	.26	22
Tribe	13.661	7	.05*	22
Religion	24.166	14	.04*	22
Health Centre	22.166	2	<.001*	22
Number of children	0.429	3	.93	22
Number of pregnancies	5.295	4	.26	22
Education	28.75	5	<.001*	22
Occupation	25.741	7	<.001*	22

df=degrees of freedom, X^2=Chi square, p=probability, Md=Median, F=Fishers Exact test, *=significant result

Table 5.3 above indicates association of demographic data in relation to PCC knowledge. Tribe of the respondent is statistically significant at the 5% level of confidence (X^2=13.66, df=7, p=.05). The tribe of a respondent determines the knowledge of the subject in relation to PCC. There is some correlation between the tribe and the knowledge and information on PCC. Religion (X^2=24.17, df=14, p=.04) of the respondent is statically significant to the level of knowledge on PCC. Even the type of health centre that people visited indicates statistical significance at the 5% level (X^2=22.17, df=2, p=<.001). Education was statistically significant by (X^2=28.75, df=5, p =<.001) while occupation of the respondents was statistically significant by (X^2=25.741, df=7, p=<.001). However, there was no statistical significant value with knowledge of PCC with the following variables as shown in Table 5.3: Age group, sex, marital status, number of children, and number of pregnancies.

5.2.2 Psychological preparation before conception

5.2.2.1 Pregnancy planning

Most of the respondents (66.7%, n=200) plan their pregnancy while (33.3%, n=100) specified that their pregnancies are not planned. In addition, n=223 (73.2%) got information which assist in having a healthy pregnancy while n=77 (25.6%) did not get any information on having a healthy pregnancy. Since these were urban population in Blantyre District, they have the opportunity to attend health care services at the clinic. This was also found when n=193 (63.9%) got examined at the hospital before getting

pregnant but only n=61 (20.3%) sought for care when planning to get pregnant before conception. There was an overwhelming response on getting ready to get pregnant as n=270 (89.4%) were ready to care for the pregnancy before conception while n=30 (10%) were not ready to care for their pregnancy. Most of the respondents were psychologically prepared to care of the pregnancy indicated by n=241 (79.8%). However, n=59 (19.5%) were not psychologically prepared to care for their pregnancy. The results are stipulated in Table 5.4 below. Most of respondents had partners that supported them during pregnancy n=276 (91.4) while only n=24 (8%) indicated that had no support. Income is planned for before pregnancy in n=220 (72.8%) respondents while n=80 (26.6%) did not plan for income. n=245 (81.1%) discussed plans on care for pregnancy with partner only n=55 (18.3%) did not discuss any plans.

Table 5.4: Psychological preparation before conception

Preparation before pregnancy	**Yes**	**No**
	n (%)	**n (%)**
Planning to get pregnant	200 (66.2)	100 (33.3)
Given information which assist in having a healthy pregnancy	223 (73.2)	77 (25.6)
Got examined at a hospital before getting pregnant	193 (63.9)	107 (35.6)
Sought for care when planning to get pregnant before conception	61 (20.3)	239 (79.6)
Pregnancy planned	199 (65.9)	101 (33.6)
Ready to care for pregnancy	270 (89.4)	30 (10)
Psychologically prepared to take care of the pregnancy	241 (79.8)	59 (19.6)
Partner prepared to support you during pregnancy	276 (91.4)	24 (8)
Had enough income for support during pregnancy	220 (72.8)	80 (26.6)
Supportive relationship with partner	289 (95.7)	11 (3.6)
Discussed plans on care for the pregnancy with your partner	245 (81.1)	55 (18.3)
Information, tests and care before pregnancy:		
• Eating balanced meal	256 (84.8)	44 (14.6)
• Screening from other chronic diseases	42 (13.9)	258 (86)
• Screening from STIs	145 (48)	155 (51)
• Screening from HIV and AIDS	222 (73.5)	78 (26)
• Checking of Haemoglobin content	58 (19.2)	242(80.6)
• Emotional preparation for pregnancy	102 (33.8)	198 (66)
Role partner played when planning to have pregnancy:		
• Provided emotional support	181 (59.9)	119 (39.6)
• Was resource provider	266 (88.1)	34 (11.3)
• Assisted with house hold chores	195 (64.6)	105 (35)
Preparation for a healthy baby:		
• Medical attention	94 (31.1)	206(68.6)
• Laboratory investigation	225 (74.5)	75 (25)

Preparation before pregnancy	Yes	No
	n (%)	n (%)
• Care for pregnancy	167 (55.3)	133(44.3)
• Delivery place	171 (56.6)	129 (43)
• Transport to the hospital	159 (52.6)	141 (47)
• Birth companion	103 (34.1)	197 (65)
• Resources for birth	229 (75.8)	71 (23.6)

Couples need support of each other before and during pregnancy. The study indicated that n=276 (91.4%) of the respondents had partners that were prepared to support their spouses during pregnancy while n=24 (8%) were not prepared to support their spouses. Most couples had enough income to support them during pregnancy period n=220 (72.8%). This showed that they prepare eventualities that would occur like need of extra resources during pregnancy. However, n=80 (26.6%) specified that they did not prepare enough income. The respondents in the study overwhelmingly showed that they have supportive relationships during pregnancy and n=289 (95.7%) indicated that they have the support while only n=11(3.6%) had no support. In addition, n=256 (84.8%) of the respondents specified that they discuss plans on care of the pregnancy with their partners while n=44 (14.6%) did not discuss any plans to have the pregnancy. More importantly, partners play a role to support their spouses during pregnancy as n=181 (59.9%) were able to provide emotional support. Conversely, n=119 (39.6%) did not get the emotional support. Furthermore, n=266 (88.1%) specified to support their spouses by providing resources necessary to care for pregnancy while n=34(11.3%) did not provide resources to their spouses. Moreover, n=195 (64.6%) assisted their spouses to do house hold chores but n=105 (35%) did not assist their spouses (see Table 5.4 for more information on psychological preparation of pregnancy).

5.2.2.2 Information on preconception care

Figure 5.4 below displays the results on respondents that got some information on PCC. More than 80% of the respondents got the information to improve their diet to having balanced meals to improve pregnancy outcome. Secondly, over 70% of the respondents in the study had HIV screening done before pregnancy which is mostly available to men and women of childbearing age in Malawi. Screening for STIs was done in less than 50% of the respondents. Refer Table 5.3 for details on the other variables that were not done to most of the respondents like checking haemoglobin content, screening from diseases and emotional preparation (see Figure 5.4 and Table 5.7 for specific details).

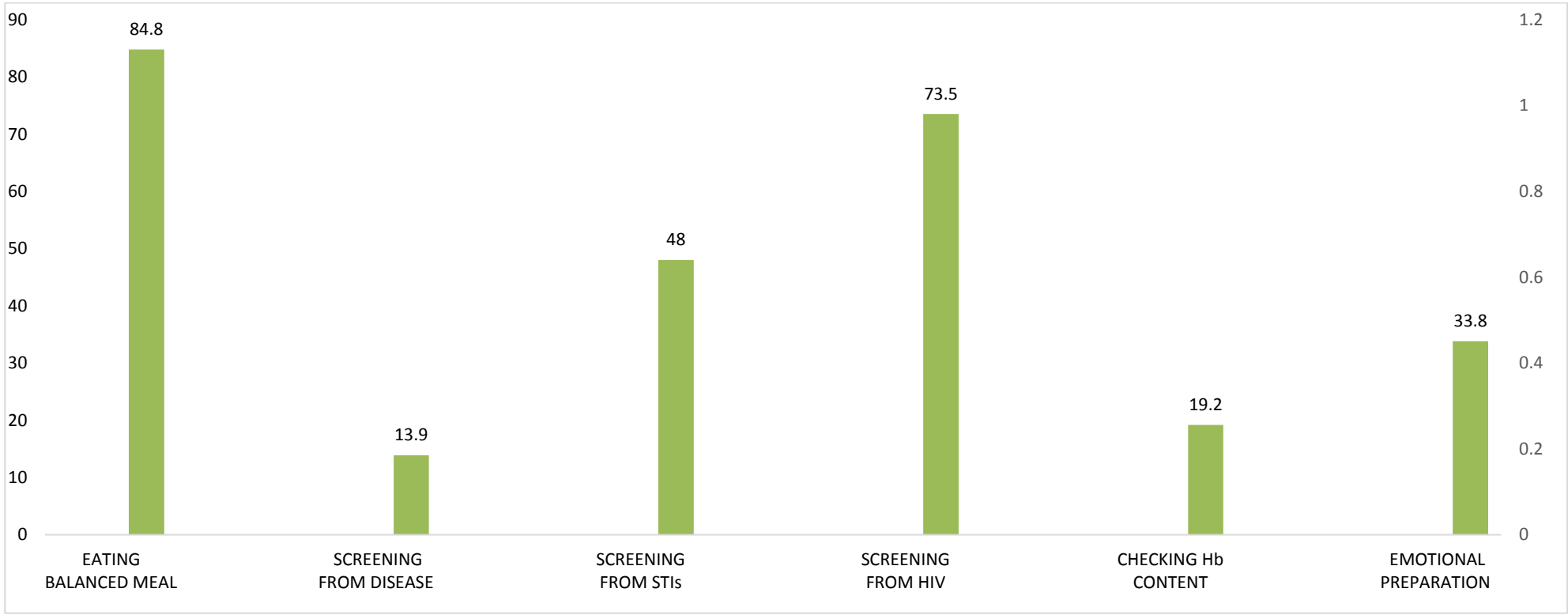


Figure 5.4: Information on preconception care

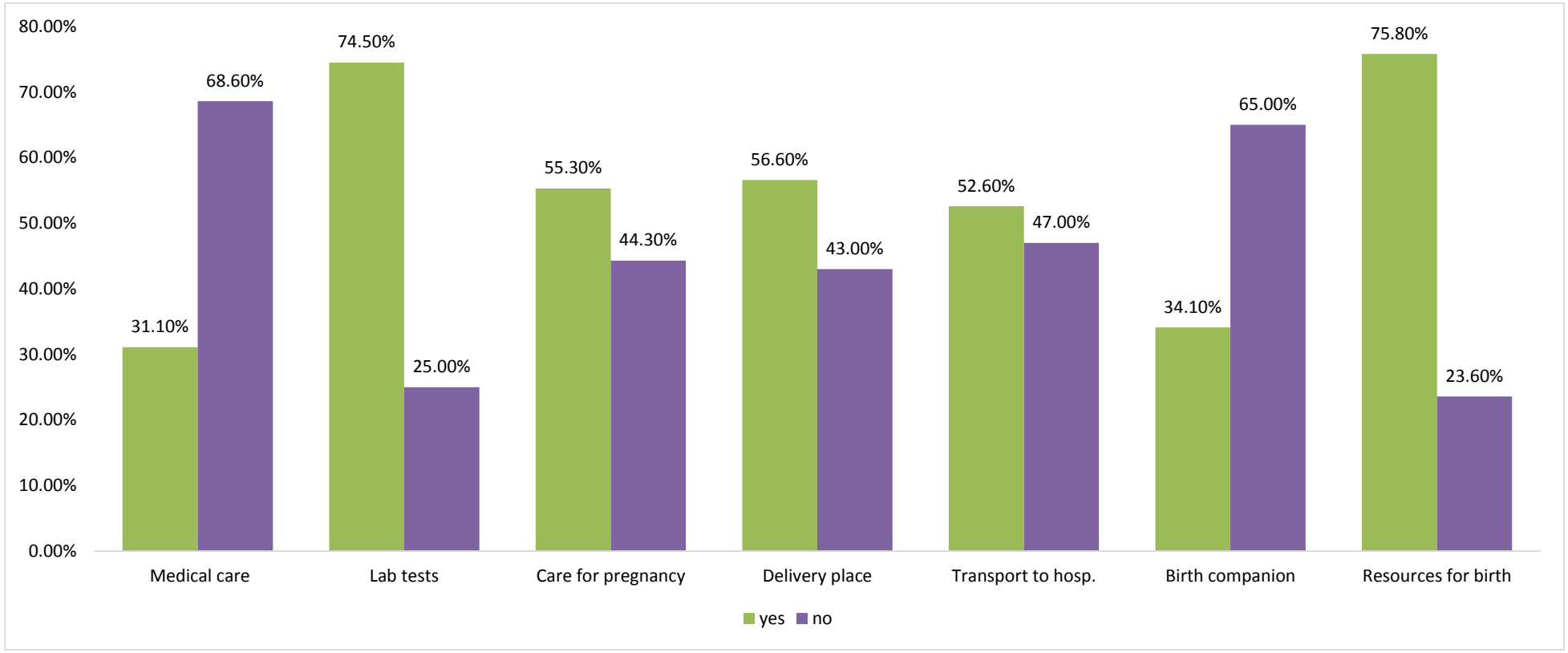


Figure 5.5: Preparations done to have a healthy baby

Clients indicated that information is provided on actions to be done to have a healthy pregnancy. An overwhelming majority of the participants (n=256; 84.8%) showed that they were educated to eat balanced meals to have a healthy pregnancy. However, n=44 (14.9%) did not have the information on eating a balanced diet. Only n=42 (13.9%) were screened from chronic diseases while n=258 (86%) were not screened from any chronic diseases that can affect pregnancy outcome. Despite screening of STIs, there is a routine test for all antenatal mothers n=145 (48%) who indicated that they did not do the VDRL test before pregnancy. Two hundred and twenty-two (73.5%) of the respondents did HIV test.

5.2.2.3 Role of partner when planning for pregnancy

Partners play a crucial role when planning for pregnancy. One hundred and eighty-one (59.9%) of the respondents indicated that their partners provided emotional support when planning to be pregnant. An overwhelming majority of the participants (n=266; 88.1%) reported that their partners were able to provide them with necessary resources to plan to have a healthy pregnancy, see Figure 5.6 below. Finally, n=102 (33.8%) of the respondents planned for assistance of household chores when planning for pregnancy.

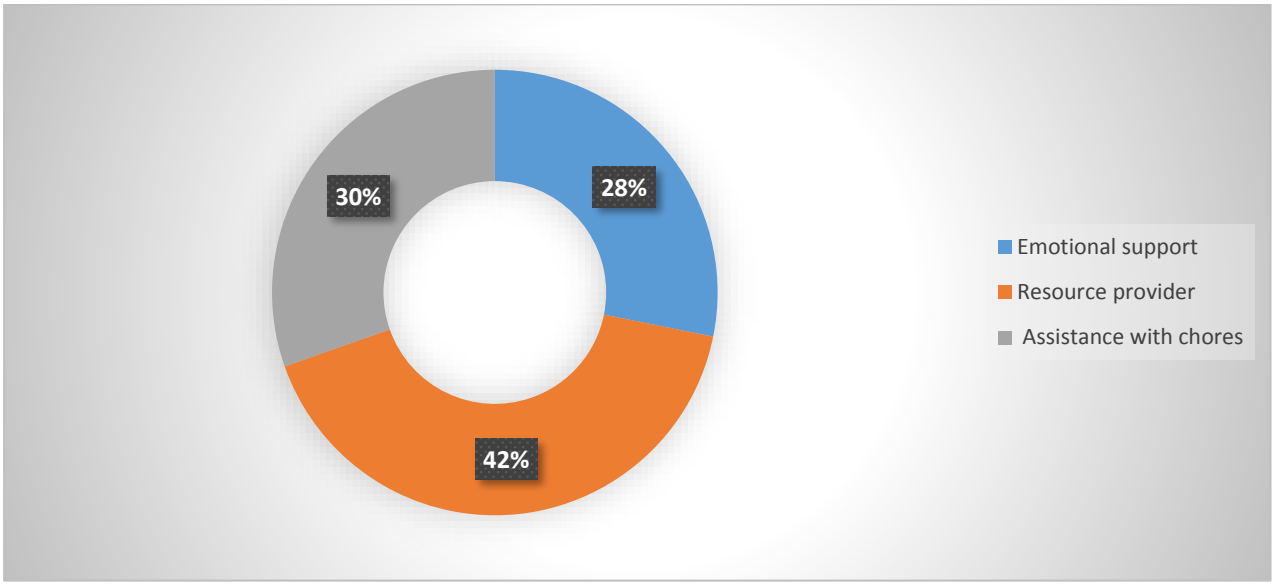


Figure 5.6: Partner role during pregnancy planning

5.2.2.4 Preparation for a healthy baby

Birth preparedness should be done before pregnancy to improve pregnancy outcome. Only n=94 (31.1%) indicated that they seek for medical care before pregnancy while most of the respondents 206 (68.6%) did not see the significance of seeking medical attention before pregnancy (see Table 5.5). At least n=225 (74.5%) recognised the importance of doing laboratory tests before pregnancy while n=75 (25%) did not do laboratory tests. In addition, n=167 (55.3%) indicated that they will plan to provide care for the pregnancy while n=133 (44.3%) did not plan to care for the pregnancy to come. Even before pregnancy n=171 (56.6%) planned for delivery place while n=129 (43%) did not plan where to have the delivery. Planning for transport was done by n=159 (52.6%) of the respondents while n=141 (47.4%) did not plan for any transport. Furthermore, n=103 (34.1) recognised the importance of planning for a birth companion during childbirth while 197 (65%) did not plan for a birth companion. Lastly, n=229 (75.8%) of the respondents prepared for birth resources while n=71 (23%) did not plan for any resources during birth (see Figure 5.5).

5.2.3 Reproductive health data

5.2.3.1 Family planning history

The respondents indicated that n=208 (69.3%) wanted to get pregnant needing more information on PCC while n=92 (30.6%) did not want to get pregnant soon. Most of the respondents indicated that they are sexually active and could get pregnant or contract sexually transmitted diseases. Sixty-seven (22.3%) were not sexually active. Most of the couples despite HIV/AIDS prevalence is very high n=225 (75%) did not use a condom during the sexual encounter. There was a high response on use of family planning methods as n=228 (76%) indicated that they use family planning method which is a good strategy to have PCC. Seventy-two (24%) did not use any family planning due to various reasons. Their partners were mostly willing to have more information on family planning method which was a good indicator that messages on PCC would benefit more people if provided in the clinics (see Table 5.5).

5.2.3.2 Response on benefits of family planning

Response rate on benefits of family planning was generally good in each category (see Figure 5.10). An overwhelming majority of the participants n=245 (81.6%) indicated that the mother need to have good health before pregnancy while n=55 (18.2%) did not know that a woman need to be health before pregnancy. Moreover, n=272 (90.6%) responded that babies grow well if appropriate care is provided, while only n=28 (9.3%) did not know about care of the baby. More importantly, n=144 (48%) indicated that it is important to save enough income before having pregnancy while 156(52%) did not recognise the importance of saving income in preparation to have pregnancy. Furthermore, n=136 (45.3%) of the participants indicated that if children are well spaced responsibilities for the family are reduced while n=164 (54.6%) did not know the impact of reduced responsibility by using family planning methods. Very few of the participants indicated that one of the benefits of family planning is that social services are enough for the country which were only n=130 (43.3%). In contrast, a good number of n=170 (56.6%) could not relate that family planning could have benefit to the country to have enough resources. About n=188 (62%) heard about the messages on PCC while n=112 (37.1%) had not had any messages that promote PCC (see Table 5.5 and Figure 5.7 below.

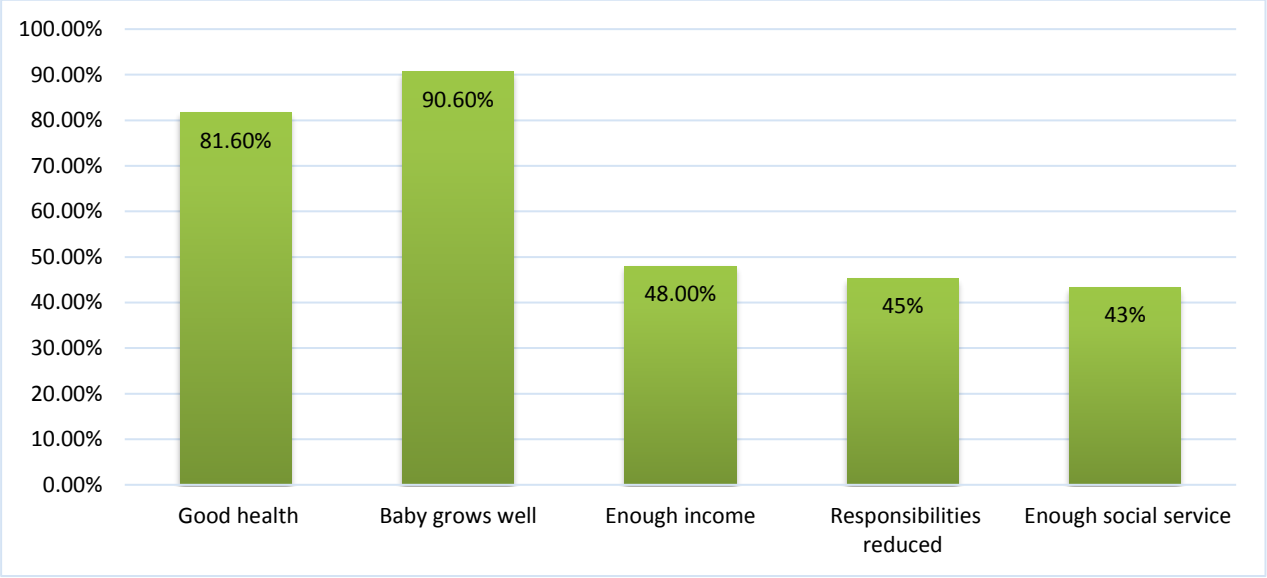


Figure 5.7: Benefits of family planning

5.2.3.3 Use of family planning methods

Use of family planning methods assist couples to plan for their reproductive goals and have a pregnancy when ready. Long-term family planning methods assist clients not to conceive when not ready. One can practice PCC if use of family planning methods is followed correctly. Forty-two (13.9) of the participants indicated that they do not use any of the family planning methods available in the clinics while 260 (86.1%) use family planning methods. A good indication that clients can use family planning before conception. This make them at risk to have pregnancy when not ready. Twenty-one (7.0%) used pills, n=21 (7.0%) used IUCD, while over 50% respondents n=165 (55%) used Depo provera, n=49 (16.3%) used implants, n=7 (2.3%) used tubal ligation and only n=10 (3.3%) used condoms (see Figure 5.8 below on distribution of family planning methods). Use of family planning is not fully utilised to ensure PCC.

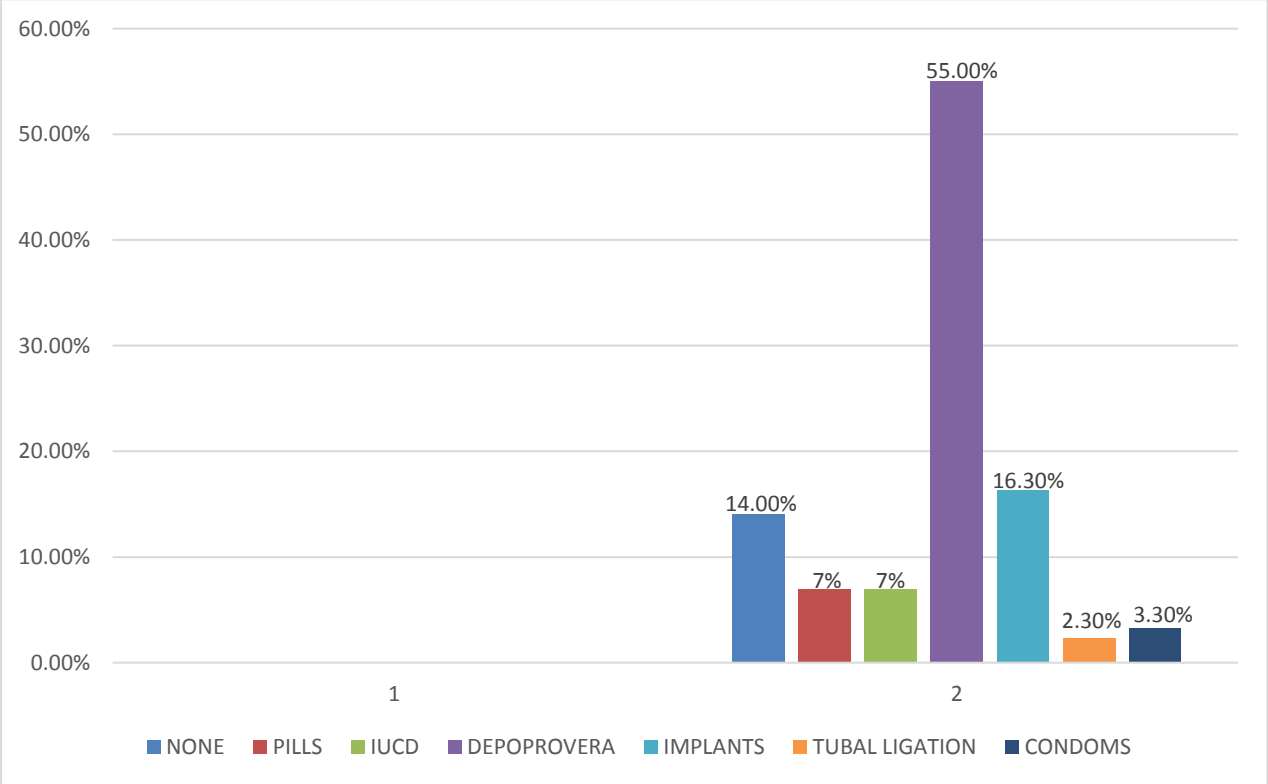


Figure 5.8: Family planning methods

Table 5.5: Reproductive health data 1

Preparation before pregnancy	Yes	No
	n (%)	n (%)
Wanting to get pregnant again	208 (69.3)	92 (30.6)
Had a sex encounter last six months	233 (77.6)	67 (22.3)
Used a condom during last sex encounter	75 (25)	225(75)
Use of a family planning method	228 (76)	72 (24)
Would your partner like more information about planning pregnancy	228 (76)	72 (24)
Benefits of family planning:		
• Mother has good health before pregnancy	245 (81.6)	55 (18.2)
• Baby grows well with enough care	272 (90.6)	28 (9.3)
• Income of the home is saved	144 (48)	156 (52)
• Responsibilities are reduced	136 (45.3)	164 (54.6)
• Social services are enough for the country	130 (43.3)	170 (56.6)
Methods of family planning:		
• None	42 (14)	258 (86)
• Pills	21 (7)	279 (93)
• IUD21(7.0)	21 (7)	279 (93)
• Depo provera	165 (55)	135 (45)
• Implants	49 (16.3)	251 (83.4)
• Tubal ligation	7 (2.3)	293 (97.6)
• Condoms	10 (3.3)	290 (96.6)
Heard messages that provide advice	188 (62.6)	112 (37.3)

Table 5.6: Reproductive health data 2

Pregnancies, number of children and HTSP	n (%)
Planning to get pregnant:	
• 1 to 2 years	99 (33)
• 3 to 4 years	104 (34.6)
• 5 to 6 years	28 (9.3)
• More than 6 years	44 (14.6)
• N/A	25 (8.3)
Times you have ever been pregnant:	
• Currently	28 (9.3)
• 6 months to 1 year	43 (14.3)
• 2 to 3 years	76 (25.3)
• 4 to 5 years	51 (17)
• More than 5 years	49 (16.3)
• N/A	53 (17.6)
Children alive:	
• 1 to 2	196 (65)
• 3 to 4	91 (30)
• 5 to 6	9 (3)

Pregnancies, number of children and HTSP	n (%)
• 7 to 8	4 (1.3)
When to get pregnant:	
• Currently	28 (9.3)
• 6 months to 1 year	43 (14.3)
• 2 to 3 years	76 (25.3)
• 4 to 5 years	51 (17)
• More than 5 years	49 (16.3)
• N/A	53 (17.6)
Healthy timing and spacing of pregnancy:	
• 1 year	12 (4)
• 2 years	60 (20)
• 3 years	68 (22.6)
• 4 years	46 (15.3)
• 5 years	72 (24)
• More than 5 years	26 (8.6)
• Do not know	16 (5.3)
Recommended time after abortion:	
• 6 months	92 (30.6)
• 1 year	61 (20.3)
• 2 years	40 (13.3)
• 3 years	23 (7.6)
• 4 years	6 (2)
• 5 years	12 (4)
• Do not know	66(22)
Recommended time after stillbirth:	
• 6 months	70 (23.3)
• 1 year	77 (25.6)
• 2 years	58 (19.3)
• 3 years	19 (6.3)
• 4 years	5 (1.6)
• 5 years	11 (3.6)
• Do not know	60 (20)

5.2.3.4 Knowledge on healthy timing and spacing of pregnancy

5.2.3.4.1 Number of children and timing to get pregnant

On the timing of pregnancy, n=99 (32.8%) indicated that pregnancies should be spaced between 1 to 2 years, 3 to 4 years were n=104 (34.4%), 5 to 6 years n=28 (9.3%) more than 6 years were n=44 (14.6%) and not applicable n=27 (8.9%). This gives mixed messages indicating that men and women of childbearing age need appropriate information on the spacing of pregnancy.

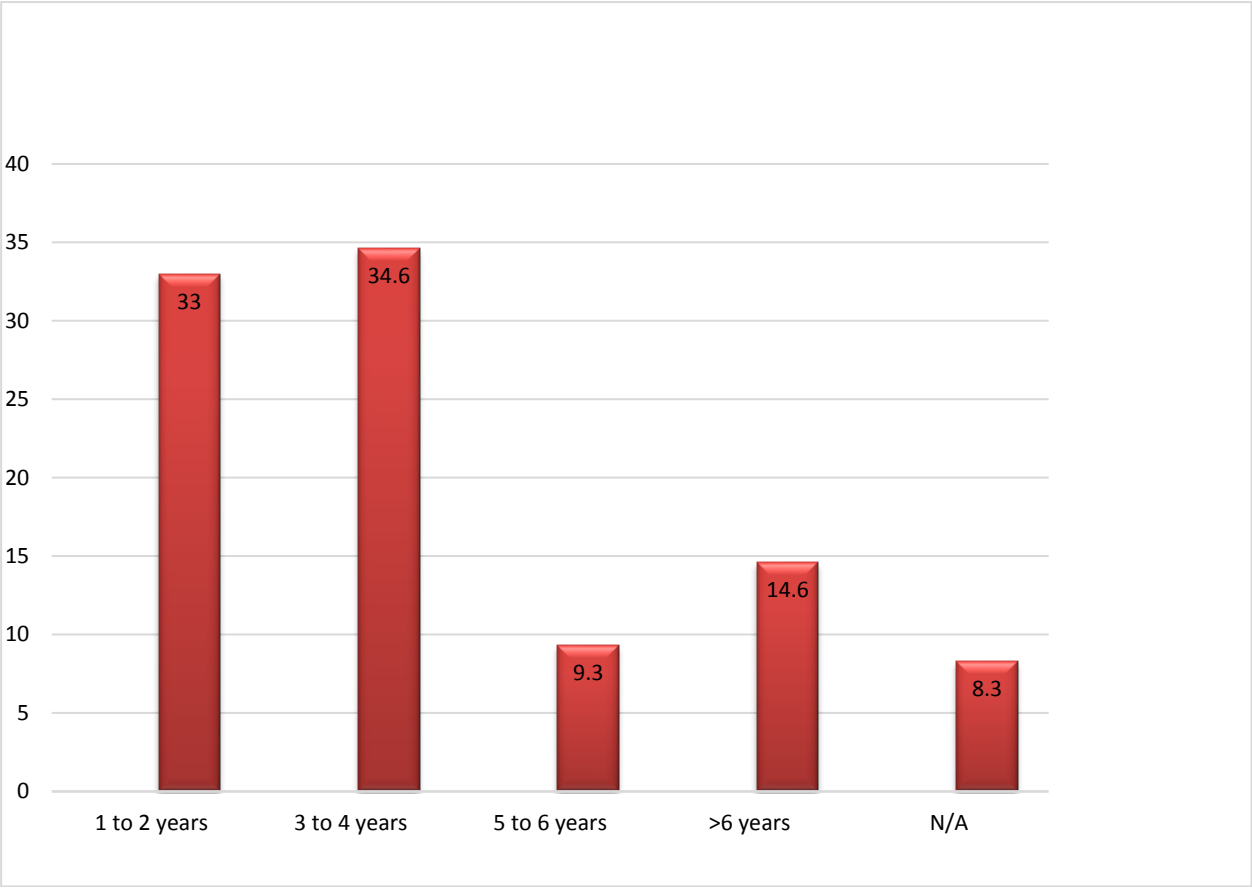


Figure 5.9: Timing of pregnancy

Some respondents (n=28; 9.3%) were currently pregnant, n=43 (14.2%) were pregnant between six months and one year, n=76 (25.2%) were pregnant two to three years ago, n=51 (17.9%) were pregnant four to five years ago and n=49 (16.2%) had pregnancies five years ago. However, n=54 (17.9%) did not know the last time were pregnant (see Table 5.5).

Nearly two-thirds (n=196; 64.9%) of the respondents had one to two children that were alive, three to four children alive were n=91 (30.1%), n=51 (16.9%) had four to five children alive while n=2 (7%) had seven to eight children.

Respondents that wished to get pregnant were 28 (9.3%), 43 (9.3%) were already pregnant, 76 (25.2%) were pregnant 2 to 3 years ago, 51 (16.9%) were pregnant 4 to 5 years ago and 49 (16.2%) were pregnant more than 5 years ago and 54 (17.9%) was not applicable. The majority of respondents were within the childbearing age in need of more information on PCC. About n=196 (64.9%) had 1 to 2 children, seconded by those that had 3 to 4 children at n=91 (30.1%), 5 to 6 children were 9 (3.0%) and those that had 7

to 8 children were only 2 (0.7%). The majority of the respondents needed information on PCC to benefit their families. Refer Table 5.6, Figure 5.10.

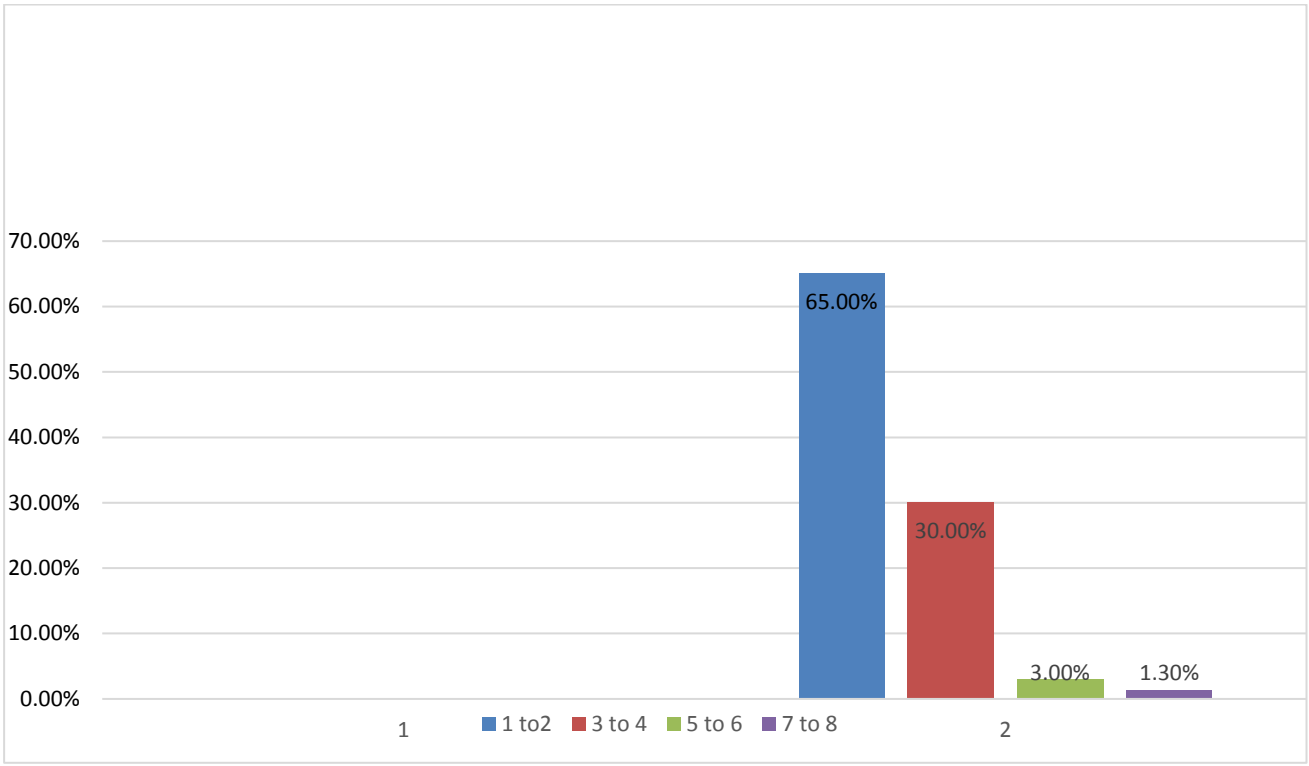


Figure 5.10: Number of children of respondents

5.2.3.4.2 Healthy timing and spacing of pregnancy

On the time to space the pregnancy which is HTSP, n=12 (4.0%) thought the best time to space the pregnancy is 1 year. In contrast, n=60 (20%) thought it could be 2 years. Over two-thirds (n=68; 22.6%) thought it to be four years. Moreover, the majority (n=72; 24%) thought the best timing to have the pregnancy is five years. Those that responded that the best time should be more than 5 years were n=26 (8.6%) and n=16 (5.3%) did not know the best timing for pregnancy (see Table 5.6 and Figure 5.11).

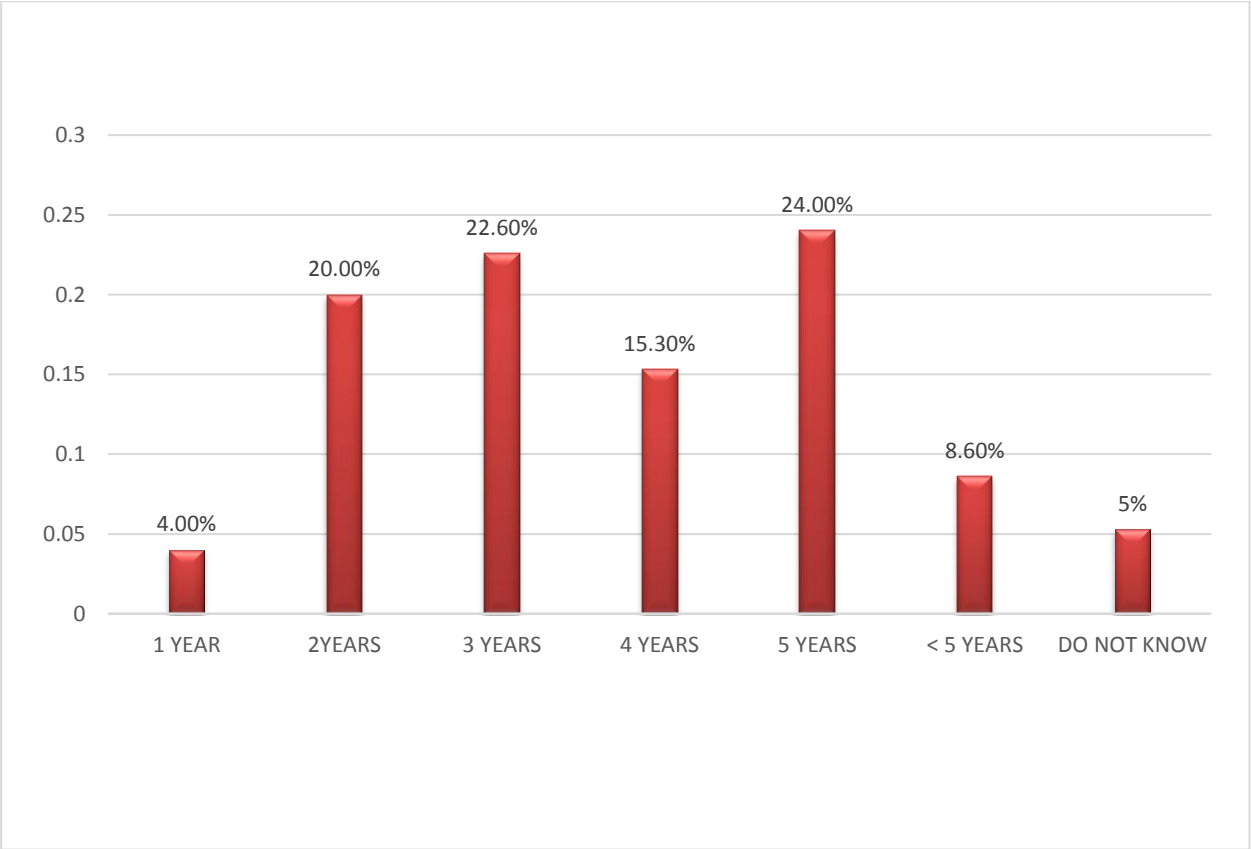


Figure 5.11: Healthy timing and spacing of pregnancy

5.2.3.4.3 Healthy timing and spacing of pregnancy after abortion

Men and women of childbearing age were also asked the best time one should be pregnant after an abortion. About n=92 (30.6%) indicated that one could be pregnant after six months while n=61 (20.3%) indicated that one should be pregnant after one year. In addition, n=40 (13.3%) indicated that after abortion one should be pregnant after two years, while n=23 (7.6%) responded that after abortion one should be pregnant after three years. Furthermore, n=6 (2.0%) thought it to be four years and n=12 (4.0%) indicated that after abortion the health timing of pregnancy should be five years. Lastly, n=66 (22%) did not know the recommended time after abortion (see Table 5.6). It is important to practice PCC after an abortion to prevent recurrence and to screen all factors that contributed for one to have an abortion before the next pregnancy.

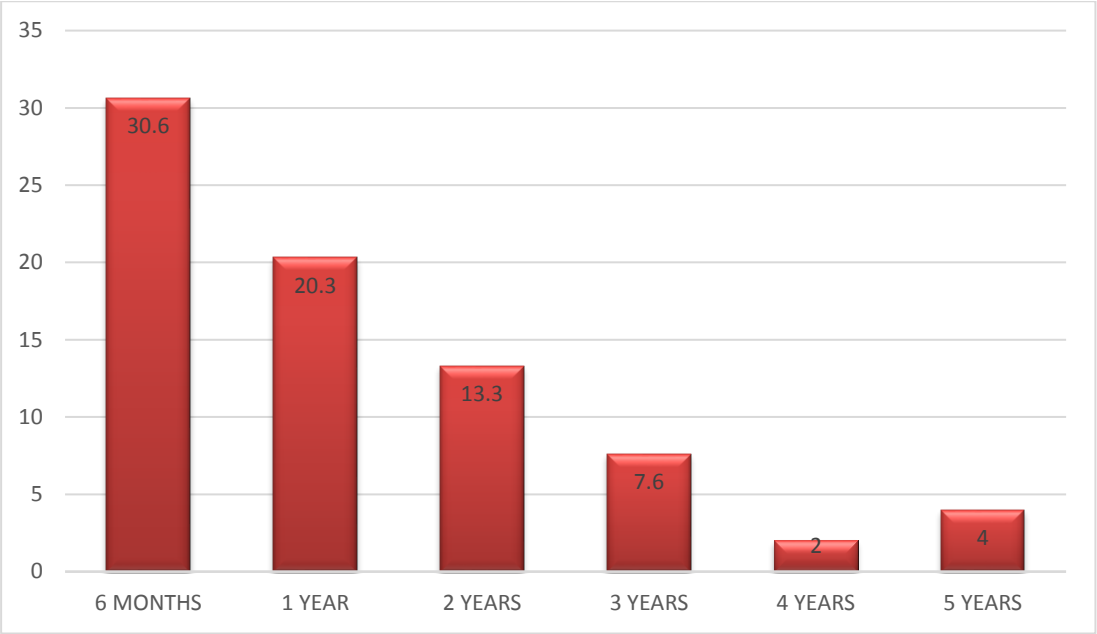


Figure 5.12: Recommended time to conceive after abortion

5.2.3.4.4 Healthy timing and spacing of pregnancy after stillbirth

The majority of respondents (n=77; 25.6%) indicated that after the birth of a stillbirth, a mother should conceive after one year. In contrast, n=70 (23.3%) thought the best time should be after six months of the birth of the stillborn. In addition, n=58 (19.3%) indicated that the best time should be after two years, while n=19 (6.3%) indicated that the mother should conceive after three years. Less than 2% (n=5; 1.6%) indicated the best time to be at four years and n=11 (3.6%) indicated the best time to be at five years. Nevertheless, n=60 (20%) did not know the best time to have a pregnancy after stillbirth.

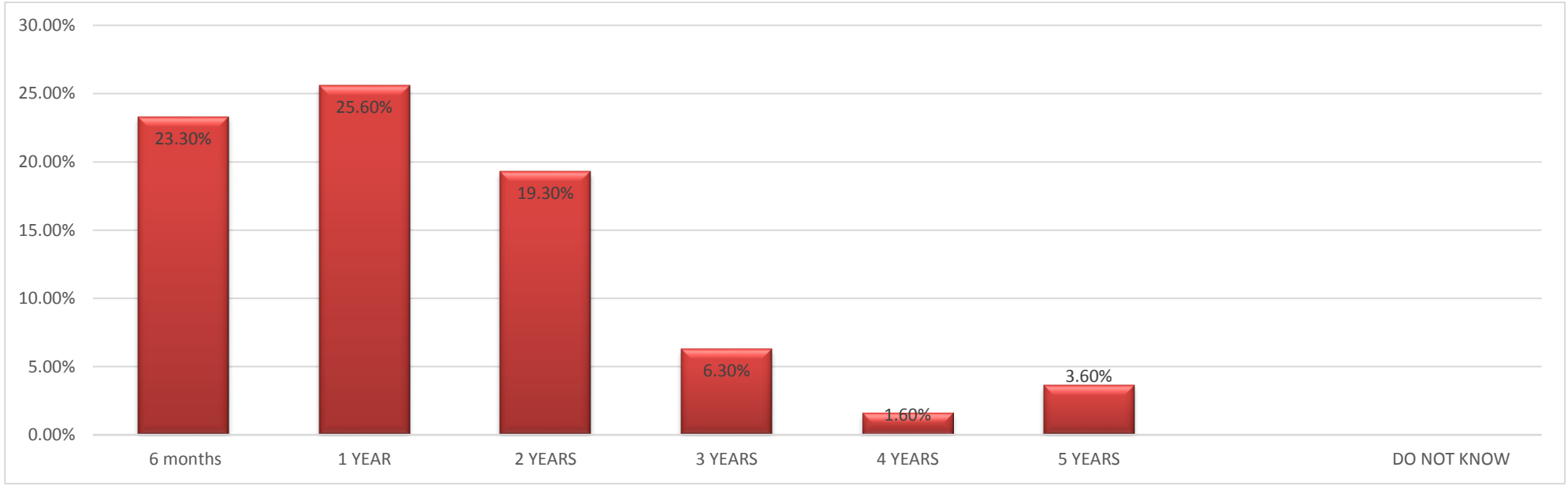


Figure 5.13: Conception after stillbirth

Table 5.7: Risk assessment before conception

Risk assessments done befoe conception	Yes	No
	n (%)	n (%)
Conditions affecting pregnancy:		
• Respiratory problems	96 (32)	204 (68)
• Cardiac disease	33 (11)	267 (89)
• Hypertension	96 (32)	204 (68)
• Anaemia	101 (33.6)	199 (66.3)
• Malnutrition	77 (25.6)	223(74.3)
• Abdominal surgery	15 (5)	285 (95)
• Gynaecological problem	52 (17.3)	248 (82.6)
• Reproductive health	59 (19.6)	241 (80.3)
• Diabetes	30 (10)	270(90)
• Nutritional assessment	130 (43.3)	170 (56.6)
Access of information:		
• Radio	116 (38.6)	184 (61.3)
• Television	44 (14.6)	256 (85.3)
• Antenatal clinic	74 (24.6)	226 (75.3)
• Hospital	125 (41.6)	175 (58.3)
• Church	21 (7)	279 (93)
• N/A	67 (22.3)	233 (77.6)
• Home	27 (9)	273 (91)
Message received:		
• Good health before conception	124 (41.3)	176 (58.6)
• Laboratory tests, HB, STIs, Blood group HIV/AIDS	159 (53)	141 (47)
• Planned pregnancy	131 (43.6)	169 (56.3)
• Healthy timing and spacing of pregnancy	75 (25)	225 (75)
• Preparation for a healthy pregnancy	119 (39.6)	181(60.3)
Medications taken to improve health before contraception:		
• Folic acid	32 (10.6)	268 (89)
• Ferrous sulphate	103 (34.3)	197 (65.6)
• Fansidar	106 (35.3)	194 (64.6)
• Multivitamins	49 (16.3)	251 (83.6)
• Immunisations	136 (45.3)	164 (54.6)
Investigations before getting pregnancy:		
• Full blood count	38 (12.6)	262(87.3)
• Blood group	38 (12.6)	262(87.3)
• Malaria parasites	90 (30)	210 (70)
• VDRL	94 (31.3)	206 (68.6)
• HIV	222 (74)	78 (26)
• Cervical cancer	65 (21.6)	235 (78.3)
Type of vaccines before pregnancy:		
Tetanus Toxoid Vaccine	171 (57)	129 (43)
Cancer of the cervix	6 (2)	294 (98)
Pneumonia vaccine	5 (1.6)	295 (98.3)

5.2.4 Risk assessment before conception

5.2.4.1 Assessments of conditions affecting conception

The number of respondents that were assessed for respiratory problems were n=96 (32%) while n=204 (68%) were not assessed. Only n=33 (11%) were assessed for cardiac diseases while the rest n=267 (89%) were not assessed. About n=96 (32%) were assessed for hypertension while n=204 (68%) were not assessed. In addition, n=101 (33.6%) were assessed for anaemia while n=199 (66.3%) were not assessed. About n=77 (25.6%) were not assessed for malnutrition while n=223 (74.3%) were not assessed. Only n=15 (5.0%) were checked if they have abdominal surgery before conception while n=285 (95%) were not assessed. Thirty (10%) of the respondents were assessed for reproductive health problems before conception while n=270 (90%) were not done. In addition, n=30 (9.9%) were assessed for diabetes. An overwhelming majority (n=270; 90%) were not assessed for diabetes. One hundred and thirty (43.3%) were assessed for nutritional problems while n=170 (56.6%) were not assessed (seeTable 5.7).

5.2.4.2 Investigations done before conception

Most of the respondents (74%, n=222) were HIV tested while (26%, n=78 (were not tested. Furthermore, n=94 (31.3%) of the respondents were VDRL tested while n=206 (68.6%) were not VDRL tested. On malaria parasites, n=90 (30%) of the respondents were tested while n=210 (70%) were not tested). Cervical cancer test was done by n=65 (21.6%) of the respondents while 235 did not do any test. Blood group and full blood count was done by n=38 (12.6%) of the respondents only while n=262(87.3) did not do any test on blood group and full blood count (see Table 5.7 and Figure 5.14).

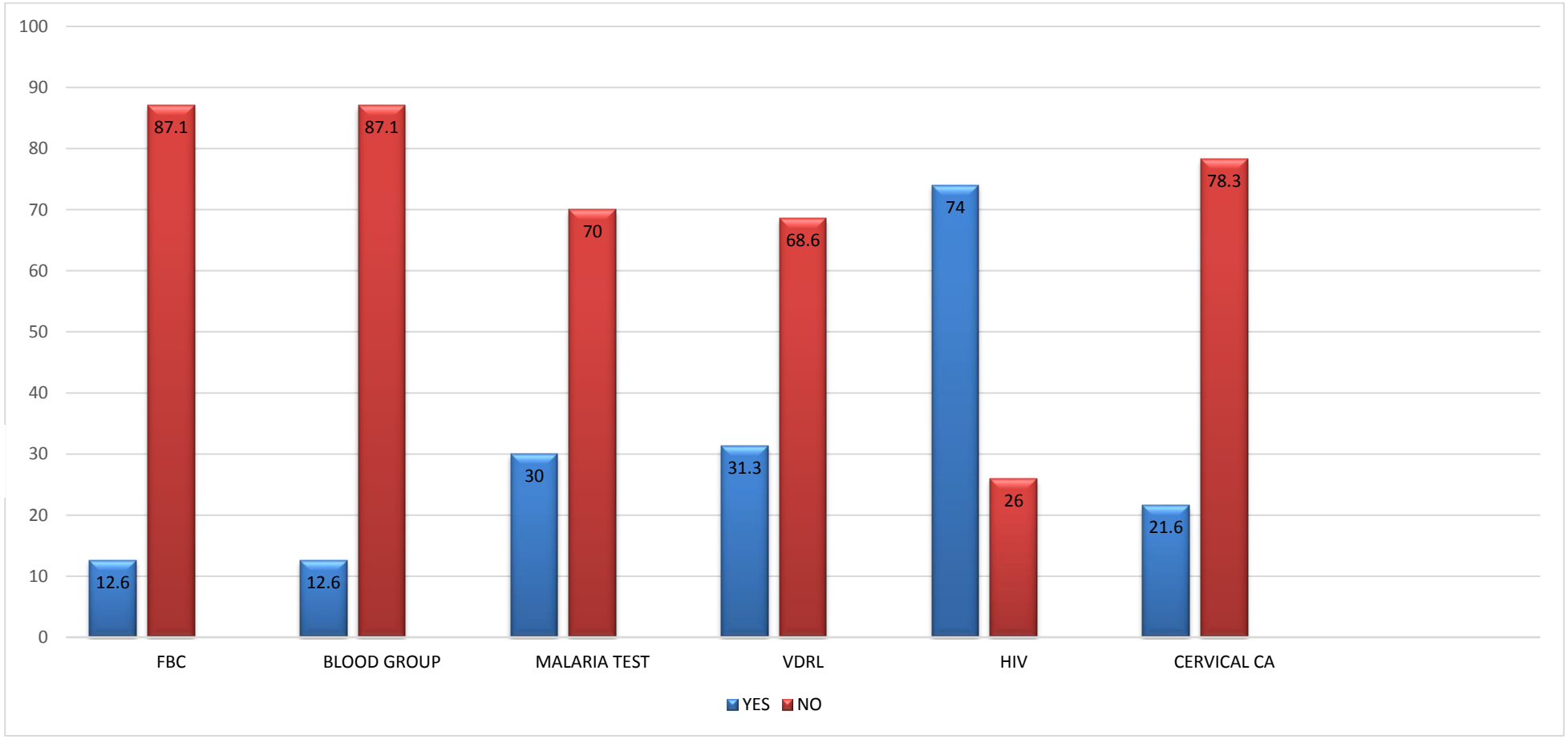


Figure 5.14: Investigations done before pregnancy

5.2.4.3 Medications to prevent complications during pregnancy

Only n=32 (10.6%) of the respondents took folic acid before conception but n=268 (89%) did not have any folic acid before conception. In addition, n=103 (34.3%) of the respondents took ferrous sulphate while n=197 (65.6%) did not take any medication like ferrous sulphate before pregnancy. Furthermore, n=106 (35.3%) had taken Fansidar during pregnancy to prevent malaria while n=194 (64.6%) did not take Fansidar. Only n=49 (16.3%) had multivitamins to improve appetite during pregnancy while n=251 (83.6% did not have any of the multivitamins , see Table 5.7 and Figure 5.15.

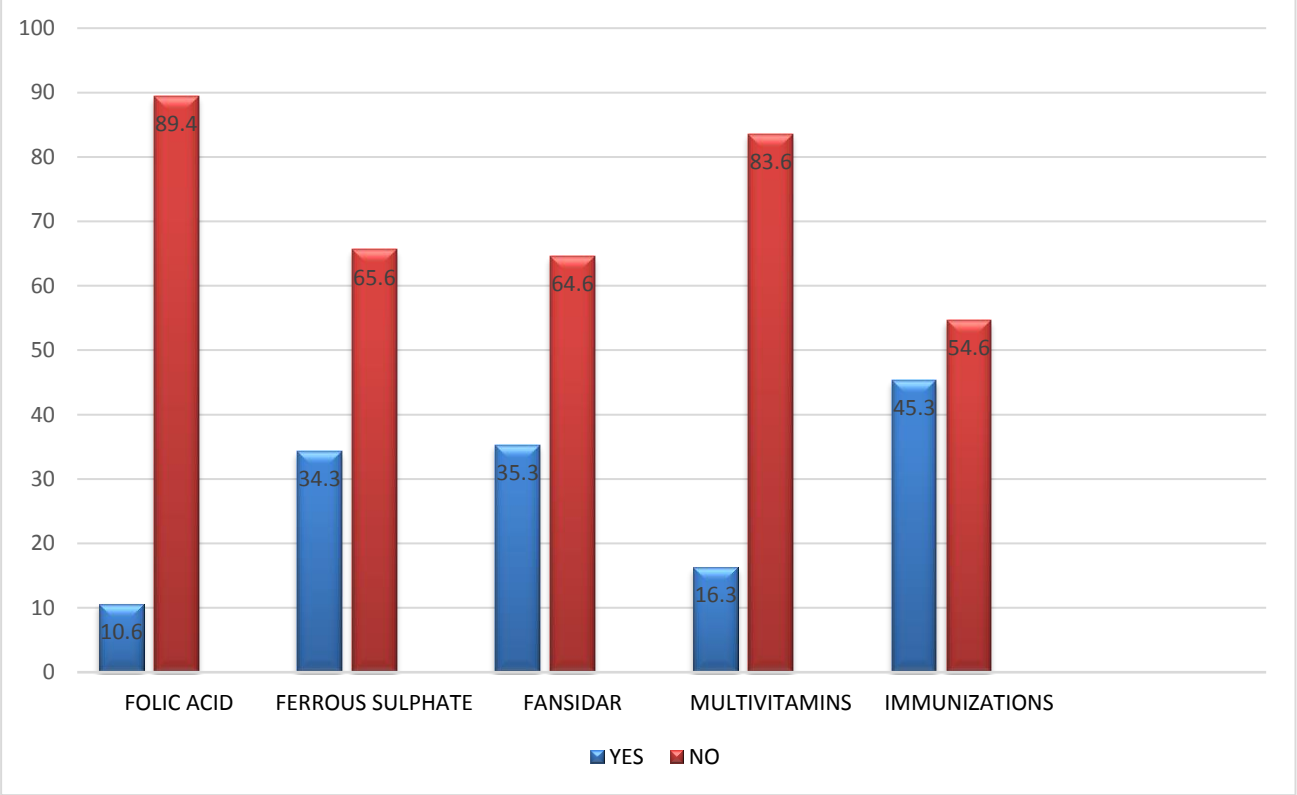


Figure 5.15: Medications taken to improve health before pregnancy

5.2.4.4 Vaccinations done before pregnancy

One hundred and thirty-six (45.3%) agreed to have been done vaccinations before pregnancy while n=164 (54.6%) did not have any immunisations administered to them. Over half (n=171; 57%) had Tetanus Toxoid Vaccine (TTV) administered to them while n=129 (43%) did not have TTV. Only n=6 (2.0) of the respondents had been vaccinated of cancer of the cervix while an overwhelming majority (n=294; 98.0%) were not vaccinated from cancer. Only n=5 (1.6%) of the respondents were vaccinated from

pneumonia but most of the respondents n=295 (98.3%) were not done (see Table 5.7 and Figure 5.16).

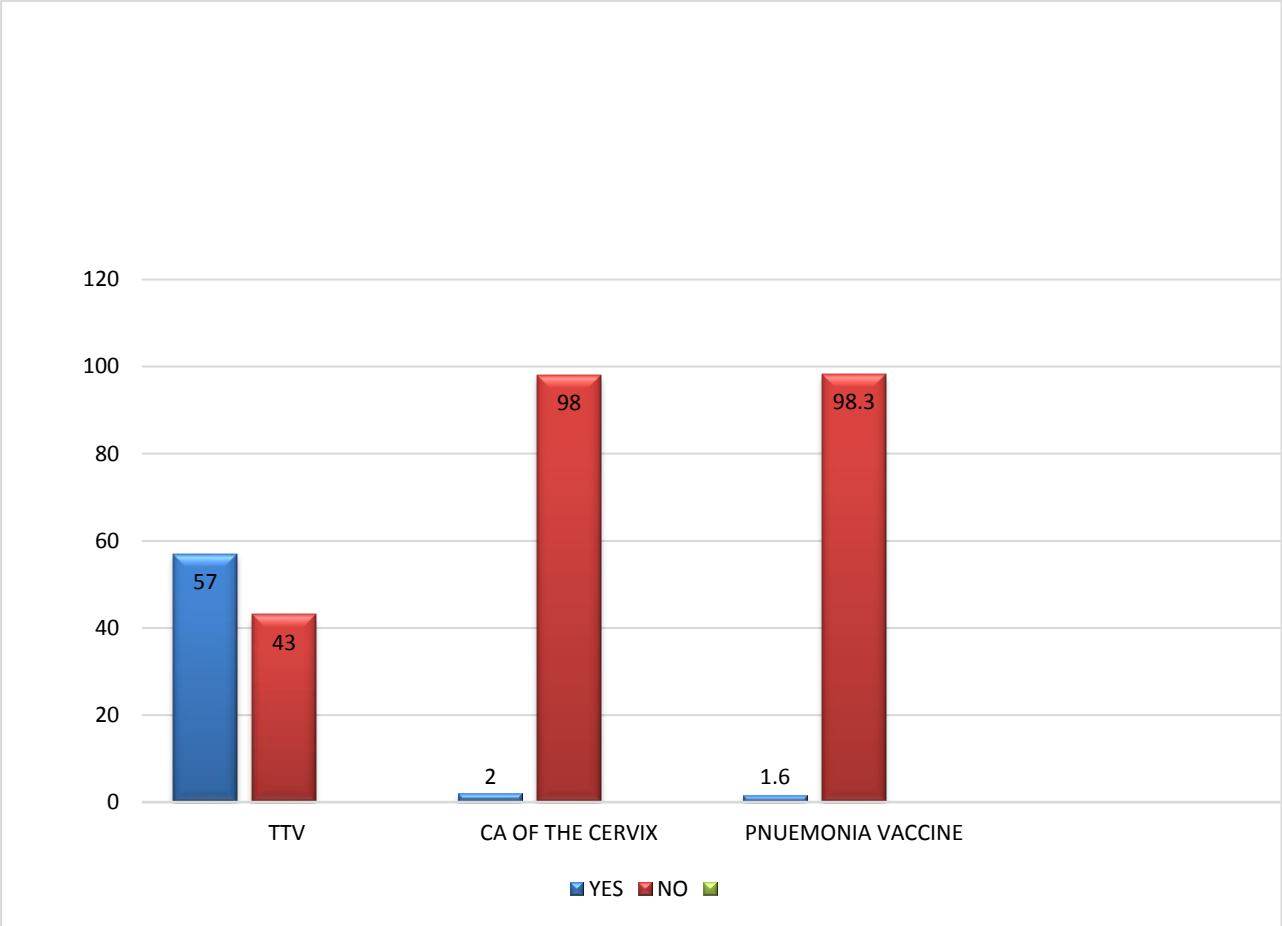


Figure 5.16: Vaccines given before pregnancy

5.2.4.5 Health promotion messages on preconception care

About n=124 (41.3%) got the message that one should be in good health before conception but n=176 (58.6%) did not know that couples need to be in good health before conception. Over half n=159 (53%) of the respondents were aware that laboratory assessments should done to detect conditions that can be treated before conception while n=141 (47.0%) were not aware of that message. One hundred thirty-one (43.4%) heard that pregnancies need to be planned while n=169 (56.3%) did not know anything about planning for pregnancy. Message on HTSP was known by n=75 (25%) of the respondents while n=225 (75%) did not know on healthy timing of pregnancy. One hundred and nineteen 119 (39.6%) knew about preparation to have a healthy pregnancy

while n=181 (60.3%) did not know that one need to prepare to have a healthy pregnancy. Refer Table 5.4 and Figure 5.17.

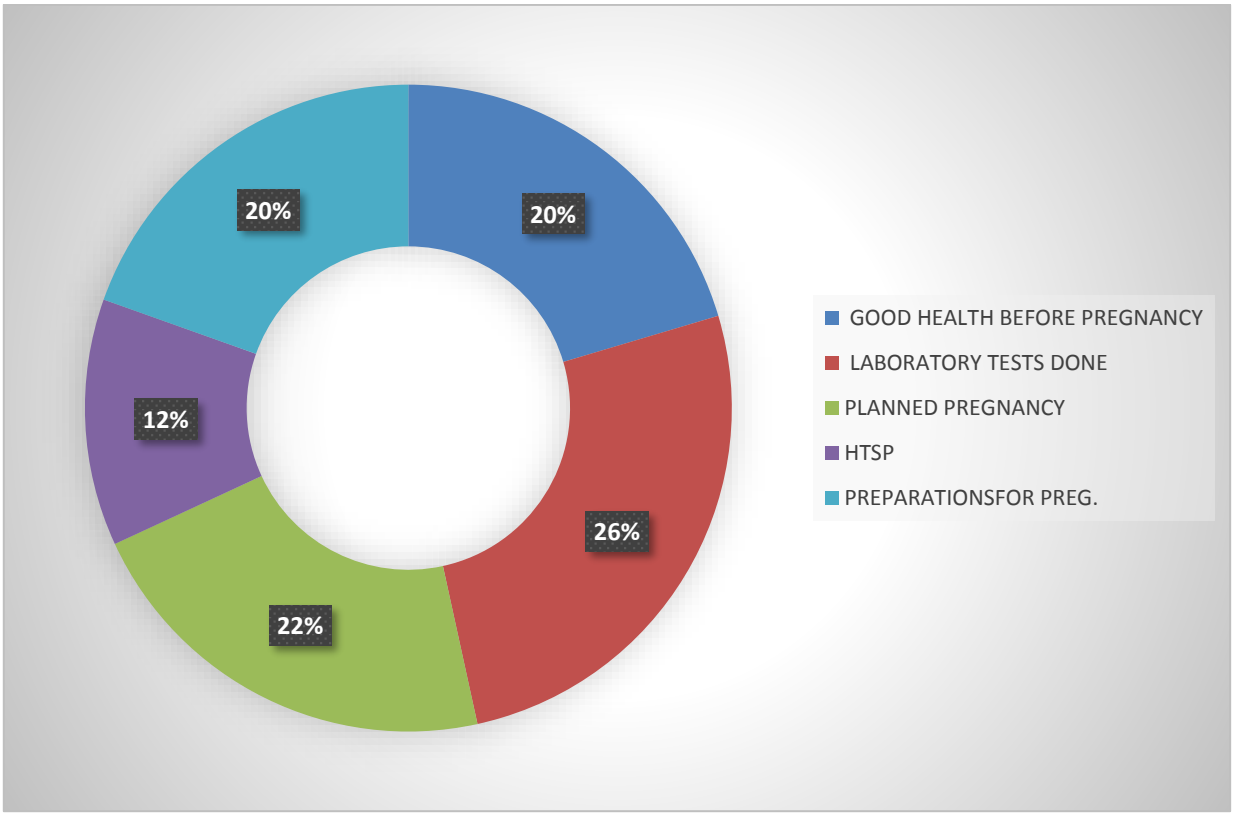


Figure 5.17: Health promotion messages received

5.2.4.6 Source of information on preconception care

Radio was one of the source of information for n=116 (38.6%) respondents, n=44 (14.6%) accessed the information on PCC on television, n=74 (24.6 %) of the respondents heard the information on PCC at the antenatal clinic. About n=125 (41.6%) heard the information from the hospital while n=21 (7%) got the information from church. Some of the respondents about n=27 (8.9%) got the information from home while n=67 (22.3%) did not know of any information on PCC (see Table 5.7 and Figure 5.18).

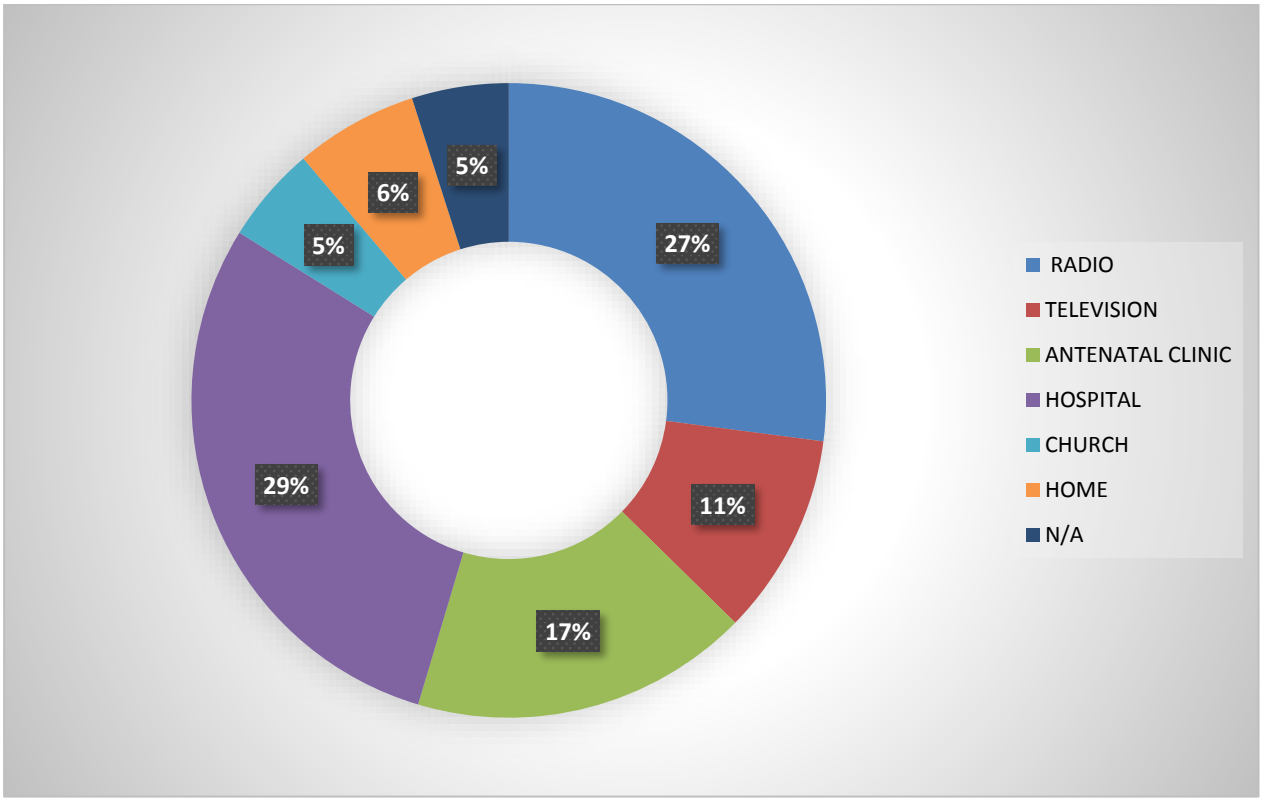


Figure 5.18: Access to information

5.2.5 Environmental, genetics and social hazards

Table 5.8: Screening from home, genetic and social hazards

Screening from other ailments	Yes	No
	n (%)	n (%)
Screening form environmental and genetic factors:		
Home near factory	18 (6)	282 (94)
Contact with chemicals	34 (11.3)	266 (88.6)
Medications that harm the foetus	99 (33)	201 (67)
Counselled on genetics	108 (36)	192 (64)
Counselled on preferred sex	22 (7.3)	278 (92.6)
Information about genetics	86 (28.6)	214(71.3)
Drugs taken during pregnancy	73 (24.3)	227 (75.6)
Drugs affecting foetal development	78 (26)	222 (74)
Genetically inherited factors affecting pregnancy:		
Multiple gestation	131 (43.6)	169 (56.3)
Diabetes	73 (24.3)	227 (75.6)
Rh factor	24 (8)	276 (92)

5.2.5.1 Environmental factors

Only n=18 (6.0) of the respondents indicated that their homes are allocated near the factory while the majority n=282 (94.0) had their homes away from the factories. About n=34 (11.3%) indicated that they are in contact with chemicals while the rest n=266 (88.6%) were safe from chemicals that could be a potential harm to the foetus. In addition, n=99 (33%) knew some of the medications that could harm the foetus before and during pregnancy. See Table 5.8 above.

5.2.5.2 Genetic counselling

One hundred and eight (36%) of the respondents indicated at some time were counselled on genetics to ensure a healthy outcome of pregnancy. However, n=192 (64%) did not know anything about genetics and could not relate it to pregnancy. Furthermore, n=22 (7.3%) were counselled on the preferred sex of the child before conception while the majority n=278 (92.4%) were not counselled. About n=86(28.6%) had some knowledge on genetics while n=214 (71.3%) did not know anything on genetics. Results showed that n=86 (28.6%) knew about the information on genetics while n=214 (71.3%) did not know anything.

The results showed that n=73 (24.3%) of respondents knew the drugs taken during pregnancy that would cause adverse effect to the mother and the foetus while n=227 (75.6%) did not know about drugs that would cause danger to pregnancy

Men and women of childbearing age indicated that n=131 (43.6%) of the respondents had knowledge that multiple gestation is a genetically inherited factor that affect pregnancy while n=169 (56.3%) did not know. Almost a quarter n=73 (24.2%) of the respondents indicated that diabetes is one of the factors that affect pregnancy while n=227 (75.6%) did not find diabetes as a factor that can affect pregnancy. On the presence of Rh factor blood type n=24 (8%) knew that it would affect pregnancy while n=276 (92%) did know anything as in Table 5.8 above.

5.2.6 Consumption of illicit drugs

Table 5.8 indicates the consumption of illicit drugs on men and women of childbearing age that would affect foetal development during pregnancy. Just n=14 (4.6%) of the respondents indicated that they take a little alcohol, n=11 (3.6%) of the respondents indicate that take moderate alcohol and n=5 (1.7%) indicated that they take too much alcohol. However, 270 (90%) indicated that they do not take any alcohol.

Respondents that used local tobacco were n=5 (1.7%). Those that use cigarettes were n=7 (2.3%) and those that did not use any tobacco were n=288 (96%).

Table 5.9: Risk assessment done on respondents before conception in relation to their education level

Risk assessment	Yes	No	Statistic Kruskal Wallis test (X^2)	p	Education			None	Total
	n (%)	n (%)			Tertiary	Secondary	Primary		
					Mean	Mean	Mean	Mean	Mean
Respiratory problems	96 (32)	204(68)	7.33	.06	.34±.48	.24±.43	.39±.49	.33±.58	.32±.47
Cardiac disease	33 (11)	267 (89)	10.097	.02*	28±.46	.11±.31	.08±.27	.00	.11±.31
Hypertension	96 (32)	204(68)	13.823	.003*	.62±.49	28±.45	.28±.45	.33±.58	.32±.47
Anaemia	101 (33.6)	199 (63.3)	15.271	.002*	.62±.49	.26±.44	.34±.48	.67±.58	.34±.47
Malnutrition	77 (25.6)	223 (74.3)	2.376	.5	.31±.47	28±.45	.23±.42	.00±.00	.26±.44
Abdominal surgery	15 (5)	285 (95)	10.239	.02*	17±.38	.04±.19	.04±.19	.00±.00	.05±.22
Gynaecological problem	52 (17.3)	248 (82.6)	8.263	.04*	.28±.46	.16+.37	.14±.35	.67±.58	.17±.38
Reproductive health	59 (19.6)	241 (80.3)	18.734	<.001*	.45±.51	.18±.38	.14±.35	.67±.58	.19±.4
Diabetes	30 (10)	270 (90)	11.391	.01*	.28±.46	.09±.28	.08±.27	.00±00	.1±.3

X^2=Chi square, p= probability, *=significant result, n=subsample

5.3 RELATIONSHIP OF VARIABLES

5.3.1 Relationship of the education level of respondents with the risk assessment

Table 5.9 above displays the results that compare the assessments done in relation to the level of education. Kruskal Wallis test was conducted and showed a significant difference (x^2=10.097, p (0.02) relationship was found on cardiac disease risk assessment which was conducted in n=33(10.9%) of the respondents and indicated a relationship to level of education. Total mean for assessment on cardiac diseases was .32±.47, those with primary education's mean was above the total mean and it was 39±49, second was those with tertiary education that had a mean of 34±48, those with no education's mean was also above the total mean and it was 33±58 and lastly those with secondary education's mean was below the total mean and it was 24±43. Education has significant relationship with cardiac assessment (see Table 5.9 above).

Assessment for hypertension had showed significant difference of (x^2=13.823, p.003) in relation to the level of education. Total mean of hypertension assessment was .32±.47 and those with tertiary education were assessed for hypertension as the mean was above the total mean as it was .62±.49, seconded by those without education that had a mean of .33±.58, which was above the mean. Both respondents that had secondary and primary education had a mean of .28±.45, which was below the total mean (see Table 5.9 above).

Assessment for anaemia with the Kruskal Wallis test shows significant relationship with level of education as showed a significant difference of (x^2=15.271, p .002). Tertiary education and those without education had their mean above the total mean of .62±.49 and .67±58 respectively. Secondary and primary school education had their mean on anaemia assessment below the total mean which was .26±.44 and .34±48 (seeTable 5.9 above).

Assessment for abdominal surgery indicated significant difference of (x^2=10.239, p. 02). The mean was 0.05±22 while those with tertiary education were higher than the mean as it was .17±.38. Secondary, primary and those with education, their mean was below as it was .04±.19 while 00.00 for those without education. On gynaecological assessment, it indicated a significance result of (x^2=8.263, p .04). It had a total mean of .17±38. The highest mean was from those that had no education and had a mean of.67±58, seconded

by those with tertiary education that had .28±.46. Secondary and primary education had the mean below the total mean because it was .16±37 and .14±35. Assessment of reproductive health in relation to education status had some significant results of (x^2=18.734, p<001). The total mean was .19±.4. Tertiary education was higher than the mean and it was .45±.51 while those that did not have education had the higher mean of .67±.58. Secondary educated respondents had lower mean than the total mean and it was .18±.38 and the lowest below the total mean was .14±.35 for those that had primary education. Diabetic assessment had significant value of (x^2=11.391, p. 01). On this assessment, the ones with tertiary education had their mean higher than the total mean as was .09±.28. The next was those that had secondary education had a mean of .09±.27 that was higher than the mean which was .1±.3. Those with primary education had a mean of .08±.27 above the mean while those with no education had 00.00 mean (see Table 5.9 above).

Table 5.10: Use of family planning methods in relation to level of education

Family planning use	Yes	No	Statistic Kruskal Wallis test (X^2)	p	Education			None	Total
	n (%)	n (%)			Tertiary	Secondary	Primary		
					Mean	Mean	Mean	Mean	Mean
Had a sex encounter last six months	233 (77.6)	67 (22.3)	5.138	.16	.45± 67	.74±.44	.36±.57	.33±.57	.38± 61
Used a condom last sex encounter	75 (25)	225 (75)	.27	.97	.45± 67	.74± 44	.81± 39	.33±.58	.38±.61
Use of a family planning method	228 (76)	72 (24)	8.161	.04*	.72±.44	.69± 47	.83±38	1± .00	.75+ 44
Partner willingness to use FP	228 (76)	72 (24)	1.806	.61	.72± 46	.80± 40	.74± 44	.67±.58	.77+ 42
Methods of family planning:									
• None	42 (14)	258 (86)	7.713	.05*	.14±.35	.20±.40	.08± 28	.00±.00	.07± 26
• Pills	21 (7)	279 (93)	9.317	.03*	.17± 38	.04± 21	.07±.25	.33± 58	.07± 26
• IUD	21 (7)	279 (93)	34.672	<.001*	.21± 41	.01± 12	.01±.12	.00± 00	.03± 17
• Depo provera	165 (55)	135 (45)	24.317	<.001*	.14± 35	.55± 50	.64± 48	.33± 58	.55± 58
• Implants	49 (16.3)	251 (83.4)	3.953	.27	.14± 35	.12± 33	.20± 41	.33± 58	.16± 37
• Tubal ligation	7 (2.3)	293 (97.6)	3.121	.37	.07± 26	.02± 15	.02± 12	.00±00	.02± 15
• Condoms	10 (3.3)	290 (96.6)	.262	.97	.03± 19	.03± 17	.04± 19	.00± 00	.03± 18

X^2=Chi square, p= probability, *=significant result, n=subsample

5.3.2 Relationship of the education level of respondents with the knowledge on family planning

Use of family planning method had significant result in relation to the level of education of the respondents with a result of (X^2=8.161, p.04). The total mean on use of family planning method was .75±44. Moreover, the respondents with primary education had .83±38 and were above the mean. Tertiary education respondents' mean was .72±44 while those with secondary education had a mean of .69±47 and those with no education had a mean of 1±.00. The significant result was also observed on respondents that did not use any family planning method. Those who used family planning method had (x^2=7.713, p.5) and a total mean of .07±26. The respondents with secondary education had a high mean of not using any family planning methods with a mean of .20±40, those with tertiary education that had a mean of .14±35. The one with primary education had a mean of .08±28 while those that had no education the non-use of family planning method was .00±00.

Use of contraceptive pills had a significant result of (x^2=9.317, p.03) and a mean of .07±26. On use of contraceptive pills, the respondents with a higher mean where respondents without any education that had a mean of .33±58 and tertiary education that a mean of .17±38. Secondary and primary school educated respondents had.04±21 and .07±25. Use of IUD yielded a significant result of (x^2=34.672, p. <001). The respondents with tertiary education had a higher mean of .21±41 than the total mean that was .03±17 and those without education had a mean of 00.00. The respondents with secondary and primary education had a mean of below the mean on use of IUD, which was .01±12. Use of depo provera had a significant value towards education status of the respondents with Kruskal Wallis test of (x^2=24.317, p. <001.). The total mean was.55±58. The respondents with secondary and primary education had their mean higher than the total mean as had .64±48 and 55±50 respectively. Those without education of use of depo provera had a mean of .33±58 below mean and those with tertiary education had a mean below the total mean of .14±35. A sexual encounter last six months, use of a condom, partner willingness to use FP, use of implants and tubal ligation had no significant result to the level of education of the respondents (see Table 5.10 above).

5.3.3 Information and care provided before pregnancy in relation to the level of education

Table 5.11: Information and care provided before pregnancy in relation to the level of education

Care provided	Statistic Kruskal Wallis test (X^2)	p	Education			None	Total
			Tertiary	Secondary	Primary		
			Mean	Mean	Mean	Mean	Mean
Planning to get pregnant	5.123	.16	.55±.51	.62±.49	73±.45	.67±.58	.66±.47
Given information which assist in having a healthy	8.778	.04*	.79±.41	.80±.40	.67±.47	.33±.58	.74±.44
Sought for care when planning to get pregnant before conception	6.666	.47	.62±.49	23±.42	17±.38	.33±.58	.20±.47
Pregnancy planned	4.066	.25	.66±.48	.72±.45	60±.49	67±.58	66±.48
Ready to take care of your pregnancy	6.424	.93	.90±.31	.91±.28	.87±.34	1.00±.00	.89±.31
Psychologically prepared to take care of the pregnancy	15.760	.001*	.86±.35	.85±.36	.52±.50	.00±.00	.55±.50
Partner prepared to support you during this pregnancy	.407	.939	.97±.31	.91±.28	.95±.21	1.00±.00	.96±.20
Enough income to support you during pregnancy	19.445	.00*	.93±.26	.80±.41	.61±.49	1.00±.00	.73±.45
Supportive relationship with your partner	8.048	.05	.97±.26	.96±.21	.95±.21	1.00±.00	.96±.20
Discuss plans care for the pregnancy with your partner	3.718	.05	.83±.38	.82±.39	.80±.40	.67±.58	.81±.39
Emotional support	8.048	0.045*	.83±.38	.61±.49	.55±.50	.67±.58	.61±.49
Resource provider	3.718	.30	.83±.38	85±.34	92±.28	1.00±.00	88±.30
Assist house hold chores	.95	.81	72±.38	.65±.48	.63±.49	.67±.58	.65±.48

X^2=Chi square, p= probability, *=significant result, n=subsample

The information that was provided to the respondents that had significant result according to the level of education of the men and women of childbearing age were as follows:

- Information given which assist in having a healthy pregnancy.
- Psychological preparation to take care of pregnancy.
- Enough income to support them during pregnancy and emotional support provided before conception.

Table 5.11 displays the results that indicate that men and women of childbearing age had information to assist them in having a healthy pregnancy that provided a significant result according to Kruskal Wallis test of (x^2=8.778, p.04.). The total mean was .74±.44 while the highest mean was from men and women of secondary education that had a mean of .80±.40, those with tertiary education had a mean of .79±.41. The respondents with primary education and those that did not have any secondary education mean was below mean. According to the information that assisted in having a healthy pregnancy, the results were .67±.47 and .33±.58. The significant result also came from the information that indicated if the respondents were psychologically prepared to take care of the pregnancy that had (x^2=15.760, p.001). Those that had tertiary education had result above the total mean, which was .55±.50. Tertiary education respondent had a mean of .86±.35, followed by those with secondary education that had a mean of .55±.36, primary educated respondents had .52±.50 while the ones with no education the mean was .00±.00. The more people are educated, the more they were prepared psychologically to take care of the pregnancy.

Men and women of childbearing age were asked if they had to prepare enough income to support them during pregnancy. This yielded a significant result of (x^2=19.445, p.00). The respondents that had no education had a mean of 1.00±.00. This was the highest among the three from the total mean. Respondents with tertiary education had a mean of .93±.26. This was above the total mean of 73 ±.45. Those with secondary education had a mean of .80±.41, followed by those that had primary education that had.61±.49.

Provision of emotional support by the spouse provided a significant result (x^2=8.048, p.0.045). On this variable, the mean was .61±.49. The higher the education the more spouse provided emotional support. Tertiary education had a mean of 83±.38, secondary education had .61±.49 while those without education the mean was higher than the ones with secondary education with a mean of .67±.58. Respondents with primary education had the lowest mean of .55±.50.

5.4 CROSS TABULATIONS OF VARIABLES TO INDICATE RELATIONSHIPS

5.4.1 Relationship of age groups with planning to get pregnant and level of education

Table 5.12 Cross tabulation of age, level of education and plans to get pregnancy

Age range	Planning to get pregnant		Level of education in relation to age				
	Yes	No				None	Total n (100%)
	n (%)	n (%)	Tertiary	Secondary	Primary		
			Mean	Mean	Mean	Mean	Mean
18-20	35 (87.5%)	6 (15%)	2 (5)	17 (42.5)	19 (47.5)	2 (5)	40
21-25	53 (76.8%)	16 (23.2%)	8 (11.4)	31 (44.9)	30 (43.5)	0 (0)	69
26-30	42 (59.2%)	29 (40.8%)	9 (11)	38 (47)	34 (42)	0 (0)	81
31-35	62 (56.4%)	48 (43.6%)	11 (11)	48 (47)	41 (40)	1 (0.01)	102
Total			**30**	**135**	**124**	**3**	**292**

Table 5.12 above displays the results for different age groups on their views on planning to get pregnant and level of education in relation to PCC knowledge. The 18 to 20 age group had 35(85%) of the respondents planning to get pregnant while only n=6 (14.6%) did not plan to get pregnant. In addition, n=19 (47.5%) of this age group had primary education, n=17 (42.5%) had secondary education n=2 (5%) only had tertiary education and n=2 (5%) had no education. This age group is crucial to received PCC messages as the majority needed to be pregnant and education strategies should be planned for primary and secondary group that is in majority.

The age group between 21-25 years had n=53 (76.8%) of the respondents that needed to be pregnant and n=16 (23.2%) did not plan to get pregnant. The majority of respondent also are having secondary and primary education which were n=31 (44.9%) and n=30 (43.5%) respectively. The respondents between 26-30 years also the majority indicated that are planning to get pregnant (42; 59.2%) and n=29 (40.8%) did not plan to get pregnant. Most of the respondents have secondary and primary education like the other age groups as had n=38 (47%) and n=34 (42%) respectively. The last age group of between 31-35 also the majority n=62 (56.4%) indicated to plan for pregnancy while n=48 (43.6%) did not plan to get pregnant. The same trend is seen that the majority have secondary and primary education n=48 (47%) and n=41 (40%) secondary and primary education respectively. Only n=3 (1.02%) did not attend any school. The highest group that had highest number of tertiary education were between 31 to 35 age group that had n=11 (11%) of the respondents and the second one was the age group between 26-30 that had n=9 (11%). The results have indicated that most men and women of childbearing age range between 18 to 35 years and have primary and secondary education.

5.5 CONCLUSION

The discussion on findings clearly provide the evidence that Malawi need to have preconception guidelines that would be implemented in health care facilities to improve maternal and neonatal morbidity and mortality. What is done on the ground is not enough to prepare couples have a healthy pregnancy. Most of the men and women did not know the concept on PCC and most of them report for antenatal care services but very few took an initiative to prepare before the next pregnancy. Some of the associating factor that would improve provision of PCC is to improve universal education to all women and men of childbearing age.

CHAPTER 6

GUIDELINES ON PRECONCEPTION CARE IN BLANTYRE URBAN MALAWI

6.1 INTRODUCTION

The study was conducted in Blantyre Urban District to identify the information and care that the men and women of childbearing age received regarding to PCC. The aim of the study was to develop relevant preconception interventions or strategies that would assist to improve maternal and newborn outcome in Malawi.The reduction of maternal and childhood mortality and morbidity requires provision of continuum of care that from pregnancy, childbirth, childhood, and adolescent. Interventions before pregnancy occur can increase the health and well-being of adolescents, adult women and men and improve subsequent pregnancy, and child health outcomes. Improving livelihood and coverage of secondary and higher education is associated with sustainable family planning utilization (Gizachew Balew, Cho, Tammy Kim & Ko 2015:16). Universal education to all Malawians would improve utilization of PCC.

The objectives of the study were to

- explore and describe the level of knowledge women of childbearing age on HTSP/PCC
- explore and describe the level of knowledge men of childbearing age on HTSP/PCC
- establish the time when information about HTSP/PCC is provided to prospective parents that intend to get pregnant
- assess a relationship between the PCC information provided with the age of the mother, education level, parity, intended pregnancy and socio-cultural factors of the mother
- develop relevant preconception interventions that would assist to improve maternal and newborn outcomes in developing countries

The study used Pender et al's (2011:1) HPM to develop health promotion messages that would enhance the provision and use of PCC in Blantyre Urban in Malawi. According to Pender et al (2011:5), individual characteristics and experiences influence health behaviour. If there is perception of the benefit of the behaviour, people experience the desired outcome of health. Women and men of childbearing age would practice good health habits before pregnancy to prepare to have a health outcome of a healthy mother and the newborn. Esperat, Feng, Zhang and Owen (2007:1) used the HPM as a theoretical framework to develop health care lifestyles and optimal use of health care services to improve pregnancy outcomes. The study used the HPM to promote the people to actively regulate their own behaviour to improve their behaviour and lifestyles during the preparation to conception. Individuals and couples were more proactive to seek risk screening to infection that have impact to pregnancy and will practice HTSP to prevent complications of pregnancy that occur when pregnancy come too soon and too late. The study followed Pender's HPM to link the concept that PCC is an intervention that will promote health outcome of the mother and their newborn. Polit and Beck (2012:127) highlight that people will make a decision to comply with health behaviour like use of contraception, preventive health screening and take a good nutritious diet if they are able to perceive the desired outcome of the health behaviour benefit. Designing programmes in low income, pregnant women on health promotion behaviours should be a priority to improve health of the people in Blantyre, Urban District in Malawi so that maternal mortality rate can be reduced. Esperat et al (2007:287) conclude that health behaviours encompass health behaviours that need to be adopted and preventive action that improves health status of the people.

Dean et al (2014a:3) provide a framework that can be used to guide the research to be conducted. The model illustrates that care and information given before and between pregnancies with the favourable environmental factors, essential health care services to adolescent girls and women enable good healthy outcome of mothers and babies. Essential services like appropriate birth spacing, healthy diet, physical activity, immunisation and management of infectious diseases, genetic counselling and preventing and treating substance abuse would produce healthy outcome of mothers and babies. The figure 6.1 below shows the conceptual framework that the study followed.

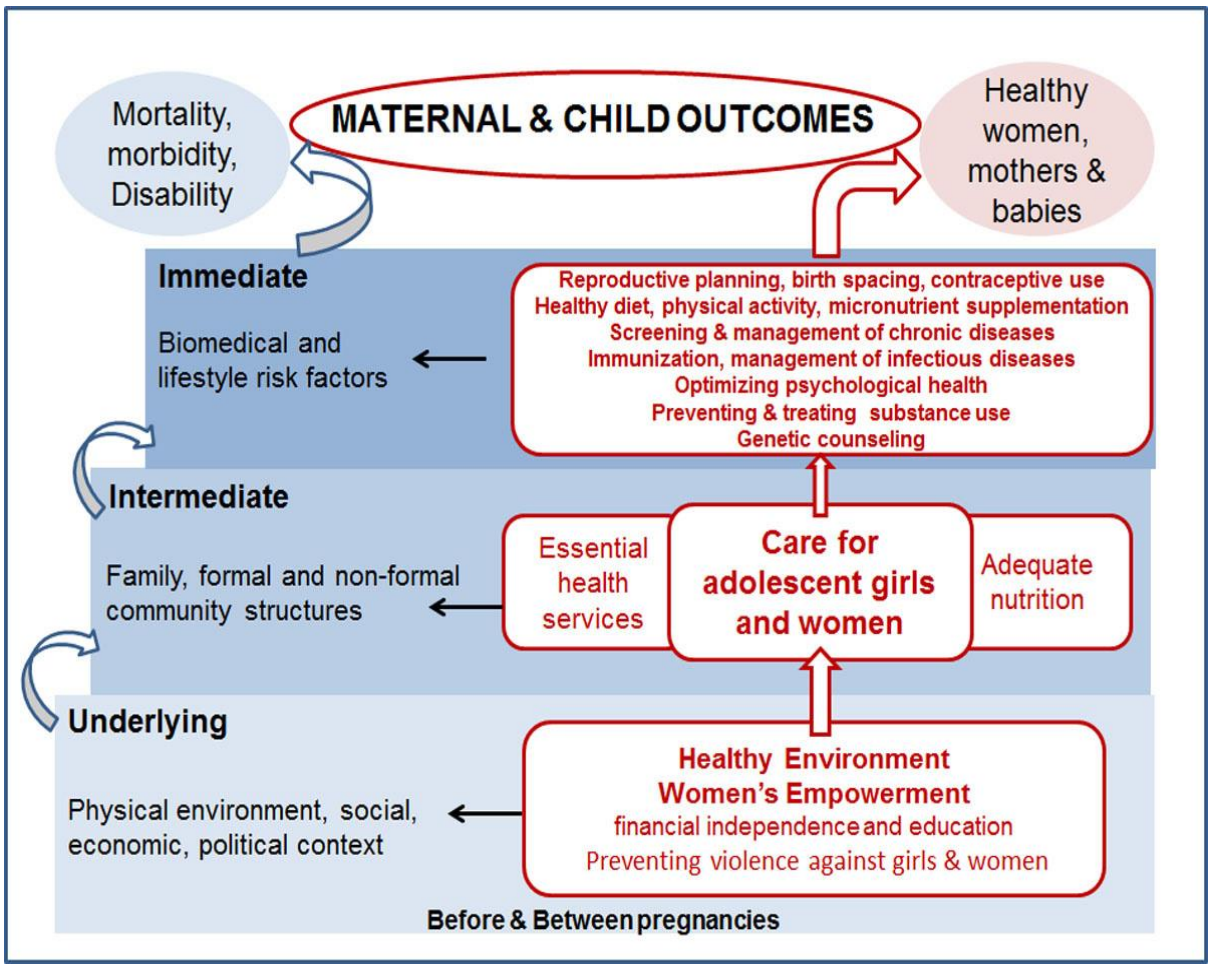


Figure 6.1: Conceptual Model Underpinning the study

(Dean 2014a:4)

6.2 SUMMARY OF FINDING FROM THE STUDY

The findings indicated that the clients did not get a comprehensive package of PCC because there were gaps that need to be filled and strategies to improve PCC should be put in place. The literature review done extensively indicated interventions that have been put in place in other countries to improve maternal and newborn outcome through provision of PCC. Dunlop, Brian and Frey (2007:82) highlight the recommendation that should be incorporated to improve preconception practice and promotion of changes in individual behaviour, health policy and public health strategies to improve maternal and newborn health. The Centres for Disease Control and Prevention have published national recommendations for improving preconception health and health care in response to unfavourable aspects of the health status of women and children in the United States (Johnson et al 2006:2) see Table 6.1. Literature indicates that programmes should be in place to provide PCC that will improve pregnancy outcomes (Gal, Khermesh, Barak, Lin,

Lahat, Reznik Wolf, Lin, Pras & Levanon 2016:1; Zhou, Zhang, Wang, Shen, Tian, Chen, Acharya & Li 2016:1). Barriers to contraceptive use have been identified extensively in literature and in the quantitative study conducted. Some of the barriers have been lack of appropriate guidelines to update health care providers to give the recommended interventions to improve PCC (Mazza et al 2010:1; Kitamura, Fetters & Ban 2005:1; Kura, Vince & Crouch-Chivers 2013:1).

Most of the respondents did not prepare psychologically for pregnancy according to the conceptual framework by (Dean et al 2014a:4). One of the underlying factors to provide PCC is to have a conducive physical, social, economic, and political context that empowers individuals like men and women to access PCC. Freda, Moos and Curtis (2006:45) report that health promotion strategy increased 60% of primary care providers who participated in giving age-specific PCC that assisted couples to prepare for parenthood thereby reducing risks during prenatal period. According to Table 6.1, recommendation 8 says: Blantyre Urban District in Malawi should intensify availability of public health programmes and strategies infuse and integrate components of preconception health into existing local public health and related programme, including emphasis on those with prior adverse outcomes. This is one of the strategies that can generate availability of preconception health care in health care facilities. Noris, Chee Ho, Rashed, Vinding, Skau, Biema, Aagaard and Priya Matzen (2016:2) indicated that there is pre-pregnancy care in Malaysia to provide maternal and child health services that comprise premarital HIV screening and general wellness programme. Wellness clinics assist men and women to achieve a safe and successful pregnancy by screening for risk factors and counsel future mothers to reduce maternal and prenatal morbidity and mortality. Masho, Cha, Charles, McGee, Karjane, Hines, and Kornstein (2016:1) identified that preconception counseling may provide an opportunity to discuss on interventions that should be done to ensure one has optimum health before commencing pregnancy like maintaining healthy eating habits.

6.2.1 Psychological preparation before conception

The quantitative study that was conducted showed clearly that men and women of childbearing age did not plan for the pregnancies. Literature indicates that one needs to be psychologically prepared before pregnancy. Hutchinson, Moore, Propper and Mariaskin (2008:441) assert that unplanned pregnancies make depressive symptoms,

which are correlated with themes of separation and attachment. According to Emotional Prepared for Pregnancy (2016), women need to be mentally prepared for a good pregnancy outcome. Pregnancies need to be planned as a couple to have a good positive outcome. Each pregnancy needs support of the man and woman to have a healthy outcome. Hutchison et al (2008:441) highlight that prenatal exposure to maternal anxiety and depression influence foetal adverse effects in the uterus as they affect foetal heart rate, cortisol levels and there is high susceptibility to psychopathology of the infant. If first time fathers are associated with poorer quality of intimate relationship, this leads to dissatisfaction with social support that results into psychological distress (Boyce, Condon, Barton & Corkindale 2007:78). One needs proper preparation to have pregnancy so that there can be proper development of the foetus if there is a healthy relationship between the couple. Tjoa, Pare and Kim (2010:565) indicate that depression in pregnancy can negatively affect maternal and foetal health. Some studies indicate that a couple that has less mutual relationship among themselves such as cohabiting women are less likely to plan for pregnancies than married women (Lanchance-Grzela & Bouchard 2009:142). Women who indicated that they have been exposed to violence while pregnant were 24.1% and they also indicated that the violence continued while they were pregnant (Lanchance-Girzela et al 2009:142).

There is need to provide counselling to couples to have healthy relationship before pregnancy in order to have a healthy outcome of pregnancy. Mack and Chavez (2014:2939) highlight that 28% of mothers contemplated having an abortion when they discovered that they are pregnant without appropriate plan. In Mark and Chavez's (2014) study, most of the patients were not provided with information to assist them have a healthy pregnancy. Very few were examined to identify risk factors that would affect their pregnancy but most of them indicated that their spouses were prepared to provide support during pregnancy. Davis, Vyankandondera, Luchters, Simon and Holmes (2016:4) highlighted that there are barriers to involve males in health care settings as there are very few men that are health providers and there is lack of skill among care providers to handle couples. Men are mostly not involved in provision of care. Some indicated that they prepared enough income to support them during pregnancy. Nutrition that would support them to grow healthily was provided but very few knew that they need screening for chronic conditions, STIs and checking haemoglobin that would affect them during pregnancy.

According to recommendations by the Centre for Disease Control (USA), extensive literature review and findings from Blantyre Urban clinics, there is need to discuss reproductive goals and issues affecting pregnancy to couples like medication, healthy conditions and activities that affect fertility. Male reproductive health issues should be an integral part of every wellness visit. More importantly, men's understanding of reproductive health should be assessed. Furthermore, linkages between health services along the reproductive maternal health improve health care that will provide an opportunity for PCC counselling should be identified (McDougal, Rusch, Silverman & Raj 2016:1). Health-seeking behaviours assist patients to access health promotion messages that would help them plan for healthy pregnancies. There is evidence that attending for reproductive health care services by women in Bangladesh increased contraceptive uptake but also increased utilisation of maternal health services (McDough 2016:435). Routine screening of maternal depression at every internatal visit provide support and care that would be at risk of depressive disorders (Lu et al 2006:1). Psychological support should be provided during PCC to allow the couple to adjust and be prepared to care for the pregnancy.

6.2.2 Physical/sexual/emotional abuse

There are reports of increased domestic violence that causes an increase of uplanned pregnancies among women in Turkey (Arslantaş, Adana, Ergin, Gey, Biçer & Kıranşal 2012:2). Lu et al (2006:1) suggest that routine screening of family violence during every visit should be done to men and women of childbearing age. Several screening instruments can be used to detect intimate partner violence (IPV) that has some effect on pregnancy. Women who experience intimate partner violence during pregnancy tend to experience depressive symptoms that would affect the mother and the baby (Ogbonnaya, Macy, Kupper, Martin & Bledsoe-Mansori 2013:1). Ogbonnaya et al (2013:2114) report that there are adverse effects that would occur to the mother and baby if there is IPV during pregnancy. Lachance-Grzela and Bouchard (2009:141) concluded that planning pregnancies contribute to parents' wellbeing especially in a supportive relationship. These include increased risk of preterm delivery, premature rupture of membranes, low birth weight, foetal trauma, and neonatal death. Women that are in an abusive relationship are at risk of IVP. The consequence of a mother that has had a traumatic experience is that they would likely exhibit risky alcohol consumption behaviour when they become pregnant. This would affect their foetus and usually are at risk of having unintended

pregnancies (Choi, Abler, Watt, Eaton, Kalichman, Skinner, Pieterse, & Sikkema 2014:9). Lie, Robson and May (2008:7) highlighted that if women are counselled and well informed in their choices they experience good psychological outcome from the crisis encountered. In the study partners provided support during pregnancy emotionally and assisting with household chores which is an indicator that men are providing support during pregnancy. Screening for intimate partner violence will assist to counsel the client as they prepare to have pregnancy.

Intervention/strategy during preconception care: PSYCHOLOGICAL CARE

- During any visit by a couple to a wellness clinic when pregnancy is desired ensure that they are psychologically prepared to take care of the pregnancy, healthy to carry a pregnancy and ready to support pregnancy. Each couple to have a reproductive health plan.
- All women of reproductive age should be screened for current, recent past, or childhood physical, sexual, or emotional interpersonal violence and referred to appropriate resources when needed.

6.2.3 Reproductive health information: family planning and health messages

From the quantitative study that was conducted, many of the respondents wanted to be pregnant soon and most of them were sexually active indicating that could be pregnant or at risk of acquiring sexually transmitted infections. Most of them (75.5%) were using a family planning method and even spouses were willing to learn more information on family planning. Since most of the respondents had secondary education that was correlated highly with family planning use, Ajaero, Odimegwu, Ajaero and Nwachukwu (2016:1) stated that there is likelihood in the use of family planning by respondents with secondary education, married and with good economic status. In addition, Dean et al (2014b:4) highlight in the conceptual framework that women empowerment is one of the underlying factors that would promote PCC. Furthermore, Ajaero et al (2016:2) also stated that use of mass media improves maternal and reproductive health in Nigeria. Lack of information on family planning services increase the risk of women conducting unsafe abortions that put their lives at risk (Vallely, Homiehombo, Kelly-Hanku and Whittaker 2015:1). Refer (table 6.2) on strategies to improve reproductive planning.

The messages on family planning are sufficient to change attitudes and stimulate discussion on family planning (Ajaero et al 2016:2). Kane, Kok, Rial, Matere, Dieleman, and Broerse (2016:1) indicate a change in social norm of having as many children as possible is changing as people want to take good care of children and provide them with good education. Kane et al (2016:5) indicate that respondents recognise that getting pregnant immediately after delivery was not good for the unborn child and there is a need to have sufficient time between two pregnancies. Despite some couples recognising the importance of spacing the pregnancies, Yohannes, Wondafrash, Abera and Girma (2011:1) point out that 57% of women were practising short birth interval length of 33 months. It is important to practise optimal birth interval for health of the siblings and the mother. Moreover, Yohannes et al (2011:3) maintain that many women of childbearing age became pregnant while wanting to limit childbearing. In a study conducted by Salisbury, Hall, Kulkus, Paw, Tun, Min, Chotivanich, Srikanok, Ontuwong, Sirinonthachai, Nosten, Somerset & McGready (2016:1) report that the gap on prevalence of family planning methods was low uptake of long acting contraceptive methods, lack of emergency contraception and misconception surrounding female sterilisation. McDougal et al (2016:12) indicate that pre-pregnancy contraceptive use is associated with patients that attended antenatal clinic. This indicates that people who utilise health care services have health promotion messages that could improve their health status. Use of family planning in Thailand is even practised by young women just married under 17 years old (Salisbury et al 2016:5). In the latter study, the commonly used method of family planning was depo provera. Mosha, Ruben and Kakoko (2013:2) reported that most women discontinued use of contraception because of the side effects. Unintended pregnancies are mostly common and most women have detrimental effects during pregnancies that come unwanted, frequently and too many.

However, Speizer and Lance (2015:1) report that given that injections are most common method used in all three of African studies, some become pregnant on the method because of incorrect use of injections, starting and stopping the method because of the side effects, missing and delaying follow-up dates. A study done in Ghana indicated that women used injectables as a family planning method than other methods (Amu & Nyarko 2016:3). Respondents did not frequently use other long acting family planning methods such as IUD, female sterilisation and pills. Hoffman, Guindon, Lavis, Randhawa, Becerra-Pasada, Boupha, Shi and Turdaliyeva (2016:1) indicate that the significant gaps exist in health care providers' knowledge and practises relating to family planning and IUD

provision. Health care providers need skills to provide a wide range of family planning methods for clients to use to space and limit their pregnancies. Khan and Shaikh (2013:1) report that the use of IUD by patients is hindered because clients are reluctant to use IUDs because of a number of myths and misconceptions associated with the method. Providers have challenges to provide the method because of inadequate counselling skills, lack of competence of providers and lack of appropriate resources by the government and training to promote IUD utilisation.

Even in other parts of the world like South Sudan, people are under pressure to increase their family sizes to increase the population owing to loss of people because of the civil war (Elmusharaf, Byrne & O'Donovan 2017:1). Marriage is considered complete with the birth of the child and a woman who does not conceive is considered a shame to the society and a husband is allowed to marry other wives that would bring pregnancy in the home (Elmusharaf et al 2017:5). Women empowerment is a challenge as Mosha, Ruben and Kakoko (2013:1) highlight that few women participated in decision-making on family planning and number of children despite many of them having the view that family planning methods helped them to plan space children and improve general health situation. Some strategies used to promote male involvement in family planning were to consult man's close friend, mother in-law who favour family planning and seek advice from older women to gain support (Aransiola, Akanyemi & Fatusi 2014:10). According to Mehata, Paudel, Dotel, Singh, Poudel and Barnett (2014:1) some of the barriers to proper contraception use include lack of education and exposure to media that make client to have little knowledge to use family planning methods. Family planning methods would assist all men and women of childbearing age to use PCC that promote couple to have improved birth outcomes.

There is prevalence of fertility desire among HIV positive couples. Demissie, Tebeje and Tesfaye (2014:1) indicate that the desire of fertility is influenced by age of 18-29 years, non-availability of biological living children, community pressure, duration of HIV diagnosis, and partner fertility. When planning for reproductive health programmes consider the fertility prevalence of HIV positive couples on use of contraceptives. Some of the interventions of birth spacing and limitation improved owing to exposure to community-based services and improved child survival through community male mobilisation combined with doorstep provision of family planning services (Dalaba, Stone, Krumholz, Oduro, Phillips & Odongo 2016:1). There is still a demand of family planning

services as King, Khana, Nakayiwa, Katuntu, Homsy, Lindksvist, Johansson and Bunnell (2011:1) indicate that pregnancies were unintentional and occurred because people believed that they were infertile because of HIV infection. Ongoing reproductive health education and family planning services should be provided on restoration of fertility after ART initiation (King et al 2011:1). One of the strategies used by the Malawian Government (2017:120) is to prevent mother-to-child transmissions and unintended pregnancies among HIV positive individuals, which should be intensified during PCC.

The messages on PCC should be on maintaining good health before conception. These include health promotion messages like eating healthily, exercises and provision of supplementations when pregnancy is anticipated. Screening for various ailments that could affect pregnancy should be done for early treatment and appropriate counselling. Messages should include planning for pregnancy at the right time and avoid unintended pregnancies. Hancock, Chibwesha, Stoner, Vwalika, Rathod, Kasaro, Stringer, Stringer and Chi (2015: 5) reported strongly that provision of quality family planning services can increase uptake, prevalence and continuation of contraception that can enhance use of PCC. Respondents in the study had no knowledge on what is done during the preconception period. A study done in Italy by Mastroiacovo, Nilsen, Leoncini, Gastaldi, Allegri, Boiani, Faravelli, Ferrazzoli, Guala, Madrigali, and Scarano (2014:1) indicated a great need of initiating PCC programmes that would improve maternal and neonatal health.

The most favourable place where the respondents had received messages was at the hospital 41.5% and from the radio 38.4%. Health campaigns, education and posters should be provided at health facilities to assist patients to have awareness on PCC information. Social media, television and newspapers could be used to target some of the patients that have access. Peer group counselling and male involvement could be used to disseminate the information so that all men and women of childbearing age could be knowledgeable and access PCC. Other places that could be source of information to provide health promotion messages is at social gatherings like church, Counselling sessions for young people or the newlyweds. Malouf, Redshaw, Kurinczuk and Gray (2014:10) provided evidence that health promotion messages can be provided using an educational video. Preconception health messages could be provided to the people by using the educational video.

Intervention and strategy: PROVISION OF INFORMATION

- Consumer awareness on family planning methods. Increase public awareness of the importance of preconception health behaviours and increase individuals' use of PCC services using information and tools appropriate across varying age, literacy, health literacy, and cultural/linguistic contexts.

6.2.4 Healthy timing and spacing of pregnancy message

Most of the respondents in the study believed that the appropriate healthy timing and spacing of pregnancy is more than three years and less than two years. This indicated a knowledge gap among participants. From a study conducted in Tanzania, Muganyizi et al (2013:1) indicate that health care providers should intensify educational messages on timing and spacing of pregnancy that would promote healthy outcomes. Literature concurs that babies born to women with intervals that are shorter than six months, has more risk of increased risk of many adverse neonatal and perinatal outcomes (Sridhar & Salcedo 2017:1; Yakoob et al 2009:1; DaVanzo, Hale, Razzaque, and Rahman 2007:2). Muganyizi et al (2013:1) highlight that when there is healthy timing and spacing of pregnancy means that pregnancies are scheduled at an appropriate time, spaced at a recommended interval and limited according to an individual's need.

Couples and individuals of reproductive health should acquire important messages on HTSP. Yakoob et al (2009:5) illustrates that short inter pregnancy intervals have been identified as a risk factor for poor pregnancy outcomes particularly infant mortality in low- and middle-income countries. As most of the respondents in the study thought, long inter-pregnancy intervals exceeding six years were not recommended as timing and spacing of pregnancy is associated with increased risk of adverse pregnancy outcome (Yakoob et al 2009:5). Conversely, optimally spaced births which should come at interval of 18-23 months was recommended as ideal and reduces risk of perinatal outcomes (Yakoob et al 2009:5). In addition, Sridhar et al (2017:2) indicate that the association of short inter-pregnancy interval causes increase in preterm births, low birth weight and small size for gestation age. Khanal, Adhikari, Karkee, and Gavidia (2014:2) reported that the postanatal period provide a specific opportunity for counselling on family planning that would assist mothers to have time to rest before another pregnancy. Malawi has an increase in preterm birth because of closely spaced pregnancies, especially after an abortion or a stillbirth. It is high time for health care policies that promote availability of

contraceptive methods that would promote women's ability to space their pregnancies to have a healthy outcome (Sridhar et al 2017:8). Hindin, Rodriguez, Gonsalves and Say (2015:5) argue that the increased use of contraception among adolescents prevents unintended rapid repeat pregnancies less than two years that have increased maternal and neonatal adverse outcomes.

Respondents did not have an idea on the recommended time to have pregnancy after an abortion. Yakoob et al (2009:5) indicate that large numbers of women seek to become pregnant very quickly after last pregnancy even when the underlying cause of the first adverse outcome remains unresolved. The common practice of men and women of childbearing age is that there is need to have another pregnancy as soon as they experience pregnancy loss. Tilahun, Dadi and Shiferaw (2017:4) found that frequent abortions happen to women that have had a previous abortion. HTSP messages through PCC is one of the strategies to prevent unnecessary abortions. The recommended health timing and spacing of pregnancy after an abortion is six months and client should be informed about the message during preconception time. Muganyizi and Mageta (2013:3) report that after a miscarriage of the antecedent pregnancy, the index pregnancy was inappropriately spaced. Closely spaced pregnancies would accelerate the cause of anaemia and post-partum haemorrhage among childbearing women.

In Malawi, interventions should be put in place to provide education messages on HTSP as a routine family planning service according to the social and reproductive concerns of the users. Hayford and Guzzo (2010:367) reported that teenagers and women in early twenties are more unlikely to plan their pregnancies than women that are in late twenties and thirties.

Sarkar, Chandra-Mouli, Jain, Behera, Mishra and Mehra (2015:1) highlight the importance of having community-based interventions that consist counselling of young married women and husbands, family and community on effective measures increasing contraceptive use, delaying pregnancy and improving pregnancy care. In addition, Valley, Hombo, Kelly Hankers and Whittaker (2015:1) report that there is still unsafe abortion owing to absence of contraceptive information and services to avoid, postpone or space pregnancy. The incidence of abortions requires health care providers to focus on fertility desires of patients that are not stable and fluid and result in unintended pregnancies (Speizer & Lance 2015:1). Family planning programmes will help women who want to

delay or avoid childbearing age women to meet these stated fertility desires (Speizer & Lance 2015:10). Health workers should be trained to provide counselling on healthy timing and spacing of pregnancy with accessibility of family planning methods that are needed by people of childbearing age according to their needs. However, Sarkar et al (2015:5) found that persuading young couples to delay first birth was found to be more difficult in comparison to convincing birth spacing and family planning use. Nevertheless, findings by Jones, Mosher and Daniels (2012:2) indicate that the use of family planning methods increased by age as more that 75% of the women between 40-44 years use contraceptive method in the United States of America (USA). There is need to intensify community education campaigns to promote healthy timing and spacing of pregnancy among men and women of childbearing age. Use of contraceptive among women of childbearing age will assist them to have planned pregnancies and reduce complications associated with childbirth (Endriyas, Eshete, Mekonnen, Misganaw, Shiferaw and Ayele 2017:1).

Recommendations for spacing after a miscarriage or induce abortion according to WHO into (2006) is at least six months. This spacing is meant to reduce risks of adverse maternal and perinatal outcomes. Puri, Lamichhane, Harken, Blum, Harper, Darney and Henderson (2012:1) highlight that repeat abortion is becoming a problem as the legalisation of abortion encouraged unmarried sexual activity.

Good quality post-abortion care is essential to prevent death and long-term complications to prevent death and long-term complications following unsafe abortion (Arambepola & Rajapaska 2014:1). This indicates the need of education to men and women to have the next pregnancy at the recommended time. Reime, Shucking and Wenzlaff (2008:1) report that there was higher incidence of stillbirths, preterm births and very low births weight infants. Lassi et al (2014:2) highlight that shorter inter-pregnancy interval less than six months is associated with higher preterm births, low birth weight, foetal death, and small for gestation age. The recommended period for spacing pregnancy should be 18 to 23 months. Men and women of childbearing age should have their pregnancies at recommended birth intervals. There is still evidence that risks of adverse pregnancy effects were higher if the pregnancy is conceived 60 months or more. When pregnancies are too far apart more than five years, mothers have potential to develop preeclampsia and babies are born too soon, too small or with low birth weight (WHO 2006).

Intervention/strategy: HEALTHY TIMING AND SPACING OF PREGNANCY

HTSP message to achieve healthy pregnancy outcome:

- Delay the first pregnancy by using FP method of choice until 18 years old before trying to get pregnant.
- Couples should use effective FP method of choice continuously for two years before trying to get pregnant after a live birth.
- Couples can use effective FP method of choice continuously not more than five years as there are adverse effects.

National recommendations for preconception care: The essential role of the family physician

Table 6.1: Summary of 10 key recommendations to improve preconception health by the Centre for Disease Control (USA)

1	Individual responsibility across the life span: Encourage each woman and every couple to have a reproductive life plan.
2	Consumer awareness: Increase public awareness of the importance of preconception health behaviours and increase individuals' use of PCC services using information and tools appropriate across varying age, literacy, health literacy, and cultural/linguistic contexts.
3	Preventive visits: As a part of primary care visits, provide risk assessment and counselling (education and health promotion) to all women of childbearing age to reduce risks related to the outcomes of pregnancy.
4	Interventions for identified risks: Increase the proportion of women who receive interventions as follow up to preconception risk screening, focusing on high priority interventions (i.e., those with high population impact and sufficient evidence of effectiveness).
5	Interconception care: Use the interconception period to provide intensive interventions to women who have had a prior pregnancy ending in adverse outcome (eg, infant death, low birth weight, or preterm birth).
6	Pre-pregnancy check-ups: Offer, as a component of maternity care, one pre-pregnancy visit for couples planning pregnancy.
7	Health coverage for low-income women: Increase Medicaid coverage among low-income women to improve access to preventive women's health, preconception, and interconception care.
8	Public health programs and strategies: Infuse and integrate components of preconception health into existing local public health and related programs, including emphasis on those with prior adverse outcomes.
9	Research: Augment research knowledge related to preconception health.
10	Monitoring improvements: Maximise public health surveillance and related research mechanisms to monitor preconception health.

Table 6.2: General recommendations for preconception interventions for women

	Questions/care considerations
Reproductive planning	Discuss reproductive goals and issues at each visit.
	When pregnancy is desired, discuss medications, health conditions, and activities that may affect fertility.
Folic acid	All women of reproductive age should be advised to take folic acid and to consume a balanced, healthy diet of folate-rich foods. Women at high risk for NTDs should take higher levels of folic acid.
Contraception	When pregnancy is not desired, discuss safe sex and effective contraceptive methods.
	Offer a full range of contraceptive methods and provide appropriate contraceptive counselling that is tailored to each patient's preference.
	Counsel women on the importance of birth spacing.
Family and genetic history	Assess pregnancy risks based on maternal age, maternal and paternal health, obstetric history, and family history.
Weight	All women with a BMI greater than or equal to 30 kg/m^2 or less than 18.5 kg/m^2 should be counselled about infertility risk and risks during and after pregnancy.
chronic disease management	Hypertension: Women of reproductive age should have blood pressure checks during routine care. If diagnosed with hypertension, they should be counselled on lifestyle changes and medications that are safe in pregnancy.
	Diabetes: Women who have diabetes should be counselled about the importance of glycaemic control.
	Depression/Anxiety Disorders: Women of reproductive age should be screened for depression and anxiety disorders and counselled about potential risks of untreated illness. Medications should be prescribed/adjusted prior to conception, if appropriate. Assess for use of teratogenic medications and optimise risk profile of medications.

	Questions/care considerations
Social and behavioural history	Assess social history, lifestyle, and behavioural issues that may affect pregnancy.
	All women of childbearing age should be screened for alcohol consumption, tobacco use, and drug use.
Immunisations	Immunisation status should be reviewed annually and updated as indicated.
STIs	For all women of childbearing age and their partners, assess STI risk, provide counselling and immunisations as indicated to prevent acquisition of STIs, and provide indicated STI testing and treatment.
Physical/sexual/emotional abuse	All women of reproductive age should be screened for current, recent past, or childhood physical, sexual, or emotional interpersonal violence, and referred to appropriate resources when needed.

BMI = Body mass index; NTDs = Neural tube defects; STI = Sexually transmitted infection

Table 6.3 General recommendations for preconception interventions for men by the Centre for Disease Contol (USA)

	Questions/care considerations
Reproductive planning	Male reproductive health issues should be an integral part of every wellness visit.
	Assess the man's understanding of reproduction and his reproductive plan.
	When a partner's pregnancy is desired, discuss medications, conditions, and activities that may affect fertility
	Conduct a physical examination looking for signs or conditions that may affect fertility.
Contraception	When a partner's pregnancy is not desired, discuss effective contraceptive methods.
Family and genetic history	Assess family history and genetic susceptibility.

	Questions/care considerations
Social and behavioural history	Assess social history, lifestyle risk factors (including smoking, substance abuse, and unsafe sex), and behavioural issues.
	Assess for occupational hazards that may affect fertility.
STIs	Assess STI risk, provide counselling, and immunisations as indicated to prevent acquisition of STIs, and provide STI testing and treatment.
Physical/sexual/emotional abuse	Beginning in adolescence, consider screening for and counselling to avoid intimate partner violence and coercive relationships and promote respectful and consensual sexual relationships.

STI = Sexually transmitted infection

The above guidelines from CDC USA were used to develop guidelines for PCC in Malawian context. Some of the recommendation in the above are not realistic in Malawian context hence the importance of having a study to determine the information and care on PCC according to Malawian population. The recommendation were adapted to develop strategies on PCC according to Malawian scenario.

6.2.5 Risk assessment before conception

Most men and women of childbearing age are challenged with various conditions affecting pregnancy like medical diseases, surgical conditions gynaecological problems, and infections and the problem related with nutrition. These conditions need to be assessed before attempting to get pregnancy. The study conducted in Blantyre urban indicated that 30% of respondents had anaemia, hypertension and respiratory problems. PCC requires collaboration of health care providers so that it can assess problems, manage and refer to specialists if necessary (Poels, Koster, Franx & Van Stel 2017:5). The role of different cadres of health care providers in providing PCC is to provide the service or identify a problem and refer. Anderson, Ebrahim, Floyd and Atrash (2006:106) highlight that as clients come to contact with the health care provider, it is an opportunity to administer PCC.A study done in Ethiopia indicated that only 27% of the respondents had knowledge on preconception care (Ayalew, Mulat, Dile & Simegn 2017:2).

6.2.5.1 Assessment and treatment of chronic conditions

It should be a routine to assess the women's height, weight, blood pressure measurement, clinical breast examination, Pap smear and bimanual pelvic examination every 1 to 3 years (Lu et al 2006:113). The routine assessment should not only be conducted during illness but also in a healthy person. The main goal of PCC is to identify medical and social conditions that may put the mother and the foetus at risk (Frey & Files 2006:1). A thorough assessment should be conducted to men and women of childbearing age to identify risks that could cause complications after conception. Lassi et al (2014:1) state that all chronic diseases like diabetes and hypertension should be controlled before conception. In the research study conducted, more than 90% of the respondents were not assessed on diabetes despite being a rising condition in the developing countries. Moreover, Lu et al (2006:116) maintain that gestational diabetes has increased the risk of macrosomia, birth trauma, newborn hypoglycaemia, and hyperbilirubinemia. During pregnancy, women can develop a dysglycemic state known as gestational diabetes which has an impact to the off spring (Swaleh, Zeng, Mbuagbaw & Morrison 2015:4). Diabetes control before pregnancy is a significant intervention that reduces the occurrence of congenital malformations by 70% (Lassi et al 2014:1). All patients that are diagnosed with diabetes need glycaemic control through self-assessment skills, physician directed assessment, care of disease and complications, counselling about diet, exercise, and reproductive advice before conception (Lassi et al 2014:2). Godfrey, Cutfield, Chan, Baker, Chong (2017:9) conclude that there are consequent benefits for the infant and the mother if maternal nutrition and glycaemic control is instituted before and during pregnancy. Optimising preconception nutrition is significant to avoid major risks like macrosomia (Godfrey et al 2017:9).

Assessments conducted by health care providers will assist to provide the health care and education on specific need of the individual or a couple. Yang, Wroth, Parham, Strait, and Semmes (2013:73) argue that personalised health planning should integrate health coaching which is a strategic intervention that applies a holistic and individualised approach to optimise physical, mental and social health. More importantly, PCC should be well outlined using brochures, handouts and waiting room posters to remind patients the significance of PCC and consultations. Michel and Charron-Prochownik (2006:110) reported that some health care providers have no training on provision of PCC and would benefit if guideline are available to assist them provide care. The messages should

include medical risk assessment, nutrition care and psychosocial assessments. Health care providers are the preferred source to provide preconception health information and treat diseases that would have adverse effects during pregnancy (Smedley, Jancey, Dhaliwal, Zhao, Montero & Howat 2013:10).

Health care information that is provided late during the antenatal period should be given early before pregnancy for patients to maintain the health practises during pregnancy. Smedley et al (2013:31) highlight the importance of having a healthier diet, physical activity and weight management that should commence before pregnancy. Health promotion messages and interventions should be started right away during pre-pregnancy period. Yang et al (2013:76) report on studies that indicate the use of physical activity which is associated with decreased risk for cardiovascular disease and type 2 diabetes. Freda et al (2006:46) highlight that health care contacts are important opportunities where patients can access preconception health habits and advantages of planned pregnancies. Men and women of childbearing age should be assessed for any risks that would affect them when pregnancy is anticipated. PCC weight management programme should be initiated in health facilities for clients to access (Harden, Ramalingam, Wilson and Evans-Hoeker (2017:12).

Intervention/strategy: **SREENING FOR CHRONIC DISEASES IN WOMEN OF CHILDBEARING AGE**

- Screening from hypertension and appropriate counselling and management should be done.
- Women diagnosed of diabetes should be counselled on maintaining appropriate glycaemic control before pregnancy.
- Screening from depression/anxiety disorders should be done with appropriate counselling and management.

6.2.5.2 Assessment and maintenance of nutrition

Good maternal nutrition plays an important role in promoting health of the mother and the baby (Lu 2006:111). Mothers need to be assessed for low or high body mass index, anaemia, and under-nutrition. Some of the contributing factors of under-nutrition that is common in Malawi are poor dietary patterns, lack of balanced food, eating disorders and

lack of supply of multivitamins and folate supplementation. Folic acid 400 mg is a standard preconception recommendation to prevent neural tube defect and iron 12 mg is routinely prescribed and taken before and after pregnancy (Godfrey et al 2017:9). Anon (2017:1) said that preconception counceling assist women of the reproductive age to use folic acid before pregnancy to reduce risks of NTDs. In Malawi, folic acid supplementation has not been started despite the recommendations that neural tube defects are controlled. Yakoob (2009:22) indicates that women taking folic acid supplementation periconceptionally before pregnancy and first two months of pregnancy are less likely to give birth to babies with neural tube defects. It is one of the interventions that should be instituted in under-five clinics, family planning clinics, STI clinics, and wellness clinics to target women of childbearing age that are planning to get pregnant. Newly married couples that have been screened form other ailments that could affect pregnancy and are planning to get pregnant should start taking folic acid supplementation. Green-Raleigh, Carter, Mulinare, Prue and Petrini (2006:177) reported that intake of folic acid before conception reduces NTDs occurrence by 50-70%. Nilsen, Leoncini, Gastaldi, Allegri, Agostino, Faravelli, Ferrazzoli, Finale, Ghirri, Scarano and Mastroiacovo (2016:1) reported that even in Italy women that take folic acid during preconception period still remains low despite interventions to use it to prevent complications of neonates at birth. Mountainous of optimal nutrition health should be done before conception by ensuring that adequate diet is provided, having healthy eating habits and appropriate assessments for ailments that could alter nutrition before pregnancy. Yakoob et al (2009:22) highlights that nutritional deficiencies are common during pregnancy particularly in low-and middle-income countries where diets of pregnant women are often less nutrient.

Every woman of childbearing age should have an appropriate body-mass index and interventions should be instituted to have a considerable weight before pregnancy. Mumford et al (2014:2) reported that some of the solutions to improve health outcomes during the preconception period is through use of multivitamin, control of weight and practicing health life style. Inadequate dietary intake before and during pregnancy may pose foetal risks and could be prevented by giving iron-folate supplements. Anaemia is one of the common problems of pregnant mothers in Malawi and it is advisable to administer 60 mg to 300 mg of iron, which make good outcomes of pregnancy.

Vinturanche, Moledina, McDonald, Slater and Tough (2014:1) argue that women intending to get pregnancy need to have optimal weight to have good pregnancy

outcome. This is because growing evidence suggests that maternal overweight and obesity is associated with poor maternal and prenatal outcome. Yekta, Ayatollahi, Porali, and Farzin (2006:4) indicate that pre-pregnancy BMI should be <19 and abnormal weight gain during pregnancy was found to be associated with neonatal birth weight defined as <2500g. Abnormal maternal weight gain is highly associated with low birth weight. Some of the complications of obesity are having big babies that end up being too big to be delivered vaginally and increase the risk of caesarean section. Weight control can be achieved by reducing calorie intake, total fat, saturated fat and cholesterol intake for one anticipating to get pregnant to have a normal BMI before pregnancy. Hui, Back, Ludwig, Gardiner, Sevenhuysen, Dean, Sellers, McGavock, Morris, Jiang and Shen (2014:8) state that healthy food intake and physical activity may contribute to the weight gain control for one to have a normal BMI before pregnancy. Masho, Bassyouni and Cha (2016:10) conclude that preconception counselling may be an opportunity to discuss healthy eating and benefits of daily multivitamin intake before pregnancy. Caesarean sections, low birth weight, longer hospital stays were associated with women who were obese prior pregnancy. Pre-pregnancy obesity is associated with greater risk of pregnancy complication (Mamun, Callaway, O'Callaghan, Williams, Najman, Alati, Clavarino & Lawlor 2011:1). Pre-pregnancy health care information should include weight control and weight gain before pregnancy.

Intervention/strategy: NUTRITION DURING PRECONCETION PERIOD

- All women with a BMI greater than or equal to 30 kg/m^2 or less than 18.5 kg/m^2 should be counselled about infertility risk and risks during and after pregnancy.
- All women of reproductive age should be advised to take folic acid and to consume a balanced, healthy diet of folate-rich foods. Women at high risk for NTDs should take higher levels of folic acid.
- Laboratory tests results for haemoglobin content, blood group and malaria parasites tests should be conducted before pregnancy.

6.2.5.3 Assessment and treatment of infections in pre-pregnancy period

Prevention and treatment of infections is also vital before pregnancy to have a healthy baby. Lassi et al (2014: 1) assert that STIs, systemic infections and periodontal diseases can impact the reproductive health of the mother and influence the outcome of the mother

and the baby during pregnancy. STI management with antibiotics significantly assist to control the prevalent rates of syphilis (Lassi et al 2014:3). Gonorrhoea and chlamydia infections if not treated before pregnancy are associated with causing choriomnitis, premature rupture of membranes, preterm labour and conjunctivitis to the newborn. All STIs should be timely detected and treatment should be provided during the preconception period to achieve optimal health of the mother and the baby after birth. Lassi et al (2014:1) indicate that Syphilis infection among pregnant women cause two million infections and contribute to congenital syphilis, stillbirths, premature births, neonatal death, developmental delay, blindness, deafness, and seizures. An assessment of infections and treating them before pregnancy is one of the interventions to provide PCC. Guidelines should be put in place to direct health care providers to conduct assessment and treatment of infections (Mazza et al 2013:1). For couples to have health outcomes of pregnancy, they need proper consultations and assessments that can rule out any infections that would occur. A study conducted by Lassi et al (2014:1) report that preconception behaviour interventions significantly decline reinfection or new STI rates by 55%. VDRL test is done routinely in Malawi during the antenatal period to identify and treat infections to minimise the transmission of the infections to the baby. In the study, only 31.1% of the respondents did VDRL test. Those who had messages to have laboratory tests done on haemoglobin content, HB, STIs, blood group and HIV/AIDS test were 52.6%. Men and women have some knowledge to have laboratory tests but services are not available in the facility for those that are not pregnant. Refer (table 6.3) that highlights the importance of men being tested for STIs.

Condom use is one of the interventions to prevent HIV infection (Lassi et al 2014:1). In the study, only 24.5% used condom despite some being HIV positive couples. Malawi has adopted an option B+ whereby all pregnant women and breast-feeding mothers are put on ART therapy for life (Malawi Government 2015-16:3). The chance to get tested is routinely done to pregnant mothers and their spouses. In the study, 89.7% of the respondents had their HIV status known owing to the routine test that is done late in pregnancy. It would be recommended to have HIV test before pregnancy to start ART early and minimise chances of transmitting HIV to the baby if pregnant. Lassi et al (2014:5) assert that ART for people who are HIV positive has consistently shown lower incidence rates of HIV not just on sero discordant couples but even to the entire population. There is evidence that HIV/AIDS education, condom promotion, peer

education, counselling and testing decrease risky sexual behaviour. All these interventions should be done during the preconception period.

The primary objective of risk assessment is to identify ongoing problems that need to be assessed and managed (Lu et al 2006:109). Chronic untreated infections such as periodontal disease could pose a threat not only to the next pregnancy, but to the mother's entire health. One of the interventions to decrease incidence of stillbirths is by assessing all the risk factors that could contribute to the stillbirth (Haws, Yakoob, Soomro, Menezes, Darmstadt & Bhutta 2009:3). Risk assessment, screening and treatment of specific infection should be conducted on men and women of reproductive health during PCC to prevent neonatal infections. A study conducted in Mozambique report that maternal mortality review showed that HIV infection, malaria and anaemia was found in 40% of the maternal death review (Haws et al 2009:3).

6.2.5.4 Vaccination

Preconception vaccination against tetanus prevents a significant number of neonatal deaths (Lassi et al 2014:1). Tetanus toxoid vaccine is provided to women during pregnancy in Malawi and in the study, 56.6% were provided with the vaccine. It would be important to provide awareness to all women of childbearing age to get a complete scheduled dose of tetanus toxoid before getting pregnant (Lassi et al 2014:5). Girls should be vaccinated for cervical cancer against Human Papilloma's Virus (HPV) to protect them before they are sexually active.The caution should be done not to provide cerviariarix within three-month preconception period as it can cause miscarriage (Lassi et al 2014:9).

Intervention/strategy: PREVENTION AND TREATMENT OF INFECTIONS

- For all women of childbearing age and their partners, assess STI risk, provide counselling and immunisations as indicated to prevent acquisition of STIs, and provide indicated STI testing and treatment.
- Provider Initiated Counceling and Testing(PICT) and Voluntary Testing and councelling (VCT) for HIV/AIDS, initiate ART for PMTCT to have a healthy mother and baby
- Screening and treatment of other infection like periodontal diseases that affect pregnancy
- Immunization status for tetanus, cervical cancer and pneumonia should be reviewed annually and updated as indicated.

6.2.6 Assessment for family and genetic counselling, social and behavioural history

6.2.6.1 Genetic screening and counselling

The findings of this study indicate that most (64.2%) respondents had no opportunity to be counselled on genetic issues. It is vital that patients have family history and medical record to identify risk factors that could help them to make informed decisions before conception on risk factors that could affect their offspring as some disorders can pass to the baby if both mother and father pass along the gene. Genetic tests before conception would be conducted on parents that have risk factors and tests could reveal the presence, absence or malformations of genes or chromosomes. Gal et al (2016:1) explain that preconception screening aims at detecting couples at risk for transmitting hereditary genetic diseases to their offsprings so that parents can make informed decisions regarding the reproductive options or the use of early interventions when available.

If patients are able to access carrier-screening programmes, it would reduce the incidence of genetic diseases and it is cost-effective from medical expenditure aspect (Gal et al 2016:1). Genetic screening conducted on men and women of childbearing age identify carriers of autosomal recessive diseases and should be done as a routine prenatal care. CDC recommendations stipulate that couples should be assessed on their family history and genetic susceptibility to rule out any risks that could affect pregnancy. Bonte, Pennings and Sterckx (2014:8) stated that genetic counselling should be done for potential parents to know that they are potential carrriers of genetic factors that have adverse effects on pregnancy outcome that could be prevented. If genetic screening is done before pregnancy, it could provide couples with more reproductive option like refraining from having children, prenatal diagnosis and preimplantation genetic diagnosis (Holtkamp, Vos, Rigter, Lakeman, Henneman & Cornel 2017:1). Genetic screening could target high-risk groups to identify if parents are carriers of the same autosomal recessive disorders and face a 1- in 4 risks of having affected child in each pregnancy. There are challenges that hinder the implementation of carrier screening like lack of organisational structures and uncertainty of offering the services. Involved stakeholders should be able to find strategies to implement genetic screening that is a vital to preconception service to men and women of childbearing age (Holtkamp et al 2017:12).

6.2.6.2 Social and behavioural history

The respondents in the study indicated that 90.1% of the respondents do not take alcohol, but 4.6% took a little, 3.6% took moderate alcohol and 1.7% took too much alcohol. However, since this information was subjective, some who take alcohol did not disclose that they are alcoholics. This information indicates that there is alcohol consumption in men and women of childbearing age. A study by Mellingen, Torsheim and Thuen (2013:1) indicates that both men and women of childbearing age reduced alcohol use significantly during pregnancy. The initiative to reduce alcohol during pregnancy is good but information should be provided to couples to reduce alcohol use during PCC. Midwives should provide information and identify risk patients that could use alcohol but there are challenges as some midwives are afraid of rebelling patients with a negative social behaviour (Payne, Watkins, Jones, Reibel, Mutch, Wilkins, Whitlock & Bower 2014:2). Married couples had lower level of alcohol use than patients that were cohabiting (Mellingen et al 2013:6). Patients with higher education showed association with higher pre-pregnancy drinking frequency but lower number of units per drinking occasion. In the study, the educational levels of patients had significance of association with preconception knowledge with X^2=28.75, p0.001.

There is significant increase in risk of stillbirth among pregnant women that are exposed to smoke (Yakoob et al 2009:8). In the study, 96% of the respondents indicated that they do not use any tobacco but 2.3% used cigarettes. The results show that some men and women of childbearing age are smoking. In Malawi, there are no rules or places for smoking indicating that people smoke publicly and more passive smoking is prevalent that could affect mothers with their developing foetus. Yakoob et al (2009:8) cautions that smoking is one of few potentially preventable factors associated with a number of poor pregnancy outcomes like low birth weight, preterm birth, stillbirth, and neonatal death. There is evidence that heavy smoking raises the risk of intrapartum stillbirth by 70% compared to non-smokers (Yakoob et al 2009:12). Tobacco use has adverse effects to pregnancy. Moreover, smokeless tobacco use is also detrimental as it may cause perinatal outcomes like stillbirths (Yakoob et al 2009:12). Furthermore, Haskins, Bertone-Johnson, Pekow, Carbone, Fortner and Chasan-Taber (2010:1) highlight that smoking is associated with increase of insulin resistance type 2 diabetes in non-pregnant women and this could affect the foetus when one has conceived. Smoking increase circulating

levels of catecholamine compounds involved in insulin resistance and nicotine has direct toxic effects on pancreatic cell function. More importantly, few men and women engage in smoking. It is encouraging that 96% of the respondents in the study indicated that they do not use tobacco. Health promotion messages should include the dangers of smoking to pregnancy and passive smoking that can be inhaled from the spouse or public places like shopping malls, market places, buses and recreational places.

Bortolus, Oprandi, Morassutti, Marchetto, Filippini, Agricola, Tozzi, Castellani, Lalatta, Rusticali,and Mastroiacovo (2017:9) showed evidence that most women stopped smoking as soon as they are aware that are pregnant. Though few women engage in smoking or taking alcohol, there is nevertheless a need to impart knowledge to them on effects of alcohol and smoking tobacco during pregnancy. Alcohol intake during pregnancy regardless of amount has effects on foetal and infant development.

Intervention/strategy: SOCIAL AND BEHAVIOUR COUNSELLING AND FAMILY HISTORY AND GENETIC SCREENING

- Assess family history and genetic susceptibility by checking basis of maternal age, maternal and paternal health, obstetric history, and family history before pregnancy.
- Assess social history, lifestyle risk factors (including smoking, substance abuse, and unsafe sex), and behavioral issues that would have adverse effects on pregnancy.

6.2.7 Screening for environmental hazards

Both paternal and maternal exposure has effects on the outcome of pregnancy if exposed to chemicals. In this study, most respondents' homes are away from factories that could cause air pollution and produce certain chemicals that could have adverse effects to pregnancy. Agricola, Gesualdo, Carloni, D'Ambrosio, Russo, Campagna, Pandolfi and Tozzi (2016:1) highlights that the prevalence of risk factors should include assessment of the couple to identify factors that would affect pregnancy. Some of the chemical exposures that would affect adverse effects of pregnancy are substances like lead, organic solvents, pollutants, exhaust fumes, and pesticides that could affect pregnancy outcomes to have low birth weight and increased risk of malformations. Exposure to these chemicals during the preconception period can lead to childhood cancers, neural tube defects, spontaneous abortions, and congenital malformations (Agricola et al 2016:3;

Kumar 2011:1). There is evidence that maternal exposure to air pollution before pregnancy predisposes offsprings to risk of having respiratory problems and allegies (Baïz, Slama, Béné, Charles, Kolopp-Sarda, Magnan, Thiebaugeorges, Faure & Annesi-Maesano 2011:1).

Some of the chemicals that have adverse effects on pregnancy are organochlorine chemicals such as dichlorodiphenly trichloro ethane (DDT), metals such as lead, mercury, industrial pollutants such as dioxin, organic solvents, and radiations. Respondents that had contact with chemicals in the study were 11.3% and being some in the rural Blantyre Clinic are subsistence farmers that could be highly affected by pesticides and fertilizer chemicals as 19.3% of the respondents were farmers. However, pesticides and herbicides are commonly used as new methods of farming are improving in Malawi. Maternal exposure to organic solvents in a study by Kumar (2011:919) indicates that there is association with spontaneous abortion and congenital malformations.

Some of the guidelines that would assist health care providers to provide PCC is assessing any exposure to environmental hazards at their homes and workplaces, provide counselling during PCC of avoiding use of unnecessary pesticides and herbicides, and find alternatives to some methods, which could be less hazardous (Mason et al 2014:5). One of the activities that would expose the men and women to excessive smoke in Malawi is use of open fires as most families cook on open fire. Lassi et al (2014:9) report that women that use wood, coal or tires for cooking which is so common in Malawi has twice chance of having a child with anencephaly compared to women not using this kind of energy. Innovations should be introduced in Malawi to have alternatives cooking sources of energy like use of stoves, gas and electricity. Moreover, Lassi et al (2014:3) highlight that health providers should identify substance abuse and environmental history during preconception period to provide an opportunity to assist men and women of childbearing age to reduce major health risks and identify key determinants to have a healthy pregnancy. Exposure to gas emissions from use of old cars that do not have complete combustions also poses risk factors during the preconception period (Lassi et al 2014: 9). There is high risk of children having cancers early in childhood because of mothers being exposed to radiation. X-rays are associated with higher adverse foetal and neonatal adverse outcomes even before conception (Lassi et al 2014:7). It is important to take precautionary measures to avoid unnecessary exposure to x-rays during the preconception period. Maternal exposure to radiation is associated

with abortions and childhood cancers while paternal exposure to x-rays also increase cases of childhood cancers.

Hjortebjerg, Andersen, Garne, Raaschou-Nielsen and Sørensen (2012:1) highlighted that though the majority cause of congenital abornormalities is unknown but occupational and environmental agents are suspected to be involved. Another concern that would expose men and women to chemicals is the use of personal products. Chan, Chalupka and Barrett (2015:2) highlight that some of the personal products that men and women of childbearing age use every day pose a danger during preconception period such as shampoo, toothpaste, deodorants, hair conditioners, and lotion. Excessive exposure to a variety of chemicals poses a risk to the developing foetus as 90% to 100% of pregnant women are exposed to many personal products that could be so risky to the developing foetus. Health information should be provided for men and women to use products that are safe to the reproductive health. Lassi et al (2014:9) illustrate that 3% of the foetal development defects are attributable to chemical exposure that influence the neonatal outcome like low birth weight, spontaneous abortion, preterm birth, stillbirth, congenital anomalies, developmental delays, and childhood cancers.

Intervention/strategy: PREVENTION AND SCREENING OF EXPOSURE TO ENVIRONMENTAL HAZARDS

- Assess for vulnerability to environmental hazards like exposure to air pollution, chemicals and excessive smoke that would affect reproductive health.
- Assess for occupational hazards and conditions that may affect fertility.

6.2.8 Use of medications before and during pregnancy that could have effects on the foetus

The other intervention of PCC that need to be provided to men and women of childbearing age is assessment of women of childbearing if they have exposure to medications and chemicals that would cause teratogenic effects to the babies. Mosha, Mazuguzi, Mrema, Abdulla and Geston (2014:1) highlight the importance of educating the community on drug safety information that women of childbearing age should avoid over the counter medications that would lead to some teratogenic effects to pregnancy. Respondents in

the study showed that only 24.2% knew the adverse effects of utilising some drugs that could harm the foetus at conception and during pregnancy. Assessment of patients before conception would prevent some adverse effects. Gadzhanova and Roughead (2015:11) found that epileptic patients on carbamazepine would make the foetus to have increased risk for major congenital malformations including neural tube defects.

It is important to empower patients during preconception period to have knowledge on medication that would lead to adverse effects during pregnancy. Some antiretroviral drugs like those that have a combination of efavirenz have a negative effect on the foetus (Chersich, Urban, Venter, Wessels, Krause, Gray, Luchters & Viljoen 2006:1). In Malawi, most women who are HIV/AIDS positive are commenced on antiretroviral drugs and precautions should be done to screen the mothers that could be at risk of having adverse effects on the foetus. Those women that plan to conceive that are on efavirenz should be considered for substitution or temporarily suspending the treatment. Proper counselling of HIV/AIDS patients on treatment should be appropriately assessed to rule out teratogenic effects. In a study conducted in Pakistan, there is evidence that 1% of pregnant women attending health care service were given teratogenic drugs prescription (Rohra, Das, Azam, Solanki, Memon, Shaikh & Khan 2008:4). Furthermore, Menezes, Yakoob, Soomro, Haws, Darmastadt and Bhutta (2009:1) argue that the cause of stillbirths could be minimised by appropriate assessment and treatment of medical conditions that affect pregnancy. Assessment and treatment during preconception period could reduce stillbirths. Some medical practitioners could prescribe drugs that could cause teratogenic effects and some drugs that were discovered that were associated with causing teratogenic effects were warfarin and retinoid (Gils, Pottegård, Ennis & Damkier 2016:1). Health care providers should be aware of the medications that would induce teratogenic effects to the foetus at conception and during pregnancy.

Intervention/strategy: PREVENTION OF DRUGS THAT WOULD HAVE TERATOGENIC EFFECTS DURING PRECONCEPTION PERIOD

- Collect relevant history from all women of childbearing age to identify any medications that would cause teratogenic effects.
- Prescribe medications that are safe during pregnancy by consulting the physician and educate men and women during preconception period to avoid over the counter drugs to prevent teratogenic effects.

6.2.9 Availability of preconception care information

There is a need to incorporate preconception messages in the curricula for primary, secondary and tertiary education as in the study those that had education were having preconception messages. Mummford et al (2014:1) illustrate that preconception time period is as important as pregnancy and post-pregnancy periods as it is also promoting the incorporation of adolescents in the continuum of care. Availability of information will assist patients to make appropriate choices that influence health outcomes of the mother and the baby. It is never too early to intervene during the preconception period to have healthy outcomes of pregnancy and it requires the effort of the multidisciplinary team to achieve accessibility of PCC (Mummford 2014:3). Exposure to information influences healthy seeking behaviours that will impact maternal and newborn outcomes. Lassi et al (2014:2) highlight the key preconception messages that include completion of secondary education for adolescent girls, counselling on family planning, optimisation and weight loss programmes, and multicomponent youth development programme including infection prevention. Some components that could be included are healthy eating, increasing exercise and reducing sedentary behaviour (Draper, Micklesfield, Kahn, Tollman, Pettifor, Dunger & Norris 2014:13). People at young age will have appropriate information that will influence their reproductive health choices in the future to prevent risks to maternal newborn health and practice health promotion messages that will influence good health.

PCC information should be accessible to key informants that have influence to the reproductive health like church counsellors for newlywed couples, women and men counsellors of girls and boys, and health care providers. The inclusion of male involvement in reproductive health issues like PCC is vital to optimise services aiming at improving birth outcomes as the paternal involvement is crucial to improve pregnancy outcome (Alio, Lewis, Scarborough, Harris & Fiscela 2013:1). Male counterparts should be informed about their role to healthy child development and to provide support to the mother to improve pregnancy outcome. Information should target all the people at different health continuum from adolescent to adulthood.

Advertising the availability of PCC should be a policy in the country to generate demand so that people should access PCC. The media like radio, television and social media

should provide required preconception messages that will promote health. Innovative methods for mass communication should be utilised to provide appropriate information to inspire people to use the health promotion strategies. Van Dijk, Oostingh, Koster, Willemsen, Laven and Steegers-Theunissen (2017:2) contributed that inorder to create awareness and to implement PCC at a large scale there is need to develop new approaches like technology. Billboard advertising, posters, road signs, flyers, and newspapers should provide preconception message to reach a lot of people.

Intervention/strategy: **IMPLEMENTATION OF PRECONCEPTION INFORMATION**

Incorporate preconception messages in schools primary, secondary and tertiary education for people to utilise the information in all the health continuum from adolescence to adulthood.

Communities to emphasize the provision of counselling, church counsellors on married couples, women and men counsellors for girls and boys should acquire the necessary information on preconception care.

Advertise preconception messages on the radio, television, health facility posters, billboards and road sign.

6.3 CONCLUSION

The study sought to identify the preconception information and care that the men and women of childbearing age receive and produced some guidelines. Some of the components of PCC are done haphazardly and clients do not really have the information on PCC apart from antenatal care that is provided universally in Malawi. Literature explored from various countries has provided information on what should be done to provide comprehensive PCC that would improve maternal and newborn outcome. PCC if provided to men and women according to the guidelines provided would improve the lives of families and communities in Malawi.

6.4 RELEVANT INTERVENTIONS TO PROVIDE PRECONCEPTION CARE THAT WOULD IMPROVE MATERNAL AND NEWBORN HEALTH IN BLANTYRE DISTRICT IN MALAWI

6.4.1 Introduction

This study was conducted in Blantyre Urban District. The findings of the study assisted to develop the guidelines on PCC that is relevant to the Malawi setting as needs were identified. Extensive literature review on PCC provided in other countries assisted to provide the appropriate interventions that would assist to improve maternal and newborn outcome. There is a need to have guidelines on PCC that will provide standardised PCC in health facilities in Malawi.

The draft interventions that were identified from the research study and extensive literature review were subjected to be reviewed by a group of stakeholders which were derived from Ministry of Health of Malawi, reproductive health service, education institutions, NGOs and health care provider's leaders like hospital matrons and District Health administrators. This group of health care providers assisted to scrutinise the developed interventions on PCC that would be feasible and relevant to Blantyre District in Malawian setting. The senior health professionals were to provide inputs on the interventions that would be applicable and feasible to Malawian setting.

PCC is any preventive, promotive or curative health intervention provided to women and men of childbearing age in the period before pregnancy or between consecutive pregnancies to improve health-related outcomes for women and children (Lassi et al 2014:2). Antenatal and postnatal care interventions are well stipulated in health care manuals but PCC is fragmented and needs to have stipulated guidelines in Malawi.

Mumford et al (2014:1) illustrate that preconception period is one of the crucial times that care should be provided to improve pregnancy outcomes as it is during pregnancy. There is a need to develop local, realistic and manageable interventions that can benefit both women and men throughout their lives regardless of their pregnancy interventions (Mumford et al 2014:3). Preconception period should offer an earlier opportunity to optimise the health of potential mothers and fathers and prevent harmful exposures affecting the developing foetus (Lassi et al 2014:1). Some of the components that should

include the package on PCC are birth spacing, prevention of teenage pregnancies, enhancing nutritional status, preventing and treating infections, screening and management of chronic diseases, reducing risky social behaviours, individual and environmental factors that could contribute to poor maternal child health outcomes. Bialystock, Poole and Greaves (2013:189) Cocluded that health promoters can play a crucial role to advocate for countries to adopt preconception interventions that would improve pregnancy outcomes.

Lassi et al (2014:9) highlight that PCC should include the whole health continuum like adolescents, men and women of childbearing age and all high-risk women. The guidelines to PCC has been developed using the centre for disease control and prevention to improve preconception health and health care (Squiers, Mitchell, Levis, Lynch, Dolina, Margolis, Scales & Kish-Doto 2013:1).

6.4.2 Process of guidelines development

The stakeholders were involved to ensure that the preconception guidelines that have been developed from the findings of this study and literature reviewed are applicable to Malawian setting. The article on framework for endorsement of national clinical guidelines by Armstrong, Rueda, Gronseth and Mullins (2017:4) provided a framework that is used to develop guidelines. Refer figure 6.2 below.

Table 1 Patient engagement requirements/recommendations from select groups describing standards for guideline development

Group	Recommended patient engagement approach
AGREE II[1]	'5. The views and preferences of the target population (patients, public, etc.) have been sought' (part of Domain 2. Stakeholder Involvement)
G-I-N International Standards[3]	'A guideline development panel should include diverse and relevant stakeholders, such as health professionals, methodologists, experts on a topic and patients or other healthcare consumers'
IOM[5]	Standard 3.1: 'The GDG should be multidisciplinary and balanced, comprising a variety of methodological experts and clinicians, and populations expected to be affected by the CPG.'
	Standard 3.2: 'Patient and public involvement should be facilitated by including (at least at the time of clinical question formulation and draft CPG review) a current or former patient and a patient advocate or patient/consumer organization representative in the GDG'.
	Standard 3.3: 'Strategies to increase effective participation of patient and consumer representatives, including training in appraisal of evidence, should be adopted by GDGs'.
	Standard 7.1: 'External reviewers should comprise a full spectrum of relevant stakeholders, including scientific and clinical experts, organizations (e.g. health care, specialty societies), agencies (e.g. federal government), patients and representatives of the public'.
	Standard 7.4: 'A draft of the CPG at the external review stage or immediately following it (i.e. prior to the final draft) should be made available to the general public for comment. Reasonable notice of impending publication should be provided to interested public stakeholders'.

Figure 6.2: Framework for endorsement of clinical guidelines

(Armstrong, Rueda, Gronseth & Mullins 2017)

The guidelines developed were subjected to reviews by selected group of stakeholders like all relevant professional groups, health care professionals, hospital managers, and members of the public. The main aim of the review according to the framework on clinical guidelines was to assess the feasibility of implementing the guidelines in the Malawian setting. It is significant to have all barriers identified and modify the interventions that would be applicable Malawian clinical setting. The interventions on PCC should also be relevant to consumers and the findings from the research study highlighted the areas that patients needed. The guidelines on PCC need to be clear and acceptable to all the stakeholders. Avortri (2015:335) outlined a framework for development of client centred

guidelines which has been adopted in this study to develop the guidelines on PCC. Refer figure 6.3 below.

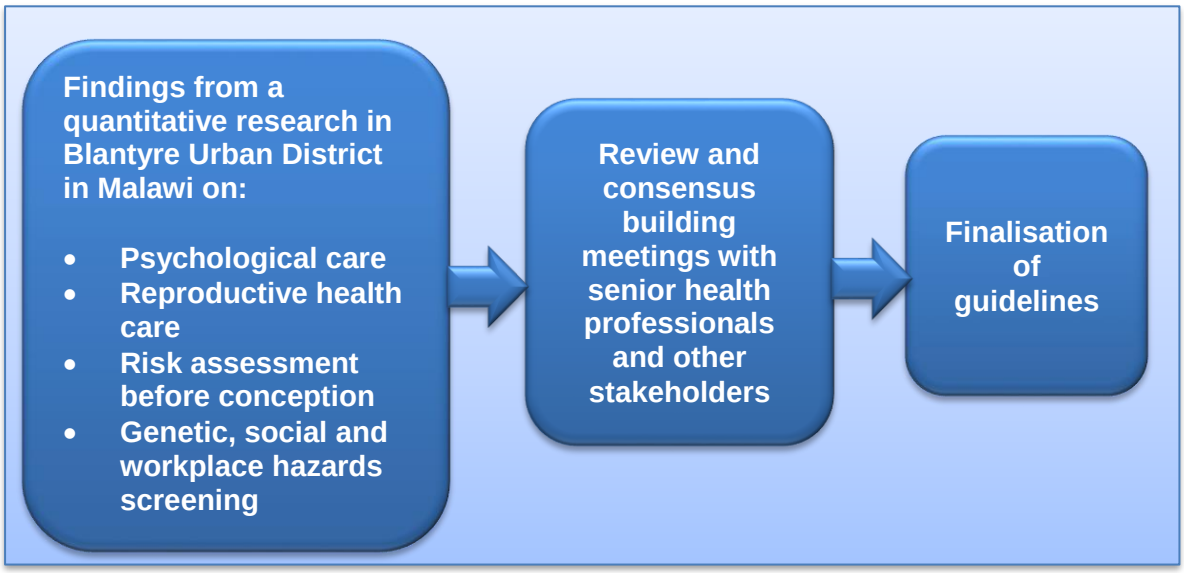


Figure 6.3: Framework on development of strategies on PCC

Through this study, it was found that though neglected and not given appropriate attention, preconception health care would assist to improve maternal and newborn care. The quantitative study conducted in Blantyre Urban City provided the components that should be included in preconception health. Literature provided evidence that preconception health care reduces complications that would occur during pregnancy affecting the mother and the child. The three clinics surrounding Blantyre Urban District indicated different ways and content that was provided. Preconception guidelines will assist to provide standardised care and there will be uniformity in most of the health facilities on the care provided and the messages that patients should have. Health promotion messages would target the needs of the people.

6.4.3 Application of guidelines

The guideline developed will be used in the health facilities to provide uniformity and standardised PCC. The Health Education Unit of the Ministry of Health would have a source of relevant messages that would be provided to the people of Malawi to promote PCC in the country. All health care cadres would be provided with the appropriate care guidelines according to their scope of practice to promote relevant intervention on PCC.

6.4.4 Purpose of the guidelines

Standardised preconception guidelines that are relevant to the Malawian setting would be available for health promotion and to contribute to reduction of maternal and newborn care that is very high in the country.

6.4.5 Objectives of the guidelines

- Identify the recommended preconception guidelines that would be relevant to Malawian setting to reduce maternal and newborn health.
- Reinforce the use of preconception health care guidelines in all health care facilities in Malawi.

6.4.6 Components for preconception care

- Psychological care before conception.
- Reproductive health information.
- Risk assessment before conception.
- Genetic, social behaviours and work risks screening.

6.4.7 Comprehension and meaning of preconception care

The consensus from stakeholders at policy, administration and health care provision level conceptualised the importance of PCC that should be intergraded to provide comprehensive reproductive health care to all patients from adolescents to childbearing age. The Ministry of Health (2009:18) indicates that high fertility, postpartum infection, postpartum haemorrhage, pregnancy-induced hypertension, complications of abortion, obstructed labour, HIV and AIDS, and anaemia contribute to the increased maternal mortality rate in Malawi. More importantly, PCC that could be incorporated before antenatal care could contribute to reduction of maternal mortality rate in Malawi. The consensus among stakeholders in Malawi highlighted the integration of preconception counselling to any patients that come for health care services in the facilities. Information, education and communication should capture appropriate health messages that include messages on PCC.

6.5 SECTION 2: TECHNICAL GUIDELINES ON PRECONCEPTION HEALTH CARE

The section will highlight the technical guidelines related to provision of PCC in Malawian health facilities. Some components have been provided at some stage in the perinatal cycle but there has been lack of information to both men and women of childbearing age from 18 to 35 years of age, mostly the time before pregnancy from adolescent to the first pregnancy. Figure 1 indicates that there has to be the enabling environment for PCC to be incorporated at the underlying phase to have men and women that are empowered with appropriate education from adolescence period. Education was found to be an associating factor. Educated clients had some information on PCC and if services available could assist them to practice PCC.

6.5.1 Psychological care

The enabling environment present will assist men and women from adolescence to be empowered to seek PCC before and in between pregnancy. All women and men of reproductive age should be screened for current, recent, past, or childhood physical, sexual, or emotional abuse as well as interpersonal violence and be referred for appropriate care when needed. A healthy mind will promote healthy pregnancy and good outcome of the mother and the baby. During any visit by a couple to a wellness clinic when pregnancy is desired, they should ensure that they are psychologically prepared to take care of the pregnancy. Good psychological preparation prepares the couple to have a healthy mother and baby. If couples are healthy enough to carry the pregnancy and ready to support pregnancy, good outcome of pregnancy is anticipated. Each couple should have a well-detailed reproductive health plan that will assist proper development of the foetus.

Since wellness clinics are not yet available in Malawi, the recommendations are that health care providers should offer counselling to all patients that access health care services for various services like under-five clinic, family planning clinic, treatments of minor ailments and any encounter with the clients to assist couples and individuals plan their pregnancy.

6.5.2 Provision of preconception information:

Men and women from adolescence to childbearing age need awareness on family planning methods that would assist them to have a planned pregnancy at the right time. More importantly, there should be increase in public awareness on the importance of preconception health behaviours as well as increase individuals' use of PCC services. There is a need to prepare and use appropriate information and tools across varying age, literacy, health literacy, and cultural contexts. The Health Education Unit should have appropriate messages that would assist patients to have preconception messages through posters, billboards, radio, and television advertisements.

6.5.3 Healthy timing and spacing of pregnancy

Preconception messages should comprise of the following messages that would assist couples and individuals have a healthy outcome of pregnancy:

- Delay the first pregnancy by using FP method of choice before 18 years old and first birth before marriage for appropriate support from the spouse.
- Couples should continuously use an effective FP method of choice for two years before trying to get pregnant again after a live birth.
- Birth interval should not be more than five years as there are adverse effects to the mother and the baby if the birth interval is prolonged.
- After a miscarriage or induced abortion, the recommended minimum interval to next pregnancy is at least six months in order to reduce risks of adverse maternal and perinatal outcomes like abortion and premature births that are still high in Malawi.

School curriculum in primary and secondary education have included social studies and life skills that include the appropriate time to have pregnancy being after 18 years. One should wait to get pregnant until married and is of the appropriate childbearing age. The focus is on the girl child who is given incentives to remain in school until ready to care for herself and the child to be born. Despite the following empowering messages to the girl child teenage pregnancy is still high in Malawi and teenage fertility rate in rural areas is 31% and 21% in urban of Malawi (MDHS 2015-16:4). PCC messages will assist to motivate communities to reduce teenage pregnancies.

6.5.4 Nutrition and good health during preconception period

There should be appropriate health assessments to all girls and women in preparation for conception at a particular time. Girls and women with a BMI greater than or equal to 30 kg/m^2 or less than 18.5 kg/m^2 should be counselled on adverse effects like infertility, malnutrition, hypertension, and diabetes during and after pregnancy. A healthy nutritious diet should be provided to all girls and women to maintain a healthy body.

All women of reproductive age intending to get pregnant should be advised to take folic acid and to consume a balanced, healthy diet of folate-rich foods to reduce the risk of congenital birth defects such as neural tube defects. Through the reproductive health unit, Malawi should initiate the importance of taking folic acid six months prior to conception to reduce some congenital abnormalities. Laboratory tests to measure haemoglobin level, blood group, presence of malaria parasites HIV, and STI tests should be conducted as part of pre-pregnancy screening to ensure that a mother is in good health before conception.

6.5.5 Screening for chronic diseases in women and men of childbearing age

A recommendation should be made to have appropriate screening of chronic diseases for couples and individuals to have a healthy pregnancy outcome. Health care facilities should aim at providing services for the following assessments:

- Screening for hypertension and appropriate counselling to minimise risk of hypertension.
- Women diagnosed of diabetes should be counselled effectively to maintain appropriate glycaemic control before falling pregnant.
- Screening for depression and anxiety disorders should be done through appropriate counselling and management.

6.5.6 Early diagnosis and treatment of infections

Prevention of infections should be administered to all men and women of reproductive health age to minimise infections that would affect the development and growth of the foetus in the utero.

- For all women of childbearing age and their partners, assess sexually transmitted infection (STI) risk, provide counselling and treatment as indicated to prevent acquisition of STIs, Provider Initiated Counselling and Testing (PICT) and Voluntary Counselling and Testing (VCT) for HIV and AIDS, initiate ART for PMTCT to have a healthy mother and baby.
- Screening and treatment of other infections like bacterial vaginosis, yeast infections, group B strep and periodontal diseases that occur during pregnancy should be done to avoid adverse effects to unborn babies like hearing loss, visual impairment or blindness.
- Immunisation status for tetanus and cervical cancer should be reviewed annually and updated as indicated.

6.5.7 Screening and counselling on social behaviour, family history, and genetics

Appropriate screening should be conducted on the following factors to offer counselling that would affect the development and growth of the foetus:

- Assess family history and genetic susceptibility by checking basis of maternal age, maternal and paternal health, obstetric history, and family history before pregnancy.
- Counselling for elder women intending to get pregnancy for potential occurrence of Down's syndrome, genetic chromosome 21 disorder causing developmental and intellectual delays.
- Assess social history, lifestyle risk factors (Including smoking, substance abuse, alcohol abuse and unsafe sex), and behavioural issues that would have adverse effects on pregnancy.

- Assess susceptibility to genetic disorders such as sickle cell anaemia, albinism, and haemophilia by assessing family history, previous childbirths, and obstetric history before pregnancy.
- Provide genetic counselling where family history is positive for any potential inherited abnormality.

6.5.8 Prevention and screening of exposure to environmental hazards

All men and women of childbearing age should avoid environmental hazard that would have adverse effects on foetal development and growth by:

- Assessing for vulnerability to environmental hazards like exposure to chemicals and excessive smoke that would affect reproductive health. It is scientifically shown that long-term exposure to everyday environment pollutants may produce fertility hazards ranging from impaired egg production to recurrent miscarriage, sperm abnormalities and decreased sperm counts.
- Identify occupational hazards and conditions in the environment that may affect fertility like exposure to fertilizers, pesticides and herbicides that have effects on reproductive system.

6.5.9 Prevention of drugs use that would have teratogenic effects during preconception period

Inappropriate use of medications during pregnancy especially during conception has some adverse effects on development and growth of the foetus. Drugs use during preconception period should be restricted to doctor's prescription and the following should be provided to client's prior conception:

- Collect relevant history from all women of childbearing age to identify any medications that they have used and that would have teratogenic effects.
- Prescribe medications that are safe during pregnancy by consulting the physician and educate men and women during preconception period to avoid over the counter drugs to prevent occurrence of teratogenicity.

6.5.10 Implementation of preconception information

Availability of preconception information should be accessible to all populations doing the following:

- Incorporating preconception messages in school curriculum in primary, secondary and tertiary level education so that people can utilise the information across the health continuum from adolescence to adulthood.
- Communities to emphasise the provision of counselling, such as church counselling on married couples. Women and men counsellors for girls and boys should acquire the necessary information on PCC.
- Advertise preconception messages on the radio, television, health facility posters, billboards, and road sign to increase society awareness of the value of PCC. A study done in Ethiopia reported that women that had regular media exposure had higher desire for birth spacing compared to their counterparts (Haile, Gebremedhin, Berhane, Gebremedhin, Abraha, Berhe, Haile, Gigar and Girma, 2016:6).

6.6 CONCLUSION

The stipulated guidelines have been developed to guide health care providers on important areas that should be included when providing preconception health care in the health facilities. The extensive literature review, the research study done and reviews by implementers of reproductive health, policy makers and administrators provided the appropriate components that are relevant to provision of PCC. Steel et al (2015:2) indicates that PCC needs to be tailored to suit the needs of the consumers which are the men and women of childbearing age. Despite efforts to provide PCC in other developed countries, there are still significant research gaps that need to be addressed which one of them is having relevant and meaningful programmes on provision of preconception health. One of the recommendations on a study conducted in Malawi on HIV positive patients was the need to develop policy and guidelines for health care providers to serve patients that are intending to have children despite their positive status on HIV (Kawale, Mindry, Phoya, Jansen & Hoffman 2015:6). There is need in Malawian health setting to have relevant guidelines that would standardise the provision of PCC.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

The study sought to determine the care and information on PCC that men and women of childbearing age have during their reproductive period. The main aim was to develop the relevant strategies that could be used in the clinical facility to promote good health of the mother and the baby during and after pregnancy. Results obtained from this quantitative research, consensus from the stakeholders and literature review indicated the significance and need of preconception health care to all men and women of childbearing age. The importance of PCC is that it would contribute to reduction of maternal and newborn morbidity and mortality in Malawi that remain high in the 21st century.

Input from the consensus after stakeholder's review have been used to ensure that the PCC guidelines developed are feasible and applicable in the Malawian health care setting. The findings will be discussed in relation to the objectives of the research study, Health Promotion Model, limitations and recommendations, and suggestions for the future study.

7.2 RESEARCH DESIGN AND METHOD

The study used a quantitative exploratory cross sectional descriptive design to determine the use of PCC among men and women of childbearing age in Blantyre Urban District. Data collected through a questionnaire were measured using computation technique or numerical measurement. The researcher used a cross sectional study to measure what was being practised by men and women of childbearing age on PCC. Data were collected at a specific point in time to assess the practices done before pregnancy to ensure a healthy pregnancy. Relationships among variables were examined in a descriptive study as information was collected without changing the environment of respondents. Data from childbearing aged men and women were collected from two clinics in Blantyre Urban District and one from semi-urban clinic.

7.3 SUMMARY AND INTERPRETATION OF THE RESEARCH FINDINGS

The findings from the study indicated a great need for Malawi to provide PCC that was provided inconsistently and information to the clients was not adequate. Men and women of childbearing age did not know much on preparation to get pregnant, risk assessment to be done before conception, health care practices to promote a healthy mother and baby after conception. This study examined the information and care possessed by men and women of childbearing age had on PCC as some the components are provided in health facilities in a fragmented way. The main purpose of the study was to develop relevant preconception strategies that could be implemented universally for Malawian health facilities to provide standardised care uniformly. This is done to ensure people of the reproductive age have the appropriate comprehensive PCC that would contribute to reduction of maternal and newborn health. The findings, literature search and the input from the stakeholders produced valuable information that need to be used by families, community and health care facilities. In most of the components of care examined, results showed that there is a need to provide information to clients on PCC for them to implement. PCC should be provided in almost all health care facilities and there should be standardised guidelines to assist health care providers give care and advice.

The research was underpinned by Pender's Health Promotion Model (HPM). The study used the HPM to alert the people to actively regulate their own behaviour to improve their behaviour and lifestyles during the preparation to conception. Individuals and couples will be more proactive to seek risk screening to infection that have impact to pregnancy, will practise HTSP to prevent complications of pregnancy that occur when pregnancy come too soon and too late. The study will follow Pender's HPM to link the concept that PCC is an intervention that will promote health outcome of the mother and their newborn. Polit and Beck (2012:127) highlight that people will make a decision to comply with health behaviour like use of contraception, preventive health screening and take a good nutritious diet if they are able to perceive the desired outcome of the health behaviour benefit.

Strategies developed that could be provided to clients have been grouped as psychological preparation before conception, healthy timing and spacing of pregnancy, risk health assessment before conception, environmental and chemical exposure assessment and genetic counselling. Conclusions and recommendations are applicable

to Malawian health setting but have some limitations owing to lack of resources and high technology. However, some recommendations require minimal costs and are so ideal to a resource constraint country like Malawi. There is a need to have a start to provide standardised PCC in various clinical settings in Malawi.

7.3.1 Psychological preparation before conception

Reproductive health planning should be done before conception for the couple to emotionally adjust well to the needs of the pregnancy. Most causes of maternal morbidity could be eliminated by avoiding unintended pregnancy. Preconception health care should be provided to all members of the health continuum starting from adolescent period. All psychological elements that would affect pregnancy emotionally should be eliminated. These include depression, anxiety and physical abuse. Social support by a spouse is significant to improve maternal and neonatal outcome. Evidence from the literature indicated reduced incidence of preterm births and abortions if pregnancies are properly planned.

7.3.2 Reproductive health information

There is a need to reinforce that family planning service is one of the components of PCC. Malawi has incorporated the use of family planning services in the reproductive health policy. However, there could be comprehensive health care if PCC would be incorporated in the policy. Family planning services should be one of the services that is provided to ensure that individuals and couples have comprehensive reproductive health care. Lack of family planning services contribute to increase of unintended pregnancies that result in preterm births and subsequent abortions and rise in maternal mortality. There has to be availability of information on family planning services that will promote the implementation of PCC. The use of long-term family planning methods should increase to reduce incidences of unplanned pregnancies. There has to be awareness across the continuum from adolescence to adulthood to have reproductive health plan. Couples and individuals should have children by choice and not by chance because the latter increases many maternal and newborn adverse effects on pregnancy outcomes.

7.3.3 Healthy Timing and Spacing of Pregnancy (HTSP)

One of the components of PCC that would improve birth outcomes is practising appropriate HTSP. Appropriate messages should be provided to adolescents and childbearing age group to avoid unintended pregnancies and have pregnancy at the right time when minimal risks are anticipated. Teenage pregnancy and advanced maternal age have indicated to increase risk of adverse effects to pregnancy. Pregnancy should wait until one is 18 years old and not to have pregnancies beyond the age of 35. Causes of high maternal mortality rate could be minimised if PCC is provided to couples and individuals. Long and short birth intervals between pregnancies have indicated increased risks such as preterm births, low birth weight and small for gestation age babies. Information should be available to all people to wait for 18 to 24 months after pregnancy ending in a live birth, wait for six months after abortion before conception. HTSP messages should be provided to the people to ensure comprehensive PCC.

7.3.4 Risks assessment before conception

Health assessment is one of the components that should be considered before conception to treat and control some of the conditions that would affect pregnancy. Wellness clinics should be in place to provide an opportunity for every individual to have a health assessment before conception. Health promotion messages and interventions should be started right away during pre-pregnancy period to assist the people who are planning to be pregnant. Chronic conditions like hypertension, diabetes, depression, and anxiety disorders should be managed before conception to have a healthy outcome of the mother and the baby. Some factors during preconception period increase the risk of preterm birth (Belizán, Hofmeyr, Buekens & Salaria 2013:1). Awareness of risk assessment on various chronic illnesses and maintaining a healthy mental status will make all girls and women of childbearing age to seek health assessment before conception. Availability of relevant guidelines on PCC will ensure that health care providers control any diseases on patients before conception to have a healthy outcome.

7.3.5 Nutrition during preconception period

Women of childbearing age need to maintain optimum nutrition to support pregnancy by having a good weight preventing under-and over-weight gain that has some adverse

effects during conception. Any encounter with the patients at the health facility should have nutritional counselling that is significant to maintain a healthy diet. It is important that maintenance of good nutrition should start at a very early stage during adolescent period to ensure that good nutrition status is maintained as pregnancy is planned. Information, education and advice should be provided for all patients across the health continuum to adopt best practices and habits for them to have appropriate nutrition. In some times when there are food shortages, nutrition programmes should be under way to provide necessary dietary sources of food. Patients that seek to conceive should be commenced on folic acid supplements to prevent neural tube defects. Necessary tests should be conducted to rule out anemia and ailments that cause hemolysis of blood that should be treated before pregnancy.

7.3.6 Assessment and treatment of infections during the pre-pregnancy period

There should be prevention and treatment of infections from the couple to ensure protection of adverse effects on the foetus. All couples and individuals requiring to conceive need appropriate assessment on infections that affect the foetus like STIs, HIV and AIDS and periodontal diseases. More importantly, Provider Initiated Counselling and Testing (PICT) and Voluntary Testing and Counselling (VCT) for HIV/AIDS should be conducted to determine the status of the couple or individuals intending to conceive. Furthermore, ART for PMTCT shoud be initiated to have a healthy mother and baby. Screening and treatment of other infections like periodontal diseases that affect pregnancy should be conducted prior to conception. Immunisation status for tetanus and cervical cancer should be reviewed annually and updated as indicated.

7.3.7 Screening and counselling on genetics and social behaviour

Appropriate screening should be done on in order to offer counselling that would affect the development and growth of the foetus. Assess family history and genetic susceptibility by checking basis of maternal age, maternal and paternal health, obstetric history, and family history before pregnancy. Counselling for elderly women intending to get pregnant should be conducted before conception for potential occurrence of Down’s syndrome, genetic chromosome 21 disorder causing developmental and intellectual delays. Any susceptibility to genetic disorders such as sickle cell anaemia, albinism, and haemophilia should be ruled out by assessing family history, previous childbirths, and obstetric history

before pregnancy. Genetic counselling should be provided where family history is positive for any potential inherited abnormality. Assess social history, lifestyle risk factors (Including smoking, substance abuse, alcohol abuse and unsafe sex), and behavioural issues that would have adverse effects on pregnancy. Risks that would affect development and growth of the foetus in the utero would be ruled out before conception.

7.3.8 Prevention and screening of exposure to environmental hazards

Assessing for vulnerability to environmental hazards like exposure to chemicals and excessive smoke that would affect reproductive health should be conducted. It had been scientifically shown that long-term exposure to everyday environment pollutants may produce fertility hazards ranging from impaired egg production to recurrent miscarriage, sperm abnormalities and decreased sperm counts. Occupational hazards and conditions in the environment that may affect fertility like exposure to fertilizers, pesticides and herbicides that have effects on reproductive system should be identified.

7.3.9 Prevention of drugs use that would have teratogenic effects during preconception period

Inappropriate use of medications during pregnancy especially during conception has some adverse effects on development and growth of the foetus. Drugs use during preconception period should be restricted to doctor’s prescription. Relevant history from all women of childbearing age should be collected to identify any medications that they have used and that would have teratogenic effects. Moreover, it is essential to prescribe medications that are safe during pregnancy by consulting the physician and educate men and women during preconception period to avoid over the counter drugs to prevent occurrence of teratogenicity.

7.3.10 Availability of preconception care information

It is crucial to incorporate preconception messages in school curriculum in primary, secondary and tertiary level education so that people can utilise the information across the health continuum from adolescence to adult hood. There should be empowerment of communities to emphasise on the provision of PCC counselling that would be incorporated during church counselling. Female and male counsellors for girls and boys

should acquire the necessary information on PCC. There should be advertisement of preconception messages on the radio, television, health facility posters, billboards and road signs to increase society awareness of the value of PCC.

7.4 CONCLUSIONS

Maternal and neonatal mortality remains high despite many strategies that have been put in place to its reduction. Provision of standardised PCC would improve the health of men and women of childbearing age including adolescents. Health promotion messages should include preconception messages that would assist couples and individuals to have the information for them to access the care. Health care providers should be guided with the relevant preconception strategies for them to offer appropriate care that would improve maternal and newborn outcome. Research shows that men and women that use PCC are at lower risk of poor pregnancy outcomes than those that do not have access to it. The purpose of the study was to identify the relevant PCC guidelines that would assist men and women of childbearing age to improve pregnancy outcomes. The findings indicated some gaps that need to be addressed to improve the provision of information and care to have a healthy pregnancy outcome.

7.5 RECOMMENDATIONS

The study identified the relevant preconception strategies that would be utilised in health care settings to assist to improve maternal and newborn outcome done prior to pregnancy period. Since PCC is provided haphazardly in health care and community settings, the recommendations will standardise the interventions that should be done at any encounter with adolescents and men and women of childbearing age. The guidelines will stipulate the appropriate information and care that should be included to provide comprehensive PCC. Provision of preconception interventions will require more human resources, infrastructure, technology, and finance. There is always a starting point where Malawi would implement PCC.

It is important to reinforce the Malawian government to introduce PCC in schools, communities and health care facilities. There should be PCC in wellness centres and in public/private health care facilities.

7.5.1 Availability and accessibility of preconception care

Most respondents did not have the information and knowledge to use PCC despite accessing health care facilities and partial care provided to assist to have a healthy maternal and newborn outcome.

- There should be availability of wellness care clinics where individuals, couples and families should access to have the information and care on PCC. Adolescents, men and women should have opportunity to have risk assessments and care prior to pregnancy.
- Some of the PCC interventions and information should be provided during any encounter with clients that come to the health care facility like antenatal care, under five clinics, family planning clinic and postnatal clinic to create awareness on services available for PCC.
- Antenatal care should be extended to include PCC taking into account adolescents, men and women of childbearing age to capture a wide audience.
- Specific counselling should be provided in the wellness clinic according to the patients' need, according to age, parity, occupation, and marital status.
- Supplementation of vitamins and nutrients should be started such as provision of folic acid to women of childbearing age that intend to get pregnant to improve growth and development of the foetus.

7.5.2 Education and training on provision and use of preconception care

Health care providers that deal with adolescents, men and women of childbearing age need to be equipped with the appropriate information on PCC.

- Literacy rate of Malawian population should improve from 65.75% for all adult population in Malawi and 59% for women, which indicate that some of the population cannot read and write to access health care information messages like PCC to improve maternal and newborn health.
- Emphasis should be made to have empowerment for girls and women to made decision on reproductive health choices that would assist to improve use of PCC

- The Reproductive Health Unit in Malawi should replicate to conduct the study at a larger scale to identify the needs and information that should be incorporated in the reproductive health policy to include provision of PCC.
- Preconception strategies developed should be disseminated to all health care providers for Malawi to have standardised care that would be provided to all the population across the continuum.
- School curricula from primary, secondary and tertiary level should incorporate PCC information to increase awareness and use of the knowledge to improve maternal and newborn health across the continuum.

7.5.3 Specific strategies on provision of preconception care

The study identified the specific interventions through conducting the quantitative research, literature review and recommendations from a consensus by stakeholders. Specific actions were identified to be provided to men and women of childbearing age to improve maternal and newborn care. They are as follows:

- Planned parenthood was identified as one of the actions that would assist a healthy outcome of the mother and the baby as it enhances proper adjustment of the mother and the baby both psychologically and physiologically towards pregnancy.
- Knowledge and use of family planning methods and HTSP should be incorporated in provision of PCC to assist patients to have pregnancies at the recommended time like at an appropriate maternal age, birth spacing and when there are minimal risks to have a pregnancy.
- Risk assessment before conception should be conducted to rule out and treat any medical and surgical conditions, nutritional problems and infectious diseases that would have detrimental effects on pregnancy.
- Immunisations and prevention of illicit drugs in pregnancy should be done to minimise risks on maternal and newborn health during the perinatal cycle.
- Environmental screening from home, work, genetic and social hazards should be conducted at all cost to control adverse effects on the mother and the growing foetus.

7.5.4 Awareness of health promotion messages to the malawian population

Health promotion messages on PCC should be advertised to all communities even the hard to reach areas utilising all media platforms to access all the people.

- Most of the people accessing the health care facilities should be provided with preconception messages that would assist them to make an appropriate choice to have a healthy pregnancy. Health education information should be provided according to the need of the patients to time the pregnancy when there are minimal risks.
- Posters, leaflets and flyers should be available to advertise and inform the men and women of childbearing age to make informed choices on use of preconception messages.
- Mass media like television, radio, print and outdoor media, internet and social media should have health promotion messages that would inform the people on benefits and use of PCC to increase awareness.

7.5.5 Recommendations for future research

Preconception health care needs to be integrated to the health care package in Malawi and there is a need for more research studies to be conducted to have the care that will meet the needs of patients.

- There is a need to have a Malawian qualitative study that would obtain a richer data from men and women of childbearing age and health care providers to gain insights that would improve provision of PCC.
- Intervention studies that would address provision of PCC should be conducted to identify appropriate interventions on treatment, counselling and health education that would meet the needs of clients in a Malawian setting. Intervention studies should target both health care providers and patients.
- The same study can be done at a larger scale to have guidelines that would be applicable and generalised to the whole Malawian population.

7.6 CONTRIBUTIONS OF THE STUDY

The significance of the findings should not be underestimated despite that the study was conducted in the southern part of Malawi of the three regions in an urban and semi-urban area in the three clinics. The findings could be transferable to other settings of similar characteristics to have factors that would influence the provision of PCC. Extensive literature search on studies conducted in other countries assisted to develop PCC strategies that would contribute to reduction of maternal and newborn mortality rate that remains very high even in the 21st century in Malawi. The strategies developed will assist policy makers to integrate preconception health care when providing maternal and newborn health. The health promotion messages that are cost effective should be priority interventions to address some factors that contribute to high maternal and newborn mortality rate in Malawi. Policy documents that address the provision of maternal and newborn health should incorporate PCC strategies that will reinforce the provision of care from adolescents to adulthood.

The guidelines developed will stimulate interest to conduct further research studies that would assist in the provision of standardised PCC that is relevant, affordable and accessible according to the Malawian context. Despite some of the strategies and intervention being costly owing to lack of high technology, there is always a starting point to implement some of the concepts.

The study provides a groundwork from which future research can be conducted at a larger scale to assist to develop relevant preconception strategies that would improve maternal and newborn outcome.

7.7 LIMITATIONS OF THE STUDY

The study was conducted in only three clinics of the southern part of Malawi in an urban and semi-urban location despite that the majority of Malawian population being concentrated more in rural areas. Time and financial constraints limited the researcher to conduct the study at a larger scale as the study was conducted to fulfil the requirements of pursuing a doctor of philosophy degree in health studies according to Unisa. However, the findings cannot be generalised to all the Malawian population to have the factors that could influence the provision of PCC. Some other settings could provide additional

information that could be used to develop necessary guidelines that would improve the outcome of pregnancy. The study inclusion criteria included only men and women of childbearing age but the issue should cut across the health continuum from adolescent to adulthood. All clients of different ages need awareness on PCC and access it.

The study would have had rich information for triangulation if the study used mixed methods to collect information. Rich information according to the respondents' perspective would have been used to provide relevant strategies that are tailored according to the needs of the people. If health care providers had relevant information on provision of PCC, this study could have provided different findings. Despite the limitations, there is need to replicate the study on other study settings to have more information that can assist to develop the relevant preconception guidelines that can be implemented in Malawi.

7.8 CONCLUDING REMARKS

The study findings indicated some gaps in provision of PCC in Blantyre Urban District. There are no guidelines that are available to assist health care providers to provide comprehensive PCC. Some of the strategies are erratically provided in different facilities generating a need to have the standardised guidelines that would measure the care that is provided to patients. The relevant strategies will assist health care providers to institute interventions to improve pregnancy outcome of the mother and the baby. Lassi et al (2014:9) highlight the significance of extending antenatal care services to include PCC that will include adolescents, women of childbearing age and all high-risk women. Reduction of maternal and child mortality rates is the utmost and urgent concern in Malawi, which one of the strategies to address the issue could be provision of PCC package. PCC package should include planned parenthood, HTSP, screening for risks, infection prevention, nutritional supplementation, reproductive health planning, genetic counselling, prevention of illicit drugs, and prevention of exposure to environmental hazards. Comprehensive maternal and child health care could be provided by including PCC to antenatal care that is universally provided in Malawi. PCC should be included from primary, secondary and tertiary level of education to create awareness from adolescence to adulthood.

LIST OF REFERENCES

Agricola, E, Gesualdo, F, Carloni, E, D'Ambrosio, A, Russo, L, Campagna, I, Pandolfi, E & Tozzi, A. 2016. Investigating paternal preconception risk factors for adverse pregnancy outcomes in a population of internet users. *Reproductive Health* 13(1):1-7.

Agricola, E, Pandolfi, E, Gonfiantini, M, Gesualdo, F, Romano, M, Carloni, E, Mastroiacovo, P & Tozzi, A. 2014. A cohort study of a tailored web intervention for PCC. *BMC Medical Informatics and Decision Making* 14(1):1-8.

Ajaero, C, Odimegwu, C, Ajaero, I & Nwachukwu, C. 2016. Access to mass media messages and use of family planning in Nigeria: a spatio-demographic analysis from the 2013 DHS. *BMC Public Health* 16(1):1-10.

Al-Akour, N, Sou'Ub, R, Mohammad, K & Zayed, F. 2014. Awareness of PCC among women and men: A study from Jordan. *Journal of Obstetrics and Gynaecology* 35(3):246-250.

Alio, A, Lewis, C, Scarborough, K, Harris, K & Fiscella, K. 2013. A community perspective on the role of fathers during pregnancy: a qualitative study. *BMC Pregnancy and Childbirth* 13(1).1-11

Amu, H & Nyarko, S. 2016. Trends in contraceptive practices among women in reproductive age at a health facility in Ghana: 2011–2013. *Contraception and Reproductive Medicine* 1(1):1-5.

Andale. 2012. *Slovin's Formula: What is it and when do I use it?* [Online]. Available at: http://www.statisticshowto.com/how-to-use-slovins-formula/ (accessed 20 July 2015).

Anderson, J, Ebrahim, S, Floyd, L & Atrash, H. 2006. Prevalence of risk factors for adverse pregnancy outcomes during pregnancy and the preconception period — United States, 2002–2004. *Maternal and Child Health Journal* 10(6):575-575.

Anon. 2017. *What you need to know counselling patients on PCC: Folate and beyond*. [Online]. Available at: https://www.pcc.edu/resources/counseling/:// (accessed 19 March 2017).

Arambepola, C & Rajapaska, L. 2014. Decision-making on unsafe abortions in Sri Lanka: A case-control study. *Reproductive Health* 11(1):91-99.

Armstrong, MMD, Rueda, J, Gronseth, G & Mullins M. 2017. *Framework for enhancing clinical practice guidelines through continuous patient engagement. Health Expectations* 20:3-10. [Online]. Available at: http://onlinelibrary.wiley.com/doi/10.1111/hex.12467/epdf (accessed 8 November 2017).

Aransiola, J, Akinyemi, A & Fatusi, A. 2014. Women's perceptions and reflections of male partners and couple dynamics in family planning adoption in selected urban slums in Nigeria: a qualitative exploration. *BMC Public Health* 14(1):1-14.

Arslantaş, H, Adana, F, Ergin, F, Gey, N, Biçer, N & Kıranşal, N. 2012. Domestic violence during pregnancy in an Eastern City of Turkey. *Journal of Interpersonal Violence*, 27(7):1293-1313.

Ayalew, Y, Mulat, A, Dile, M & Simegn, A. 2017. Women's knowledge and associated factors in PCC in adet, west gojjam, northwest Ethiopia: A community based cross sectional study. *Reproductive Health* 14(1):1-10.

Avortri, GS. 2015. *Development of guidelines to improve client centred childbirth services in Ghana.* Phd thesis. UNISA. Pretoria.

Baïz, N, Slama, R, Béné, M, Charles, M, Kolopp-Sarda, M, Magnan, A, Thiebaugeorges, O, Faure, G & Annesi-Maesano, I. 2011. Maternal exposure to air pollution before and during pregnancy related to changes in newborn's cord blood lymphocyte subpopulations. The EDEN study cohort. *BMC Pregnancy and Childbirth* 11(1):1-6.

Barrett, G, Shawe, J, Howden, B, Patel, D, Ojukwu, O, Pandya, P & Stephenson, J. 2015. Why do women invest in pre-pregnancy health and care? A qualitative investigation with women attending maternity services. *BMC Pregnancy and Childbirth* 15(1):1-15.

Basics Healthy Timing and Spacing of Pregnancy. 2009. *Advocacy presentation: What is HTSP?* [Online]. Available at: www.usaid gov/our work/global health (accessed 12 April 2015).

Bazile, J, Rigodon, J, Berman, L, Boulanger, V, Maistrellis, E, Kausiwa, P & Yamin, A. 2015. Intergenerational impacts of maternal mortality: Qualitative findings from rural Malawi. *Reproductive Health* 12(Suppl 1):S1.

Belizán, J, Hofmeyr, J, Buekens, P & Salaria, N. 2013. Preterm birth, an unresolved issue. *Reproductive Health* 10(1):58.

Bialystock, L, Poole, N & Greaves, L. 2013. Preconception care: Call for national guidelines. *Canadian Family Physician* 59:1037-1039.

Blaževičienė, A, Jakušovaitė, I & Vaškelytė, A. 2014. Attitudes of fertile and infertile woman towards new reproductive technologies: A case study of Lithuania. *Reproductive Health* 11(1):1-7.

Blencowe, H, Cousens, S, Chou, D, Oestergaard, M, Say, L, Moller, A, Kinney, M & Lawn, J. 2013. Born too soon: The global epidemiology of 15 million preterm births. *Reproductive Health* 10(Suppl 1):1-14.

Bombard, J, Robbins, C, Dietz, P & Valderrama, A. 2013. PCC: The perfect opportunity for health care providers to advise lifestyle changes for hypertensive women. *American Journal of Health Promotion* 27(sp3):S43-S49.

Bonte, P, Pennings, G & Sterckx, S. 2014. Is there a moral obligation to conceive children under the best possible conditions? A preliminary framework for identifying the preconception responsibilities of potential parents. *BMC Medical Ethics* 15(1):1-10.

Bortolus, R, Oprandi, N, Rech Morassutti, F, Marchetto, L, Filippini, F, Agricola, E, Tozzi, A, Castellani, C, Lalatta, F, Rusticali, B & Mastroiacovo, P. 2017. Why women do not ask for information on preconception health? A qualitative study. *BMC Pregnancy and Childbirth* 17(1):1-8.

Boyce, P, Condon, J, Barton, J & Corkindale, C. 2007. First-time fathers' study: psychological distress in expectant fathers during pregnancy. *Australian and New Zealand Journal of Psychiatry* 41(9):718-725.

Bryman, A. 2012. *Social research methods*. New York. Oxford University Press.

Burns, N & Grove, S. 2005. *The practice of nursing research*. St Louis: Mosby: Elsevier/Saunders.

Burns, N & Grove, S. 2009. *The practice of nursing research*. St Louis: Mosby: Elsevier/Saunders.

Caskey, R, Stumbras, C, Rankin, K, Osta, K, Haider, A & Handler, A. 2016. A novel approach to postpartum contraception: a pilot project of Paediatricians' role during the well-baby visit. *Contraception and Reproductive Medicine* 1(1):1-8.

Cefalo, R & Moos, M-K.1995. *Preconception health care: A practical guide*. St Louis: Missouri Mosby Press.

Chan, L, Chalupka, S & Barrett, R. 2015. Female college student awareness of exposures to environmental toxins in personal care products and their effect on preconception health. *Workplace Health and Safety* 63(2):64-70.

Chavarro, J, Rich-Edwards, J, Rosner, B & Willett, W. 2007. Diet and Lifestyle in the Prevention of Ovulatory Disorder Infertility. *Obstetrics and Gynecology* 110(5):1050-1058.

Chersich, M Urban, Venter, T, Wessels, A, Krause, A, Grey, G, Luchters, S & Viljoen. 2006. *Efavirenz use during pregnancy and for women of childbearing*. [Online]. Available at: https://aidsrestherapy.biomedcentral.com/articles/10.1186/1742-6405-3-11 (accessed 7 April 2017).

Choi, K, Abler, L, Watt, M, Eaton, L, Kalichman, S, Skinner, D, Pieterse, D & Sikkema, K. 2014. Drinking before and after pregnancy recognition among South African women: the moderating role of traumatic experiences. *BMC Pregnancy and Childbirth* 14(1):1-9.

Class, Q, Khashan, A, Lichtenstein, P, Langstrom, N & D'Onofrio, B. 2013. Maternal stress and infant mortality: The Importance of the preconception period. *Psychological Science* 24(7):1309-1316.

Coffey, K & Shorten, A. 2013. The challenge of preconception counseling: Using reproductive life planning in primary care. *Journal of the American Association of Nurse Practitioners* 26(5):255-262.

Corchia, C & Mastroiacovo, P. 2013. Health promotion for children, mothers and families: Here's why we should "think about it before conception". *Italian Journal of Pediatrics* 39(1):68.

Creswell, J & Plano Clark, V. 2011. *Designing and conducting mixed methods research*. Thousand Oaks, California: SAGE.

Curtis, M, Abelman, S, Schulkin, J, Williams, J & Fasset, E. 2006. Do we practice what we preach? A review of actual clinical practice with regards to PCC guidelines. *Maternal and Child Health Journal* 10(S1):53-58.

Dalaba, M, Stone, A, Krumholz, A, Oduro, A, Phillips, J & Adongo, P. 2016. A qualitative analysis of the effect of a community-based primary health care programme on reproductive preferences and contraceptive use among the Kassena-Nankana of northern Ghana. *BMC Health Services Research* 16(1):1-8.

DaVanzo, J, Hale, L, Razzaque, A & Rahman, M. 2007. Effects of interpregnancy interval and outcome of the preceding pregnancy on pregnancy outcomes in Matlab, Bangladesh. *BJOG: An International Journal of Obstetrics and Gynaecology* 114(9):1079-1087.

Davidson, M, London, M, Ladewig, P & Davidson, M. 2012. *Olds' maternal-newborn nursing and women's health across the lifespan*. 1st edition. Upper Saddle River: Pearson.

Davis, J, Vyankandondera, J, Luchters, S, Simon, D & Holmes, W. 2016. Male involvement in reproductive, maternal and child health: a qualitative study of policymaker and practitioner perspectives in the Pacific. *Reproductive Health* 13(1):1-11.

Das, A. 2016. *Alcohol, drugs and babies: Do you need to worry.* [Online]. Available at: https://www.healthline.com/health/pregnancy/alcohol-drugs (accessed 18 March 2018).

Day-Stirk, F, McConville, F, Campbell, J, Laski, L, Guerra-Arias, M, Hoope-Bender, P, Michel-Schuldt, M & De Bernis, L. 2014. Delivering the evidence to improve the health of women and newborns: State of the World's Midwifery, report 2014. *Reproductive Health* 11(1):89.

De Jong-Potjer, L, Elsinga, J, le Cessie, S, Van der Pal-de Bruin, K, Neven, A, Buitendijk, S & Assendelft, W. 2006. GP-initiated preconception counselling in a randomised controlled trial does not induce anxiety. *BMC Family Practice* 7(1):1-19.

De Wit, L, Jelsma, J, Van Poppel, M, Bogaerts, A, Simmons, D, Desoye, G, Corcoy, R, Kautzky-Willer, A, Harreiter, J, van Assche, A, Devlieger, R, Timmerman, D, Hill, D, Damm, P, Mathiesen, E, Wender-Ozegowska, E, Zawiejska, A, Rebollo, P, Lapolla, A, Dalfrà, M, Del Prato, S, Bertolotto, A, Dunne, F, Jensen, D, Andersen, L & Snoek, F. 2015. Physical activity, depressed mood and pregnancy worries in European obese pregnant women: results from the DALI study. *BMC Pregnancy and Childbirth* 15(1):1-10.

Dean, S, Imam, A, Lassi, Z & Bhutta, Z. 2012*. Systematic review of preconception risks and interventions.* [Online]. Available at: https://globalmotherchildresearch.tghn.org/site_media/media/articles/Preconception_Report.pdf (accessed 8 November 2017).

Dean, S, Lassi, Z, Imam, A & Bhutta, Z. 2014a. Preconception care: Nutritional risks and interventions. *Reproductive Health* 11(Suppl 3):1-15.

Dean, S, Lassi, Z, Imam, A & Bhutta, Z. 2014b. PCC: Promoting reproductive planning. *Reproductive Health* 11(Suppl 3):1-17.

Dean, S, Lassi, Z, Imam, A & Bhutta, Z. 2014c. Preconception care: closing the gap in the continuum of care to accelerate improvements in maternal, newborn and child health. *Reproductive Health* 11(Suppl 3):1-8.

Dean, S, Rudan, I, Althabe, F, Webb Girard, A, Howson, C, Langer, A, Lawn, J, Reeve, M, Teela, K, Toledano, M, Venkatraman, C, Belizan, J, Car, J, Chan, K, Chatterjee, S, Chitekwe, S, Doherty, T, Donnay, F, Ezzati, M, Humayun, K, Jack, B, Lassi, Z, Martorell, R, Poortman, Y & Bhutta, Z. 2013. *Setting research priorities for PCC in low- and middle-income countries: Aiming to reduce maternal and child mortality and morbidity*. *PLoS Med* 10(9):e1001508 (accessed 10 October 2017).

Debiso, A, Gello, B & Malaju, M. 2015. Factors associated with men's awareness of danger signs of obstetric complications and its effect on men's involvement in birth preparedness practice in Southern Ethiopia, 2014. *Advances in Public Health*:1-9.

Delissaint, D.2008. Exploring the factors associated with preconception health behaviours among women of childbearing age: A naturalistic inquiry. PhD thesis, Texas A & M University.

Demissie, D, Tebeje, B & Tesfaye, T. 2014. Fertility desire and associated factors among people living with HIV attending antiretroviral therapy clinic in Ethiopia. *BMC Pregnancy and Childbirth* 14(1): 1:10.

Denktaş, S, Jong-Potjer, L, Waelput, A, Temel, S, Voorst van, S, Vos, A, Schölmerich, V, Bonsel, G, Kooy van der J, Quispel, C, Poeran, V, Peters, I, Vujkovic, M, Bakker, R & Steegers, E. 2012. *Preconception care. A review of the literature*. University Medical Centre Rotterdam, Erasmus MC*, The Netherlands Department of Obstetrics and Gynecology,* Division of Obstetrics and Prenatal Medicine.

Denscombe, M. 2010. *The good research guide.* Maidehead, England: McGraw-Hill/Open University Press

Dibaba. 2013. *Improving child health through healthy timing and spacing of pregnancies in rural Ethiopia.* [Online]. Available at: https://www.google.com/search?q=Improving+Child+Health+through+Healthy+Timing+and+Spacing+of+Pregnancies+in+Rural+Ethiopia+&oq=Improving+Child+Health (accessed 2 April 2017).

Dippenaar, J, Da Serra, D & Sellers, P. 2012. *Sellers' midwifery*. 1st edition. Claremont, South Africa: Juta.

Draper, C, Micklesfield, L, Kahn, K, Tollman, S, Pettifor, J, Dunger, D & Norris, S. 2014. Application of Intervention Mapping to develop a community-based health promotion pre-pregnancy intervention for adolescent girls in rural South Africa: Project Ntshembo (Hope). *BMC Public Health* 14(Suppl 2):1-14.

Dunlop, A, Dretler, A, Badal, H & Logue, K. 2013. Acceptability and potential impact of brief preconception health risk assessment and counselling in the WIC setting. *American Journal of Health Promotion* 27(sp3):S58-S65.

Dunlop, A, Jack, B & Frey, K. 2007. National Recommendations for preconception care: The essential role of the family physician. *The Journal of the American Board of Family Medicine* 20(1):81-84.

Dunlop, A, Logue, K, Thorne, C & Badal, H. 2013. Change in women's knowledge of general and personal preconception health risks following targeted brief counselling in publicly funded primary care settings. *American Journal of Health Promotion* 27(sp3):S50-S57.

Ebrahim, S, Lo, S, Zhuo, J, Han, J, Delvoye, P & Zhu, L. 2006. Models of preconception care implementation in selected countries. *Maternal and Child Health Journal* 10(S1):37-42.

Elmusharaf, K, Byrne, E & O'Donovan, D. 2017. Social and traditional practices and their implications for family planning: a participatory ethnographic study in Renk, South Sudan. *Reproductive Health* 14(1):1-11.

Elsinga, J, Van der Pal-de Bruin, K, Le Cessie, S, De Jong-Potjer, L, Verloove-Vanhorick, S & Assendelft, W. 2006. Preconception counselling initiated by general practitioners in the Netherlands: Reaching couples contemplating pregnancy [ISRCTN53942912]. *BMC Family Practice* 7(1):1-8.

Endriyas, M, Eshete, A, Mekonnen, E, Misganaw, T, Shiferaw, M & Ayele, S. 2017. Contraceptive utilization and associated factors among women of reproductive age group in Southern Nations Nationalities and Peoples' Region, Ethiopia: Cross-sectional survey, mixed-methods. *Contraception and Reproductive Medicine* 2(1):1-9.

Esperat, C, Feng, D, Zhang, Y & Owen, D. 2007. Health behaviors of low-income pregnant minority women. *Western Journal of Nursing Research* 29(3):284-300.

Faye, C, Speizer, I, Fotso, J, Corroon, M & Koumtingue, D. 2013. Unintended pregnancy: magnitude and correlates in six urban sites in Senegal. *Reproductive Health* 10(1):59.1-10.

Floyd, R, Jack, B, Cefalo, R, Atrash, H, Mahoney, J, Herron, A, Husten, C & Sokol, R. 2008. The clinical content of preconception care: Alcohol, tobacco, and illicit drug exposures. *American Journal of Obstetrics and Gynecology* 199(6):S333-S339.

Freda, M, Moos, M & Curtis, M. 2006. The history of preconception care: Evolving guidelines and standards. *Maternal and Child Health Journal* 10(S1):43-52.

Frey, K & Files, J. 2006. Preconception healthcare: What women know and believe. *Maternal and Child Health Journal* 10(S1):73-77.

Frey, K, Navarro, S, Kotelchuck, M & Lu, M. 2008. The clinical content of preconception care: Preconception care for men. *American Journal of Obstetrics and Gynecology* 199(6):S389-S395.

Gadzhanova, S & Roughead, E. 2015. Use of prescription medicines in Australian women of childbearing age. *BMC Pharmacology and Toxicology* 16(1):1-12.

Gal, M, Khermesh, K, Barak, M, Lin, M, Lahat, H, Reznik Wolf, H, Lin, M, Pras, E & Levanon, E. 2016. Expanding preconception carrier screening for the Jewish population using high throughput microfluidics technology and next generation sequencing. *BMC Medical Genomics* 9(1):1-10.

Gardiner, P, Hempstead, M, Ring, L, Bickmore, T, Yinusa-Nyahkoon, L, Tran, H, Paasche-Orlow, M, Damus, K & Jack, B. 2013. Reaching Women through Health Information Technology: The Gabby Preconception Care System. *American Journal of Health Promotion* 27(sp3): eS11-eS20.

Gils, C, Pottegård, A, Ennis, Z & Damkier, P. 2016. Perception of drug teratogenicity among general practitioners and specialists in obstetrics/gynecology: a regional and national questionnaire-based survey. *BMC Pregnancy and Childbirth* 16(1):1-8.

Gizachew Balew, J, Cho, Y, Tammy Kim, C & Ko, W. 2015. Structural determinants in family planning service utilization in Ethiopia: EDHS 2011 Analysis. *BioMed Research International*:1-17.

Glanz, K, Rimer, K & Lewis, F. 2002. *Health behaviour and health education theory research and practice*. San Francisco: Jossey-Bass.

Godfrey, K, Cutfield, W, Chan, S, Baker, P & Chong, Y. 2017. *Nutritional intervention preconception and during pregnancy to maintain healthy glucose metabolism and offspring health* ("NiPPeR"): *Study protocol for a randomised controlled trial. Trials* 18(1):1-12.

Gray, D. (2014). *Doing research in the real world*. Sage publications. London.

Green-Raleigh, K, Carter, H, Mulinare, J, Prue, C & Petrini, J. 2006. Trends in folic acid awareness and behavior in the United States: The Gallup Organization for the March of Dimes Foundation Surveys, 1995–2005. *Maternal and Child Health Journal* 10(S1):177-182.

Goodfellow, A, Frank, J, McAteer, J & Rankin, J. 2017. Improving preconception health and care: a situation analysis. *BMC Health Services Research* 17(1):1-8.

Haile, K, Gebremedhin, M, Berhane, H, Gebremedhin, T, Abraha, A, Berhe, N, Haile, T, Gigar, G & Girma, Y. 2016. Desire for birth spacing or limiting and non-use of long acting and permanent contraceptive methods among married women of reproductive age in Aksum Town, North Ethiopia. *Contraception and Reproductive Medicine* 1(1):1-10.

Hami, MY. 2012. *Intentions to use cervical cancer screening services among women aged 42 and older in Malawi*. PhD dissertation. Unisa. Pretoria.

Hancock, N, Chibwesha, C, Stoner, M, Vwalika, B, Rathod, S, Kasaro, M, Stringer, E, Stringer, J & Chi, B. 2015. Temporal Trends and Predictors of Modern Contraceptive Use in Lusaka, Zambia, 2004–2011. *BioMed Research International*:1-8.

Hancock, N, Stuart, G, Tang, J, Chibwesha, C, Stringer, J & Chi, B. 2016. Renewing focus on family planning service quality globally. *Contraception and Reproductive Medicine* 1(1):1-6.

Harden, S, Ramalingam, N, Wilson, K & Evans-Hoeker, E. 2017. Informing the development and uptake of a weight management intervention for preconception: A mixed-methods investigation of patient and provider perceptions. *BMC Obesity* 4(1):1-12.

Haskins, A, Bertone-Johnson, E, Pekow, P, Carbone, E, Fortner, R & Chasan-Taber, L. 2010. Smoking during pregnancy and risk of abnormal glucose tolerance: a prospective cohort study. *BMC Pregnancy and Childbirth* 10(1):1-9

Haws, R, Yakoob, M, Soomro, T, Menezes, E, Darmstadt, G & Bhutta, Z. 2009. Reducing stillbirths: screening and monitoring during pregnancy and labour. *BMC Pregnancy and Childbirth* 9(Suppl 1):1-48.

Hayford, S & Guzzo, K. 2010. Age, relationship status, and the planning status of births. *Demographic Research* 23:365-398.

Hindin, M, Rodriguez, M, Gonsalves, L & Say, L. 2015. Adolescent health experience after abortion or delivery (AHEAD) trial: formative protocol for intervention development to prevent rapid, repeat pregnancy. *Reproductive Health* 12(1):1-6.

Hjortebjerg, D, Andersen, A, Garne, E, Raaschou-Nielsen, O & Sørensen, M. 2012. Non-occupational exposure to paint fumes during pregnancy and risk of congenital anomalies: A cohort study. *Environmental Health* 11(1):1-7.

Hoffman, S, Guindon, G, Lavis, J, Randhawa, H, Becerra-Posada, F, Boupha, B, Shi, G & Turdaliyeva, B. 2016. Clinicians' knowledge and practices regarding family planning and intrauterine devices in China, Kazakhstan, Laos and Mexico. *Reproductive Health* 13(1):1-12.

Hogan, V, Amamoo, M, Anderson, A, Webb, D, Mathews, L, Rowley, D & Culhane, J. 2012. Barriers to women's participation in inter-conceptional care: a cross-sectional analysis. *BMC Public Health* 12(1):1-10.

Holtkamp, K, Vos, E, Rigter, T, Lakeman, P, Henneman, L & Cornel, M. 2017. Stakeholder perspectives on the implementation of genetic carrier screening in a changing landscape. *BMC Health Services Research* 17(1):1-12.

Hui, A, Back, L, Ludwig, S, Gardiner, P, Sevenhuysen, G, Dean, H, Sellers, E, McGavock, J, Morris, M, Jiang, D & Shen, G. 2014. Effects of lifestyle intervention on dietary intake, physical activity level, and gestational weight gain in pregnant women with different pre-pregnancy Body Mass Index in a randomized control trial. *BMC Pregnancy and Childbirth* 14(1):1-9.

Hutchinson, K, Moore, G, Propper, C & Mariaskin, A. 2008. *Incarcerated women's psychological functioning during pregnancy. Psychology of Women* Quarterly 32(4):440-453. [Online]. Available at: https://www.google.com/search?q=map+of+malawi+showing++southern+region+of++Malawi+blantyre&tbm (accessed 8 November 2017).

Huang, A, Ji, Z, Zhao, W, Hu, H, Yang, Q & Chen, D. 2016. Rate of gestational weight gain and preterm birth in relation to prepregnancy body mass indices and trimester: a follow-up study in China. *Reproductive Health* 13(1):1-7

Johannes, S, Wondafrash, M, Abera, M & Girma, E. 2011. Duration and determinants of birth interval among women of childbearing age in Southern Ethiopia. *BMC Pregnancy and Childbirth* 11(1):1-6.

John Hopkins University. 2010. JHSH *human subjects research ethics field training guide.* [Online]. Available at: www.jhsph.ed/offices - and services/institutional - review board/ - pdfs and -docs/field- guide (accessed 1 April 2016).

Johnson, K, Posner, S, Biermann, J, Cordero, J, Atrash, H, Parker, C, Boulet, S, Curtis & M. 2006. *Recommendations to improve preconception health and health care - United States.* A report of the CDC/ATSDR preconception care work group and the select panel on preconception care (RR-6):1-23.

Jones, J, Mosher, W & Daniels. P. 2012. Current contraceptive use in the United States 2006-2010, and changes in patterns of use since 1995. *National Health Statistics Report*. Number 60.

K4health.org. 2015. *Healthy timing and spacing of pregnancy toolkit* | *K4Health*. [Online]. Available at: https://www.k4health.org/toolkits/HTSP (accessed 14 February 2015).

Kabagenyi, A, Jennings, L, Reid, A, Nalwadda, G, Ntozi, J & Atuyambe, L. 2014. Barriers to male involvement in contraceptive uptake and reproductive health services: A qualitative study of men and women's perceptions in two rural districts in Uganda. *Reproductive Health* 11(1):21, 1-9.

Kachingwe-Sisya, MM. 2014. *Factors influencing treatment adherence amongst hypertensive patients at Queen Elizabeth Central Hospital, Blantyre, Malawi*. PhD dissertation. Unisa: Pretoria.

Khanal, V, Adhikari, M, Karkee, R & Gavidia, T. 2014. Factors associated with the utilisation of postnatal care services among the mothers of Nepal: analysis of Nepal Demographic and Health Survey 2011. *BMC Women's Health* 14(1):1-13

Kane, S, Kok, M, Rial, M, Matere, A, Dieleman, M & Broerse, J. 2016. Social norms and family planning decisions in South Sudan. *BMC Public Health* 16(1):1-12.

Kawale, P, Mindry, D, Phoya, A, Jansen, P & Hoffman, R. 2015. Provider attitudes about childbearing and knowledge of safer conception at two HIV clinics in Malawi. *Reproductive Health* 12(1):1-7.

Kendall, T, Danel, I, Cooper, D, Dilmitis, S, Kaida, A, Kourtis, A, Langer, A, Lapidos-Salaiz, I, Lathrop, E, Moran, A, Sebitloane, H, Turan, J, Watts, D & Wegner, M. 2014. Eliminating Preventable HIV-Related Maternal Mortality in Sub-Saharan Africa. *JAIDS Journal of Acquired Immune Deficiency Syndromes* 67: S250-S258.

Khan, A & Shaikh, B. 2013. An all-time low utilization of intrauterine contraceptive device as a birth spacing method - a qualitative descriptive study in district Rawalpindi, Pakistan. *Reproductive Health* 10(1):1-5.

King, R, Khana, K, Nakayiwa, S, Katuntu, D, Homsy, J, Lindkvist, P, Johansson, E & Bunnell, R. 2011). Pregnancy comes accidentally - like it did with me: Reproductive decisions among women on ART and their partners in rural Uganda. *BMC Public Health* 11(1):1-11.

Kitamura, K, Fetters, M & Ban, N. 2005. Preconception care by family physicians and general practitioners in Japan. *BMC Family Practice* 6(1):1-8.

Kothari, C. 2004. *Research methodology*. New Delhi: New Age.

Kumar, S. 2011. Occupational, environmental and lifestyle factors associated with spontaneous abortion. *Reproductive Sciences* 18(10):915-930.

Kumbani, L. 2006. Maternal and Newborn Health in Malawi. *Malawi Medical Journal*: 19(1) 32-33 March 2006.

Kura, S, Vince, J & Crouch-Chivers, P. 2013. Male involvement in sexual and reproductive health in the Mendi district, Southern Highlands province of Papua New Guinea: a descriptive study. *Reproductive Health* 10(1):1-10.

Lachance-Grzela, M & Bouchard, G. 2009. The well-being of cohabiting and married couples during pregnancy: Does pregnancy planning matter? *Journal of Social and Personal Relationships* 262-263:141-159.

Lassi, Z, Imam, A, Dean, S & Bhutta, Z. 2014a. Preconception care: screening and management of chronic disease and promoting psychological health. *Reproductive Health* 11(Suppl 3):S5, 1-20.

Lassi, Z, Imam, A, Dean, S & Bhutta, Z. 2014b. Preconception care: caffeine, smoking, alcohol, drugs and other environmental chemical/radiation exposure. *Reproductive Health* 11(Suppl 3):S6, 2-12

Lassi, Z, Kumar, R, Mansoor, T, Salam, R, Das, J & Bhutta, Z. 2014c. Essential interventions: implementation strategies and proposed packages of care. *Reproductive Health* 11(Suppl 1):S5, 1-17.

Lester, B, Andreozzi, L & Appiah L. 2005. Substance use during pregnancy: time for policy to catch up with research. *Harm Reduction Journal* 1-5.

Lie, M, Robson, S & May, C. 2008. Experiences of abortion: A narrative review of qualitative studies. *BMC Health Services Research* 8(1):1-9.

Liu, L, Setse, R, Grogan, R, Powe, N & Nicholson, W. 2013. The effect of depression symptoms and social support on black-white differences in health-related quality of life in early pregnancy: the health status in pregnancy (HIP) study. *BMC Pregnancy Childbirth* 13(1):1-9.

Lu, M, Kotelchuck, M, Culhane, J, Hobel, C, Klerman, L & Thorp, J. 2006. PCC between Pregnancies: The Content of Internatal Care*. Maternal Child Health Journal* 10(S1):107-122.

Lynch, M, Squiers, L, Lewis, M, Moultrie, R, Kish-Doto, J, Boudewyns, V, Bann, C, Levis, D & Mitchell, E. 2014. Understanding Women's Preconception Health Goals: Audience Segmentation Strategies for a Preconception Health Campaign. *Social Marketing Quarterly* 20(3):148-164.

Mack, J & Chavez, J. 2014. Cumulative effects of maternal age and unintended pregnancy on offspring aggression. *Journal of Interpersonal Violence* 29(16):2931-2950.

Mahmud, M & Mazza, D. 2010. PCC of women with diabetes: a review of current guideline recommendations. *BMC Women's Health* 10(1):1-7.

Malawi Government. 2011. *Road map for accelerating the reduction of maternal and neonatal mortality in Malawi*. Ministry of Health, Lilongwe, Malawi.

Malawi Government. 2009. *National sexual and reproductive health and right (SRHR) policy*. Ministry of Health, Lilongwe, Malawi.

Malawi Government. 2010a. *Results from the demographic and health survey.* Studies in Family Planning 432:147-152.

Malawi Government. 2010b. *Malawi demographic and health survey*. National Statistical Office, Zomba, Malawi.

Malawi Government. 2011. *Clinical management of HIV in children and adults. Malawi integrated guidelines for providing HIV services in: Antenatal care, maternity care and underfive care, family planning clinic, exposed infant/Pre-ART clinics and ART clinic*. Zomba, Malawi.

Malawi Government. 2013. *National statistical system, strategic plan 2013-2017 statistics of fingertips for users for evidence-based decision makers*. Zomba, Malawi.

Malawi Government. 2015. *Participant manual in maternal and neonatal health*. Ministry of Health, Lilongwe, Malawi.

Malawi Government. 2015-16. *Demographic and health survey key findings*. National Statistical Office, Zomba, Malawi.

Malawi Language Stats, NationMaster [s.a.]. [Online]. Available at: http://www.nationmaster.com/country-info/profiles/Malawi/Language (accessed 22 March 2018).

Malouf, R, Redshaw, M, Kurinczuk, J & Gray, R. 2014. Systematic review of heath care interventions to improve outcomes for women with disability and their family during pregnancy, birth and postnatal period. *BMC Pregnancy and Childbirth* 14(1):1-12.

Mamun, A, Callaway, L, O'Callaghan, M, Williams, G, Najman, J, Alati, R, Clavarino, A & Lawlor, D. 2011. Associations of maternal pre-pregnancy obesity and excess pregnancy weight gains with adverse pregnancy outcomes and length of hospital stay. *BMC Pregnancy and Childbirth* 11(1):1-9.

Maoulidi, M. 2013. *Health needs assessment for Blantyre City Malawi, Columbia University Academic committee*. [Online]. Available at: http://dx.org/107916/D8NSOSPB (accessed 20 January 2016).

Masho, S, Bassyouni, A & Cha, S. 2016. Pre-pregnancy obesity and non-adherence to multivitamin use: Findings from the National Pregnancy Risk Assessment Monitoring System 2009–2011. *BMC Pregnancy and Childbirth* 16(1):1-10.

Masho, S, Cha, S, Charles, R, McGee, E, Karjane, N, Hines, L & Kornstein, S. 2016. Postpartum visit attendance increases the use of modern contraceptives. *Journal of Pregnancy*:1-7.

Mason, E, Chandra-Mouli, V, Baltag, V, Christiansen, C, Lassi, Z & Bhutta, Z. 2014. PCC: Advancing from 'important to do and can be done' to 'is being done and is making a difference'. *Reproductive Health* 11(Suppl 3): 1-9.

Mastroiacovo, P, Nilsen, R, Leoncini, E, Gastaldi, P, Allegri, V, Boiani, A, Faravelli, F, Ferrazzoli, F, Guala, A, Madrigali, V & Scarano, G. 2014. Prevalence of maternal preconception risk factors: an Italian multicenter survey. *Italian Journal of Pediatrics* 40(1):1-8.

Mazza, D, Chapman, A & Michie, S. 2013. Barriers to the implementation of PCC guidelines as perceived by general practitioners: a qualitative study. *BMC Health Services Research* 13(1):1-8.

McDougal, L, Rusch, M, Silverman, J & Raj, A. 2016. Linkages within the reproductive and maternal health continuum of care in Bangladesh. *Asia Pacific Journal of Public Health* 28(5):423-437.

McGready, R, Boel, M, Rijken, M, Ashley, E, Cho, T, Moo, O, Paw, M, Pimanpanarak, M, Hkirijareon, L, Carrara, V, Lwin, K, Phyo, A, Turner, C, Chu, C, van Vugt, M, Price, R, Luxemburger, C, ter Kuile, F, Tan, S, Proux, S, Singhasivanon, P, White, N & Nosten, F. 2012. *Effect of early detection and treatment on malaria related maternal mortality on the northwestern border of Thailand* 1986–2010. PLoS ONE 7(7): e40244. [Online]. Available at: https://doi.org/10.1371/journal.pone.0040244 (accessed 5 January 2016).

Mehata, S, Paudel, Y, Dotel, B, Singh, D, Poudel, P & Barnett, S. 2014. Inequalities in the use of family planning in rural Nepal. *BioMed Research International*:1-7.

Mellingen, S, Torsheim, T & Thuen, F. 2013. Changes in alcohol use and relationship satisfaction in Norwegian couples during pregnancy. *Substance Abuse Treatment, Prevention, and Policy* 8(1):1-11.

Menezes, E, Yakoob, M, Soomro, T, Haws, R, Darmstadt, G & Bhutta, Z. 2009. Reducing stillbirths: prevention and management of medical disorders and infections during pregnancy. *BMC Pregnancy and Childbirth* 9(Suppl 1):1-49.

Michel, B & Charron-Prochownik, D. 2006. Diabetes nurse educators and preconception counselling. *The Diabetes Educator* 32(1):108-116.

Mkandawire, N & Kaunda, E. 2001. *An audit of congenital anomalies in the neonatal unit of Queen Elizabeth Central Hospital*. One-year study period: 1 November 2000 to 31 October 2001.

Mohammed, A, Woldeyohannes, D, Feleke, A & Megabiaw, B. 2014. Determinants of modern contraceptive utilization among married women of reproductive age group in North Shoa Zone, Amhara Region, Ethiopia. *Reproductive Health* 11(1):1-8.

Moule, P & Goodman, M. 2009. *Nursing research: An introduction*. London: Sage.

Mosha, D, Mazuguni, F, Mrema, S, Abdulla, S & Genton, B. 2014. Medication exposure during pregnancy: a pilot pharmacovigilance system using health and demographic surveillance platform. *BMC Pregnancy and Childbirth* 14(1):1-10.

Mosha, I, Ruben, R & Kakoko, D. 2013. Family planning decisions, perceptions and gender dynamics among couples in Mwanza, Tanzania: a qualitative study. *BMC Public Health* 13(1):1-6

Muganyizi, P & Mageta, D. 2013. Does the use of modern family planning promote healthy timing and spacing of pregnancy in Dar es Salaam? *Reproductive Health* 10(1):65.

Mumford, S, Michels, K, Salaria, N, Valanzasca, P & Belizán, J. 2014. Preconception care:lit's never too early. *Reproductive Health* 11(1):1-3.

Mustafa, G, Azmat, S, Hameed, W, Ali, S, Ishaque, M, Hussain, W, Ahmed, A & Munroe, E. 2015. Family planning knowledge, attitudes, and practices among married men and women in rural areas of Pakistan: Findings from a qualitative need assessment study. *International Journal of Reproductive Medicine*:1-8.

Ng, R, Macdonald, E, Loutfy, M, Yudin, M, Raboud, J, Masinde, K, Bayoumi, A, Tharao, W, Brophy, J, Glazier, R & Antoniou, T. 2015. Adequacy of prenatal care among women living with human immunodeficiency virus: A population-based study. *BMC Public Health* 15(1):1-8.

Nilsen, R, Leoncini, E, Gastaldi, P, Allegri, V, Agostino, R, Faravelli, F, Ferrazzoli, F, Finale, E, Ghirri, P, Scarano, G & Mastroiacovo, P. 2016. Prevalence and determinants of preconception folic acid use: An Italian multicenter survey. *Italian Journal of Pediatrics* 42(1):1-10.

Norris, S, Ho, J, Rashed, A, Vinding, V, Skau, J, Biesma, R, Aagaard-Hansen, J, Hanson, M & Matzen, P. 2016. Pre-pregnancy community-based intervention for couples in Malaysia: application of intervention mapping. *BMC Public Health* 16(1):1-7.

Ogbonnaya, I, Macy, R, Kupper, L, Martin, S & Bledsoe-Mansori, S. 2013. Intimate partner violence and depressive symptoms before pregnancy, during pregnancy, and after infant delivery. *Journal of Interpersonal Violence* 28(10):2112-2133.

Okigbo, C, Speizer, I, Corroon, M & Gueye, A. 2015. Exposure to family planning messages and modern contraceptive use among men in urban Kenya, Nigeria, and Senegal: a cross-sectional study. *Reproductive Health* 12(1):1-11.

Payne, J, Watkins, R, Jones, H, Reibel, T, Mutch, R, Wilkins, A, Whitlock, J & Bower, C. 2014. Midwives' knowledge, attitudes and practice about alcohol exposure and the risk of foetal alcohol spectrum disorder. *BMC Pregnancy and Childbirth* 14(1):1-13.

Pender, N, Murdaugh, C L, & Parsons, MA. 2011. *Health promotion in nursing practice*. 6th edition. Boston, MA: Pearson. [Online]. Available at: http://nursing.umich.edu/faculty-staff/nola-j-pender (accessed on 15 August 2015).

Peterson, S & Bredow, T. 2004. *Middle range theories*. New York: Lippincott Williams and Wilkins.

Poels, M, Koster, M, Franx, A & Van Stel, H. 2017. Healthcare providers' views on the delivery of preconception care in a local community setting in the Netherlands. *BMC Health Services Research* 17(1):1-10.

Polit, D & Beck, C. 2010. *Essentials of nursing research*. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.

Polit, D, Beck, C & Polit, D. 2012. *Resource manual for nursing research*. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.

Poscia, A, La Milia, D, Lohmeyer, F, Teleman, A, De Waure C & Ricciardi, W. 2015. Sexual behaviours and preconception health in Italian university students. *Ann Ist Super Sanità* 51(2):116-120

Posner, S, Johnson, K, Parker, C, Atrash, H & Biermann, J. 2006. The national summit on preconception care: A summary of concepts and recommendations. *Maternal and Child Health Journal* 10(S1):199-207.

Puri, M, Lamichhane, P, Harken, T, Blum, M, Harper, C, Darney, P & Henderson, J. 2012. Sometimes they used to whisper in our ears: Health care workers' perceptions of the effects of abortion legalization in Nepal*. BMC Public Health* 12(1):1-9.

Reime, B, Schücking, B & Wenzlaff, P. 2008. Reproductive outcomes in adolescents who had a previous birth or an induced abortion compared to adolescents' first pregnancies. *BMC Pregnancy and Childbirth* 8(1):1-7.

Rohra, D, Das, N, Azam, S, Solanki, N, Memon, Z, Shaikh, A & Khan, N. 2008. Drug-prescribing patterns during pregnancy in the tertiary care hospitals of Pakistan: a cross sectional study. *BMC Pregnancy and Childbirth* 8(1):1-5.

Sagel, U., Krämer, A. & Mikolajczyk, R. (2011). Incidence of maternal Toxoplasma infections in pregnancy in Upper Austria, 2000-2007. *BMC Infectious Diseases*, 11(1):1-7.

Shadab, P, Nakuei, N & Yagadagafar, G. 2017. Prevalence of prepregnancy risk factors and its relationship with preconception care in Isfahon. *Int J Pediatr* 5(44):5463-5471.

Salam, R, Mansoor, T, Mallick, D, Lassi, Z, Das, J & Bhutta, Z. 2014. Essential childbirth and postnatal interventions for improved maternal and neonatal health. *Reproductive Health* 11(Suppl 1):1-17.

Salaria, N, Valanzasca, MS, Michels, KP & Belizan, J. 2014. Preconception care: It's never too early. *Reproductive Health* 11(1):1-3.

Salihu, H, Salinas, A & Mogos, M. 2012. The missing link in preconceptional care: The role of comparative effectiveness research. *Maternal and Child Health Journal* 17(5):776-782.

Salisbury, P, Hall, L, Kulkus, S, Paw, M, Tun, N, Min, A, Chotivanich, K, Srikanok, S, Ontuwong, P, Sirinonthachai, S, Nosten, F, Somerset, S & McGready, R. 2016. Family planning knowledge, attitudes and practices in refugee and migrant pregnant and post-partum women on the Thailand-Myanmar border – a mixed methods study. *Reproductive Health* 13(1):1-13.

Sarkar, A, Chandra-Mouli, V, Jain, K, Behera, J, Mishra, S & Mehra, S. 2015. Community based reproductive health interventions for young married couples in resource-constrained settings: A systematic review. *BMC Public Health* 15(1):1-19.

Schwandt, H, Skinner, J, Hebert, L, Cobb, L, Saad, A & Odeku, M. 2017. Inadequate birth spacing is perceived as riskier than all family planning methods, except sterilization and abortion, in a qualitative study among urban Nigerians. *BMC Women's Health* 17(1):1-9.

Singh, A, Singh, K & Verma, P. 2016. Knowledge, attitude and practice GAP in family planning usage: An analysis of selected cities of Uttar Pradesh. Contraception and *Reproductive Medicine* 1(1):1-10.

Smedley, J, Jancey, J, Dhaliwal, S, Zhao, Y, Montero, S & Howat, P. 2014. Women's reported health behaviours before and during pregnancy: A retrospective study*. Health Education Journal* 73(1):28-40.

Sopheab, H, Tuot, S, Chhea, C & Gorbach, P. 2015. Characteristics, risk behaviours and factors associated with abortion among female entertainment workers in Cambodia. *Reproductive Health* 12(1):1-8.

Speizer, I & Lance, P. 2015. Fertility desires, family planning use and pregnancy experience: longitudinal examination of urban areas in three African countries. *BMC Pregnancy and Childbirth* 15(1):1-13.

Sridhar, A & Salcedo, J. 2017. Optimizing maternal and neonatal outcomes with postpartum contraception: impact on breastfeeding and birth spacing. *Maternal Health Neonatology and Perinatology* 3(1):1-10.

Steel, A, Lucke, J & Adams, J. 2015. The prevalence and nature of the use of preconception services by women with chronic health conditions: an integrative review. *BMC Women's Health* 15(1):1-12.

Stotland, N. 2010. Mental health aspects of women's reproductive health: A global review of the literature by the World Health Organization; Geneva, Switzerland, WHO Press, 2009, 170 $30. *Psychiatric Services* 61(4):421-421.

Squiers, L, Mitchell, E, Levis, D, Lynch, M, Dolina, S, Margolis, M, Scales, M & Kish-Doto, J. 2013. Consumers' perceptions of preconception health. *American Journal of Health Promotion,* 27(sp3):S10-S19.

Swaleh, R, Zeng, L, Mbuagbaw, L & Morrison, K. 2015. Outcomes in the offspring of mothers with pre-diabetes during pregnancy: a protocol for a systematic review. *Systematic Reviews* 4(1):1-5.

Taha, T, Dedabhai, S, Rahman, M, Sun, J, Kumwenda, J & Kumwenda, N. 2012. Trends in birth weight and gestational age for infants born to hiv-infected, antiretroviral treatment-naive women in Malawi. *The Pediatric Infectious Disease Journal* 31(5):481-486.

Tamang, L, Raynes-Greenow, C, McGeechan, K & Black, K. 2017. Factors associated with contraceptive use among sexually active Nepalese youths in the Kathmandu Valley. *Contraception and Reproductive Medicine* 2(1):1-8.

Temel, S, Erdem, Voorham, T, Bonsel, G, Steegers, E & Denktaş, S. 2015. Knowledge on preconceptional folic acid supplementation and intention to seek for preconception care among men and women in an urban city: a population-based cross-sectional study. *BMC Pregnancy and Childbirth* 15(1):1-11.

Tilahun, F, Dadi, A & Shiferaw, G. 2017. Determinants of abortion among clients coming for abortion service at felegehiwot referral hospital, northwest Ethiopia: a case control study. *Contraception and Reproductive Medicine* 2(1):1-6.

Tjoa, C, Pare, E & Kim, D. 2010. Unipolar depression during pregnancy: nonpharmacologic treatment options. *Women's Health* 6(4):565-576.

Tuomainen, H, Cross-Bardell, L, Bhoday, M, Qureshi, N & Kai, J. 2013. Opportunities and challenges for enhancing preconception health in primary care: qualitative study with women from ethnically diverse communities. *BMJ Open* 3(7):1-9.

United Nations Children Fund (UNICEF) US. 2015. Maternal and Newborn health Disparities, Malawi.
[Online]. Available at:
https://data.unicef.org/wpcontent/uploads/country_profiles/Malawi/country%20profile_MWI.pdf (accessed 25 March 2018).

Vallely, L, Homiehombo, P, Kelly-Hanku, A & Whittaker, A. 2015. Unsafe abortion requiring hospital admission in the Eastern Highlands of Papua New Guinea - A descriptive study of women's and health care workers' experiences. *Reproductive Health* 12(1):1-11.

Van den Broek, N, Jean-Baptiste, R & Neilson, J. 2014. Factors associated with preterm, early preterm and late preterm birth in Malawi. *PLoS ONE* 9(3):1-8.

Van Dijk, M, Oostingh, E, Koster, M, Willemsen, S, Laven, J & Steegers-Theunissen, R. 2017). The use of the mHealth program Smarter Pregnancy in preconception care: rationale, study design and data collection of a randomized controlled trial. *BMC Pregnancy and Childbirth* 17(1):1-7.

Vinturache, A, Moledina, N, McDonald, S, Slater, D & Tough, S. 2014. Pre-pregnancy Body Mass Index (BMI) and delivery outcomes in a Canadian population. *BMC Pregnancy and Childbirth* 14(1):1-10.

Waggoner, M. 2012. Motherhood preconceived the emergence of the preconception health and health care initiative. Journal of Health Politics, Policy and Law 382:345-371.

Wahabi, H, Alzeidan, R, Bawazeer, G, Alansari, L & Esmaeil, S. 2010. Preconception care for diabetic women for improving maternal and foetal outcomes: a systematic review and meta-analysis. *BMC Pregnancy and Childbirth* 10(1):1-14.

Wang, Y, Cao, Z, Peng, Z, Xin, X, Zhang, Y, Yang, Y, He, Y, Xu, J & Ma, X. 2015. Folic acid supplementation, preconception body mass index, and preterm delivery: findings from the preconception cohort data in a Chinese rural population. *BMC Pregnancy and Childbirth* 15(1):1-9.

Weisman, C, Hillemeier, M, Downs, D, Feinberg, M, Chuang, C, Botti, J & Dyer, A. 2011. Improving Women's Preconceptional Health: Long-term effects of the strong healthy women behavior change intervention in the central Pennsylvania women's health study. *Women's Health Issues* 21(4):265-271.

Whirtworth, M & Dowswell T. 2015. *Routine pregnancy health promotion for improving pregnancy outcome. Cochrane Database Systematic Review PMC*. [Online]. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4164828/pdf/emss-58079.pdf (accessed 13 October 2017).

World Health Organization. 2013. *Preconception care, Maximizing the gains for maternal andchildhealth*.[online].Availableat:http://www.who.int/maternal_child_adolescent/documents/preconception_care_policy_brief.pdf (accessed 23 March 2018).

World Health Organization. 2015a. *WHO/Maternal mortality*. [Online].
Available at:
http://www.who.int/gho/maternal_health/mortality/maternal_mortality_text/en/ (accessed 14 February 2015).

World Health Organization. 2015b. *Advocacy presentation: What is HTSP, basic healthy timing and spacing of pregnancy toolkit*. [Online].
Available at: http://www.who.int/pmnch/topics/maternal/htsp101.pdf (accessed 14 February 2015).

Wilunda, C, Oyerinde, K, Putoto, G, Lochoro, P, Dall'Oglio, G, Manenti, F, Segafredo, G, Atzori, A, Criel, B, Panza, A & Quaglio, G. 2015. Availability, utilisation and quality of maternal and neonatal health care services in Karamoja region, Uganda: A health facility-based survey. *Reproductive Health* 12(1):1-11.

Yakoob, M, Menezes, E, Soomro, T, Haws, R, Darmstadt, G & Bhutta, Z. 2009. Reducing stillbirths: behavioural and nutritional interventions before and during pregnancy. *BMC Pregnancy Childbirth* 9(Suppl 1):1-34.

Yang, N, Wroth, S, Parham, C, Strait, M & Simmons, L. 2013. Personalized health planning with integrative health coaching to reduce obesity risk among women gaining excess weight during pregnancy. *Global Advances in Health and Medicine*:1-6.

Yekta, Z, Ayatollahi, H, Porali, R & Farzin, A. 2006. The effect of pre-pregnancy body mass index and gestational weight gain on pregnancy outcomes in urban care settings in Urmia-Iran. *BMC Pregnancy and Childbirth* 6(1):1-8.

You, X, Tan, H, Hu, S, Wu, J, Jiang, H, Peng, A, Dai, Y, Wang, L, Guo, S & Qian, X. 2015. Effects of preconception counselling on maternal health care of migrant women in China: A community-based, cross-sectional survey. *BMC Pregnancy and Childbirth* 15(1):I-10.

Young, C Urquia, M, & Ray, J. 2013. Preconception care in low- and middle-income countries: *New opportunities and new metric. PLoS Med* 10(9):1-3.

Zhou, Q, Zhang, S, Wang, Q, Shen, H, Tian, W, Chen, J, Acharya, G & Li, X. 2016. China's community-based strategy of universal preconception care in rural areas at a population level using a novel risk classification system for stratifying couples' preconception health status. *BMC Health Services Research* 16(1):1-7.

ANNEXURES

ANNEXURE 1

QUESTIONNAIRE TO DETERMINE THE INFORMATION ON CARE GIVEN ON:

TIME TAKEN TO COMPLETE THE QUESTIONNAIRE

SECTION A: DEMOGRAPHIC DATA:

1. **How old are you?** ***Kodi muli ndi zaka zingati?***

AGE	**Code**
18- 19 years	1.
20 – 30 years	2.
31- 40 years	3.
41- 50 years	4.

2. **When were you born:** ***Kodi munabadwa liti?***

Date		**Month**		**Year**			

3. **What is your sex?** ***Kodi ndinu mwamuna kapena mkazi?***

Sex	**Code**
Male	1
Female	2

4. **Marital status?** ***Kodi muli pa banja?***

Marital Status	**Code**
Married	1
Single	2
Engaged	3
Divorced	4
Widow	5
Other, specify	6

5. **Tribe/ethnic background:** ***Kodi ndinu a mtundu wanji?***

Tribe/Ethnicity	**Code**
Chewa	1
Tumbuka	2
Ngoni	3
Lomwe	4
Yawo	5
Other, Specify	6

6. Home District: ***Kodi mumachokera boma liti?***

District	**Code**
Blantyre	1
Chiradzulo	2
Thyolo	3
Mulanje	4
Other specify	5

7. **What is the highest education qualification you have achieved?**
Kodi sukulu munafika nayo pati?

Highest achieved certificate	**Code**
University degree	1
College/Professional degree	2
Diploma	3
Secondary school	4
Primary school	5
None	6

8. **What is your religion?** ***Kodi ndinu a mpingo wanji?***

Religion	Code
Roman Catholic	1
Presbyterian	2
Seventh Day Adventist	3
Pentecostal	4
Muslim	5
Other, specify	6

9. **What is your occupation/profession?** ***Kodi mumagwira ntchito yanji?***

Occupation	Code
Teacher	1
Nurse	2
Farmer	3
Business man	4
Unemployed	5
Other, specify	6

SECTION B: PSYCHOLOGICAL PREPARATION BEFORE CONCEPTION:

10. **Are you planning to get pregnant?**
Kodi mukufuna kukhala ndi pakati/mimba*?*

Planning for pregnancy	**Code**
Yes	1
No	2

11. **When do you intend to get pregnant?**
Kodi mukuyembekezera kukhala ndi pakati/mimba liti?

Years	**Code**
1 to 2	1
3 to 4	2
5 to 6	3
More than 6	4

12. **Have you been given any information to assist you have a healthy pregnancy?**
Kodi munalandirapo uphungu wokuthandizani kuti mukhale anthanzi nthawi yomwe muli ndi mimba?

Information for pregnancy	**Code**
Yes	1
No	2

13. **Did you go to the hospital to be examined/get information before getting pregnant?**
Kodi munapita ku chipatala kuti akuyezeni muli ndi mimba?

Went to hospital	Code
Yes	1
No	2

14. **What information have you been told to have a healthy pregnancy?**
Nanga ndi uphungu wotani womwe munauzidwa kuti mukhale anthanzi nthawi yomwe munali ndi mimba?

Kind of information	Code
Eating balance meals	1
Screened from chronic diseases	2
Screened from STIs	3
Screened from HIV AIDS	4
Haemoglobin content check	5
Emotional preparation for pregnancy	6

15. **Did you seek any care as you planned for the pregnancy before conception?**
Kodi munapitapo ku chipatala kuti mukalandire uphungu pamene mukafuna kutenga pakati?

Went to hospital	Code
Yes	1
No	2

16. **Was your pregnancy planned?**
Kodi mimba ya ulendo wathawu inali yokonzekera?

Planned pregnancy	Code
Yes	1
No	2

17. **Were you ready to take care of your pregnancy?**
Kodi munali wokonzekera kusamalira mimba yanu?

Readiness for pregnancy	Code
Yes	1
No	2

18. **Were you psychologically prepared to take care of your pregnancy**?
Kodi munakonzekera mumaganizo mwanu kukhala woyembekedzera?

Psychologically prepared	Code
Yes	1
No	2

19. **Is your partner prepared to support you during this pregnancy?**
Kodi amuna anu ndi wokonzekera kukuthandizani pamene muli oyembekedzera?

Went to hospital	Code
Yes	1
No	2

20. **What preparations did you do to have a healthy outcome of the baby and the mother?**
Nanga ndi uphungu wotani womwe munauzidwa kuti mukhale anthanzi nthawi yomwe munali ndi mimba?

Preparations for a healthy baby	Code
Medical attention	1
Laboratory investigations hb,STIs,HIV/AIDS	2
Care for pregnancy	3
Delivery place	4
Transport to the hospital	5
Birth companion	6
Resources for birth	7

21. Did you have enough income to support you as you plan for pregnancy?
Kodi munakonzekera ndalama zokwanira kuti zikuthandizeni pamene muli woyembekezera?

Enough money	**Code**
Yes	1
No	2

22. Did you have a supportive relationship with your partner?
Kodi akazi anu kapena amuna anu amakuthandizani pamene munali woyembekezera?

Supportive partner	**Code**
Yes	1
No	2

23. Did you discuss plans on how you will care for the pregnancy with your partner?
Kodi munakambirana momwe muzathandizirane ndi amuna anu kapena akazi anu nthawi yomwe munali ndi mimba?

Discussed plans	**Code**
Yes	1
No	2

24. What role will your partner play as you planned to have the pregnancy? (For female only)
Kodi ndi udindo wanji umene amuna anu anali nawo pamene munali odwala? (Funso la mayi okha)

PARTNER'S ROLE	**Code**
Provide emotional support	1
Resource provider	2
Assist with house hold chores	3

SECTION C: REPRODUCTIVE HEALTH DATA: FAMILY PLANNING & HEALTH TIMING AND SPACING OF PREGNANCY

25. How many times have you ever been pregnant?
Kodi mwakhalapo ndi mimba kangati?

Number of times been pregnant	Code
1 to 2	1
3 to 4	2
5 to 6	3
7 to 8	4
More than 8	5

26. **How many children are alive?** ***Muli ndi ana angati amoyo?***

Number of alive children	Code
1 to 2	1
3 to 4	2
5 to 6	3
7 to 8	4
More than 8	5

27. **Do you want to get pregnant again?** ***Kodi mukufuna kukhala ndi mimba/pakati posachedwa?***

Pregnant again	Code
Yes	1
No	2

28. If yes, when?
If yes, mukufuna kukhala ndi mimba litilo?

When to be pregnant again	Code
Currently	1
6months to 1 year	2
2 to 3 years	
5 to 4 years	
more than 5 years	

29. Have you had sex with a man/woman the last 6 months?
Kodi mwagona limodzi ndi mwamuna miyezi isanu ndi umodzi yapitayo?

Sex within last 6 months	Code
Yes	1
No	2

30. During your last sex encounter, did you use condoms when you last had sex?
Pemene munkagonana pomalizapa, kodi munagwiritsa ntchito kondomu?

Used a condom during last sex	Code
Yes	1
No	2

31. Did you use any family planning method?
Kodi munagwiritsa njira ya kulera ili yonse?

Any contraception method used	Code
Yes	1
No	2

32. What methods of family planning did you use or you are using?
Ndi njira ziti za kulera zomwe Munagwiritsa ntchito? (multiple response)

Method of contraception used	Code
None	1
Pills	2
IUD	3
Depo-Provera	4
Implant	5
Sterilization tubes	6
Other, Specify	7

33. Would your partner like more information about planning pregnancy? ***Kodi amuna anu angafune kudziwa zambiri za kulera?***

Partner information	Code
Yes	1
No	2

34. Do you know some of the benefits of using family planning methods?
Kodi mukudziwa ubwino wanji wogwiritsa njira za kulera?

BENEFITS	Code
Mother has good health before pregnancy	1
Baby grows well with enough care	2
Income of the home is saved	3
Responsibilities to care for more is reduced	4
Productivity for an individual is more	5
Social services are enough in a country	6

35. How long did it take before you had another pregnancy?
Panapita nthawi bwanji musanaime mimba ina?

Waiting time between pregnancy	Code
Less than a year	1
2 to 3 years	2
4 to 5 years	3
more than 5 years	4

36. Do you know the recommended healthy timing and spacing of pregnancy?
Kodi mukudziwa nthawi yoyenera kudikira musanatenge mimba ina?

Healthy timing and spacing for pregnancy	Code
1 year	1
2 years	2
3 years	3
4 years	4
5 years	5
More than 5 years	6

37. What is the recommended time to have another pregnancy after one has had an abortion?
Kodi mayi akakhala ndi nthayo ayenera kudikira zaka zingati asanaime mimba?

Recommended time after abortion	Code
6 months	1
1 year	2
2 years	3
3 years	4
4 years	5
5 years	6

38. What is the recommended time to have another pregnancy after the death of a child soon after birth?
Kodi mwana akabadwa opitirira mayi ayenera kudikira nthawi yokwanira bwanji asanatenge mimba yina?

Recommended time after stillbirth	Code
6 months	1
1 year	2
2 years	3
3 years	4
4 years	5
5 years	6

SECTION D: RISK ASSESSMENT BEFORE CONCEPTION: Medical and surgical conditions, nutrition, infectious diseases, immunizations and prevention of drugs in pregnancy

39. **Have you been to any health care service to be accessed on the following conditions that would affect your pregnancy?**
Kodi munapita kuka yezetsa matenda osiyasiyana omwe angapangitse mwana kudwala monga awa?

Condition affecting pregnancy	Code
Respiratory problems	1
Cardiac disease	2
hypertension	3
Anaemia	4
Malnutrition	5
Abdominal surgery	6
Gynaecological problem	7
Reproductive health	8
Diabetes	9

40. **Were you assessed nutritionally to determine the level of the Body Mass Index before getting pregnant?**
Kodi anakuyezani kukura kwa thupi lanu ndi msinkhu wanu musanakhale ndi mimba?

Assessed nutritionally	Code
Yes	1
No	2

41. **Have you heard any messages that provide advice on how to stay health before conception?**
Kodi munamvapo za uthenga othandiza kuti amayi ndi abambo akhale athanzi nthawi yomwe afuna kukhala ndi mimba?

Heard messages that provide advice	Code
Yes	1
No	2

42. Where did you get the message?
Kodi munamvapo kuchokera kuti?

Access of information	Code
Radio	
Television	
Antenatal clinic	
Hospital	
Church	

43. **What messages did you get?** ***Kodi munalandira uthenga wanji?***

Message received	Code
Good health before conception	1
Laboratory test for HB, STIs, Blood group. HIV/AIDs	2
Planned pregnancy	3
Healthy Timing and spacing of pregnancy	4
Preparation for a healthy pregnancy	5

44. Did you get any advice to improve your health before conception with the following medications?
Kodi munalandira uphungu wotani kuti thanzi lanu likhale labwino musanabereke? Munalandira mankhwala alembedwawa?

Advice to improve health before contraception	Code
Folic acid	1
Ferrous sulphate	2
Fansidar	3
Multivitamins	4
Immunizations	5
Other Specify	6

45. **Were you provided to do the following investigations before you get pregnant at your health facility to have a healthy mother and baby?**
Kodi munayezedwa zotsatirazi musanakhale ndi mimba kuti mayi ndi mwana akhale athanzi?

Investigations before getting pregnancy	Code
Full Blood Count	1
Blood group	2
Malaria parasites	3
VDRL	4
HIV	5
Cervical cancer	6

46. What type of vaccines did you get before becoming pregnant for you to have a healthy outcome of the mother and the baby?
Kodi munalandira katemera wanji musanakhale woyembekezera kuti inu ndi mwana wanu atetedzedwe ku matenda?

Type of vaccines before pregnancy	Code
Tetanus Toxoid Vaccine	1
Cancer of the cervix	2
Pneumonia vaccine	3
None	4

SECTION E: SCREENING FROM HOME, WORK, GENETIC and SOCIAL HAZARDS

47. Is your home near factories or any hazardous area?
Kodi nyumba yanu ili pafupi ndi zinthu zoopsya kumoyo wa anthu monga ma fakitale otulutsa utsi?

Home near factory	Code
Yes	1
No	2

48. **Are you in contact with chemicals like fertilizer, insecticides within the time you will be pregnant?**
Kodi mumakhuzana ndi mankwhala ngati feteleza kapena ophera zilombo nthawi yomwe muli odwala?

Contact with chemicals	Code
Yes	1
No	2

49. **Do you know of any medications that could cause harm to the foetus during conception?**
Kodi mukudziwa za mankhwala amene angapweteke mwana wanu pamene ali mmimba?

Medication to harm foetus	Code
Yes	1
No	2

50. **Were you and your partner counselled on genetics to anticipate a healthy baby?**
Kodi munakambirana ndi azachipatala pamatenda omwe mwana oyembekedzera angatengere matenda omwe ali kuaanja anu kapena achibadwide chanu?

Counselled on genetics	Code
Yes	1
No	2

51. **Were you counselled on how to get the preferred sex you want to have as a pregnancy outcome? Kodi anakuuzani momwe mungapezere mwana wamamuna kapena wa Mkazi ndi makonda anu?**

Counselled on preferred sex pregnancy outcome	Code
Yes	1
No	2

52. Were you provided with information regarding genetics that can influence the outcome of your pregnancy?
Kodi munafunsidwa kulingana ndi chibadwa chanu ndi akazi anu kapena amuna anu momwe kubereka kungakhalire kulingana ndi mbiri ya zinthu izi?

Information about genetics	Code
Yes	1
No	2

53. Were you asked the genetically factors that are inherited from yourself and your partner that would influence the outcome of the pregnancy like:
Kodi munaudzidwa momwe chibadwa chanu ndi akazi anu kapena amuna anu chingapangise kukhala ndi mayi ndi mwana wathanzi pobereka?

Genetically inherited factors that affect the pregnancy outcome	Code
Multiple gestation	1
Diabetes	2
Rh factor	

54. Do you know that drugs taken during conception that could cause harm to the foetus?
***Kodi* mukudziwa za mankwhala amene atha kupangitsa mwana wobadwa kukhala ndi zilema zobadwa nazo?**

Drugs taken during pregnancy	Code
Yes	1
No	2

55. Have you been informed of any drugs that could affect foetal development?
Kodi mukudziwa za mankhwala omwe angapangitse zilema kwa mwana ali mmimba mwa amayi ake?

Any drugs that could affect the foetus development	Code
Yes	1
No	2

56. How much alcohol do you take in a month?
Kodi mumamwa mowa wa mulingo ungati pamwezi?

Amount of beers taken/consumed in a month	Code
A little	1
Moderate	2
Too much	3
None	4

57. What kind of tobacco do you smoke?
Kodi mumasuta fodya wanji?

Heard messages that provide advice	Code
Local	1
Cigarettes	2
Nose sniff	
Do not smoke	

Thank you very much for your time.

ANNEXURE 2

PERMISSION TO USE THE TOOLS USED IN TEXAS

Dieula Delissaint Tchoualeu, PhD MPH
Lawrenceville, GA 30046

July 15th, 2016

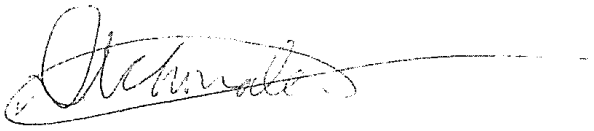
Alice Kadango
Kamazu College of Nursing
Blantyre, Malawi

Subject: Permission to use data collection instruments used in study on preconception care

This letter authorizes Ms. Alice Kadango to use the same instrument (s) that was used for my dissertation study on preconception care in 2008. Ms. Kandango can modify the instrument (s) based on country and/or cultural context.

If you have any questions, please do not hesitate to contact me at Dieula.Delissaint@gmail.com.

Thanks, and regards,



Dieula Delissaint Tchoualeu

ANNEXURE 3

CRITERIA OF THE RESPONDENTS IN A STUDY DONE IN TEXAS

84

Are you a woman between 18-35 years old who has never given birth before?

Are you planning to get pregnant within the next five years?

If so, you are invited to join a research study to examine health behaviors that women engage in before pregnancy.

If you:

- Are a woman living in the Bryan/ College Station area
- Are between 18 and 35 years of age
- Do not have any children, but *do* intend to conceive within the next 5 years.

We would like to hear your feelings, beliefs and knowledge about what a woman should do for her health before pregnancy.

Each participant will receive a $25 gift for participating

All information will be kept strictly Confidential

For more information or to sign up contact:

(979) 845-3290

ANNEXURE 4

QUESTIONNAIRE ADAPTED FOR A STUDY DONE IN TEXAS

DEMOGRAPHIC INFORMATION

1. What is your age?
   A. _____years

2. What is your marital status?
   A. Single, never been married
   B. Single, cohabitating
   C. Married
   D. Divorce
   E. Separated
   F. Widowed
   G. Other (Please specify) _____

3. Please indicate your race / ethnicity (circle all that apply)
   A. Caucasian / White
   B. Black / African American
   C. Hispanic / Latino
   D. Asian
   E. Native American / Alaska Natives
   F. Native Hawaiian and other Pacific Islanders
   G. Other (Please specify) _____

4. Please indicate your religious affiliation
   A. Catholic
   B. Christianity
   C. Judaism
   D. Muslim
   E. Other (please specify) _____

5. What is the highest grade of school or year of college have you completed?
   A. Less than High School
   B. High School/ Diploma/GED
   C. Some College
   D. 2-year College Degree (Associates)
   E. 4-year College Degree (B.A., B.S.)
   F. Master's Degree
   G. Doctoral Degree
   H. Professional Degree (MD., JD.)
   I. Trade / Vocational Degree
   J. Other (please specify) _____

6. Which of the following best describes your annual income?
   A. No income
   B. Less than $15,000
   C. $15,000 to $29,999
   D. $30,000 to $44,999
   E. $45,000 to $59,999
   F. $60,000+

7. What is your current occupation?
   A. Student
   B. Homemaker
   C. Management (business, financial operations, and sales/service management)
   D. Professional (architectural, computer & mathematical, engineering, life sciences, social & behavioral sciences, legal occupations, education, health diagnostics and treatment)
   E. Service (healthcare support, protective service, food preparation, maintenance, personal care).
   F. Sales (retail sales, representatives, travel agents)
   G. Administrative (financial clerks, information/records clerks, office administrative support).
   H. Farming (agricultural workers, fishers, forest/logging and conservation workers)
   I. Construction Trades (carpenters, drywall installers, sheet metal workers)
   J. Installation (electrical/electronic installer & repairs, vehicle mechanics, appliance installation & repairs).
   K. Production (assemblers/fabricators, food processing, printing, plant & system operators)
   L. Transportation (motor vehicle operators, rail & water transportation)
   M. Military/Armed Forces
   N. Unemployed
   O. Other (please specify) _____

Preconception Health Behaviors

8. Do you intend (plan) to have a baby within…?
   A. The next 6 months
   B. The next 12 months
   C. The next 2 years
   D. The next 5 years

9. Do you currently perform any of the followings? (circle all that apply)
   A. Smoke
   B. Exercise
   C. Binge drink
   D. Street (illicit) Drug use
   E. Contraceptive use / Birth control

F. Condom use
G. Folic acid intake
H. Daily fruit and vegetable consumption
I. Other (please specify) _____

10. Do you have any of the following health problems? (circle all that apply)
    A. Weight Problem
        i. Underweight
        ii. Overweight
    B. Eating disorders
        i. Anorexia
        ii. Bulimia
    C. Heart disease
    D. Diabetes
    E. High blood pressure
    F. High cholesterol
    G. None of the above
    H. Other (please specify) _____

11. Have you ever been diagnosed with any of the following sexually transmitted infections? (circle all that apply)

    A. Chlamydia
    B. Genital Herpes
    C. Gonorrhea
    D. Hepatitis
    E. HIV/AIDS
    F. HPV (Human Papillomavirus)
    G. Syphilis
    H. None of the above
    I. Other (please specify) _____

12. How many times have you gone last year to visit a physician?
    A. Once a year
    B. Twice a year
    C. Once a month
    D. As frequently as necessary

13. How may times have you gone last year to see a dentist?
    A. 0
    B. 1
    C. 2
    D. 3+
14. How many Pap smear have you had in last year?
    A. 0
    B. 1

C. 2
D. 3+

15. Have you taken any of the following drugs within the last 6 months? (circle all that apply)
    A. Cocaine
    B. Accutane
    C. Captopril
    D. Lithium
    E. Corticosteroids
    F. Phenobarbitol
    G. Thalidomide
    H. Valproic acid
    I. None of the above
    J. Other (please specify) _____

INTERVIEW QUESTIONS

Belief/Perception/knowledge

1. What is pre-conception care? What comes to mind when you think of "pre-conception care"?
2. What is pre-conception health? What does pre-conception health include?
3. How did you hear about PC? Where do your get your source of information?
4. How do you feel about pre-conception care?
5. Why do you think PCC is important?
6. When do you think a woman should start pre-conception care?
7. What is the difference between preconception care vs. prenatal care?
8. What type of discussion do you have with your doctor regarding preconception care?
    a. Have you talked to your doctor about birth control practices?
9. Do you seek out information that will help you? If so, Where?
10. What is your thought on "building your house first before becomes pregnant"?
11. Why do you think a woman should be tested for STI? Have you been tested for STI?

Intention

12. When do you plan to start engaging in pre-conception care?
13. What is your plan toward preconception health behavior?
14. What makes you start thinking about preconception care or contemplating preconception care?

Decision-making toward preconception health

15. What makes you start thinking about preconception care or contemplating about preconception care?

16. What type of action are you currently taking to engage in preconception health behavior?
17. What factors facilitate your decision (or to act) to preconception health behavior?
18. What factors motivate you to engage in self-care prior to conception?
19. What prevent you from focusing on taking care yourself?
20. What role do your family and peers play in your current health behaviors?
21. What could help you engage in or maintain your preconception health practice (s)?
22. How does your faith or your spirituality influence your decision to engage (or not) in preconception health behaviors?

ANNEXURE 5

CRITERIA OF PARTICIPANTS IN THE STUDY

INCLUSION CRITERIA FOR PARTICIPANTS

Are you a man /woman between 18 to 35 years old with a child?

Are you intending to get pregnant in the next 5 years to come?

You can speak Chichewa/ English?

If so, you are invited to join in a research study to contribute your knowledge and views on preconception care (PCC).

If you:

- Are a man /woman living in **Ndirande, Limbe** and **Mpemba**
- Are between **18 and 35 years of age**
- Have at least **one child or more** but do intend to **conceive within the next 5 years**

We would like to hear your knowledge and views about what a woman/man should do for her/his health before pregnancy

For more information or to sign up

Contact: 265 0 995790354

ANNEXURE 6
INFORMATION FOR CONSENT FORM FOR PARTICIPANTS

ANNEXURE 6.1
ENGLISH VERSION FOR INFORMATION FOR CONSENT FORM

DEVELOPMENT OF RELEVANT PRECONCEPTION INTERVENTIONS/STRATEGIES TO IMPROVE MATERNAL AND NEWBORN OUTCOME IN BLANTYRE URBAN, MALAWI

Dear Participant

My name is Alice Kadango, a lecturer at Kamuzu College of Nursing, currently a PhD student at University of South Africa. I am conducting a research study on the title above.

This is to inform you that I would like you to participate in a research study on "the development of relevant preconception interventions/strategies to improve maternal and newborn outcome in Blantyre urban, Malawi".

The study will investigate the PCC that is provided in Malawi and identify other relevant interventions that would improve maternal and newborn health in Malawian context. The information will assist to develop appropriate policies or strategies that would be put in place to increase awareness and use of PCC in Malawi. The information will assist the health care providers to reinforce the appropriate interventions that would assist women and men of the childbearing age to prevent complications of pregnancies.

You have been selected to participate in the study because you are a man or woman of childbearing age between 18 to 35 years old and there is potential that you are planning to get pregnant soon. You should not have done bilateral tubal ligation if you are a woman and not have done vasectomy if you are a man.

You will be involved if you are willing to provide information that you know on preparation to conception. You are able to choose to participate in the study or not. You may withdraw from participating at any time you feel so and there will be no penalty.

The study will follow procedures approved by the appropriate research committees from University of South Africa, College of medicine of Malawi and Queen Elizabeth Central Hospital.

There are no risks anticipated if you participate in the study and you are free to choose the questions you want to respond to or you are comfortable to provide the information. The researcher will provide a developed pamphlet on information on PCC for you to benefit.

The procedure will involve a research interviewer who will ask questions from a structured questionnaire that would take about 30 to 40 minutes. Both audio and visual privacy will be maintained at all times. The questionnaire is anonymous and information will be confidential and kept at a secure place by the researcher.

You are free to choose to participate in the study and refusal to take part involves no penalty or loss of benefits. You are allowed to discontinue participating in the study at any time without loss of benefits.

Findings of the study will be accessible to you for your benefit.

You are free to ask for clarity of any information regarding the research whenever necessary to the following:

Alice Kadango, Kamuzu College of Nursing, P.O Box 415, Blantyre, Malawi. Telephone number+ 265(0) 995790354, Email address: alicekadango@kcn.unima.mw

COMREC Secretariat, University of Malawi, College of Medicine and Research and Ethics Committee, Private Bag 360, Chichiri, Blantyre 3 Telephone number + 265 (0) 1871911 Email address comrec@medcol.mw

Thank you for considering participating in the study

Yours A. Kadango Mrs.

ANNEXURE 6.2

CHICHEWA VERSION OF INFORMED CONSENT

CHIKALATA CHODZIWITSA ANTHU AMENE ATATENGE MBALI PA KAFUKUFUKU

DEVELOPMENT OF RELEVANT PRECONCEPTION INTERVENTIONS/STRATEGIES TO IMPROVE MATERNAL AND NEWBORN OUTCOME IN BLANTYRE URBAN, MALAWI

Wokondeka Wotenga nawo mbali pa Kafukufuku

Dzina langa ndine Alice Kadango ndipo ndimagwira ntchito yosula azamba ku Sukulu ya a zamba ku Kamuzu. Pakadali pano ndiri pa Sukulu ya ukadaulo ku yunivesite ya ku South Africa. Ndikupanga kafukufuku wofuna kwa amayi kapena abambo.

Mukupephedwa kutenga nawo mbali mukafukufuku wofuna kupeza mfundo zomwe zingathathandize kuti tipeze ndondomeko zomwe a chipatala angatsatile kuti atithandize ndi uphungu wokwanira tisanaime mimba kuti zotsatira za kukhala oyembekedzera tidzakhale ndi mayi ndi mwana wathanzi ndiponso kuti tichepese imfa zomwe zimabwera chifukwa chobereka kwa amayi ndi ana.

Kafukufuku azafufudza za uphungu omwe amayi ndi a bambo amalandira kuno ku Malawi akamafuna kukhala woyembekedzera ndiponso kupeza uphungu womwe anthu angalandire nthawi yomwe ali woyembekedzera kuti tikhale mayi ndi mwana wa thanzi kuno kwathu ku Malawi. Zotsatira za Kafukufuku zizatithandidza kuti tipeze uphungu wofunikira omwe tiyenera kulandira ku chipatala tisanakhale woyembekedzera kuti tipewe imfa za amayi ndi ana nthawi yobereka.

Inuyo mwasankhidwa kutenga nawo mbali mukafukufukuyi chifukwa Ndinu amayi kapena abambo oyenera kukhala woyembekedzera nthawi ili yonse ndipo Ndinu a zaka zokwanira 18 ndi 35. Amayi azakhale kuti anatseka chiberekero ndipo abambo akhale asanapangidwe mudulidwe opangitsa iwo kusabeleka.

Mutenga nawo mbali mukafukufuku ngati mwabzomeredza kuti mupereke umboni za momwe Munakonzekera kapena kulandira uphungu musanakhale woyembekedzera. Muli ndi ufulu kutenga nawo mbali kapena otsatenga nawo mbali pa zifukwa zomwe inu mukudziwa. Muthanso kusiya kutenga nawo mbali pa nthawi ili yonse ndipo palibe chomwe chilango chilirichonse chomwe chidzachitike kwa inu.

Kafukufuku asanapangidwe wotsogolera kafukufuku azatenga chiloledzo kuchokera ku College of Medicine Research Committee (COMREC) komwe ndi komiti yoyang'anira za Kafukufuku aliyense amapangidwa ku Malawi kuno. Chiloledzo chidzachokanso ku Sukulu yaukachenjede ya ku South Africa, Queen Elizabeth Central Hospital ndiponso ku zipatala zazing'ono za Ndirande, Zingwangwa ndi Limbe.

Palibe zobvuta zomwe mutadzakumane nazo chifukwa chotenga nawo mbali mukafukufuku amaneyu. Mafunso omwe mukuona kuti simungayankhepo kanthu mutha ku walumpha. Uthenga woyenera ku maanja omwe akufuna kuzakhala woyembekezera uzapatsidwa kwa inu kuti mukhale ndi uthenga oyenera.

Kafukufukuyi azatha kukhala ndi chofunsira Mafunso chomwe Inuyo ngati mungathe kuwerenga mutha kuyankha nokha. Ngati simutha kulemba ndi werenga Mafunso azafunsidwa ndi kalembera wa kafukufuku. Kufunsa Mafunso kapena kuyankha kuzatenga mphindi makumi atatu kapena anayi.

Wina sazatha kukuonani kapena kumva kuti mukutenga mbali pa kafukufuku chifukwa malo ake adzakhala obisika bwino ndithu. Chofunsira Mafunso sipadzalembedwa dzina lililonse la amene akutenga nawo mbali pa kafukufuku. Zomwe muzayankhe zizasungidwa bwino pa malo obisa kuti aliyense asaone zomwe inu mwayankha.

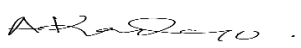
Ndinu omasuka kutenga nawo mbali mukafukufuku amaneyu kapena kusiya pa zifukwa zanu. Sipazakhala mulandu uli onse mukatero koma mudzatha kulandira chilichonse choyenera kupatsidwa kwa inu.

Ndinu omasuka Kufunsa pamene Mukufuna kumvetsetsa Kwa anthu awa:

Alice Kadango, Kamuzu College of Nursing, P.O Box 415, Blantyre, Malawi. Telefoni nambala +265 (0) 995790354, Email address: alicekadango@kcn.unima.mw

A lembi, University of Malawi, College of Medicine and Research and Ethics Committee, Private Bag 360, Chichiri, Blantyre 3 Telefone nambala +265 (0) 1871911 Email address comrec@medcol.mw

Thank you for considering participating in the study.



Yours A. Kadango Mrs.

ANNEXURE 7

CONSENT FORM FOR PARTICIPANTS IN ENGLISH

I understand that I will be part of a research study focusing on "development of interventions and strategies on preconception care (PCC) to improve neonatal outcome in Malawi. I understand that the information obtained will be used to improve men and women utilisation of PCC in order to improve maternal and neonatal outcome.

I willingly give consent to be interviewed to provide information on how PCC is provided in Malawi so that there can be improvement in the care to assist to improve maternal and neonatal outcome in Malawi.

I understand that I will be asked to respond verbally to questions. I understand that the interview will last approximately 30-45 minutes. I have been informed that my name or other identifying information will not appear on any forms and will not be used when results are presented.

The interview is entirely voluntary and that I am free to withdraw at any time. My decision whether or not to participate will not affect my healthcare in any way whatsoever.

I understand that the new findings developed during the course of the research will be accessible to me.

I voluntary agree to participate in the study.

Further information regarding this study can be obtained directly from:

Alice Kadango University of Malawi, Kamuzu College of Nursing. Blantyre campus, P. O. Box 415, Blantyre. Telephone number +265(0) 995790354 Email address alicekadango@kcn.unima.mw

COMREC Secretariat, University of Malawi, College of Medicine and Research and Ethics Committee, Private Bag 360, Chichiri, Blantyre 3 Telephone number+265 (0) 1871911 Email address comrec@medcol.mw

I have been given the opportunity to ask questions and of my own free will declare myself ready to participate in the study.

Participant's name……..... Signature

Date of interview:…….

Interviewer's signature……

ANNEXURE 8

CONSENT FORM FOR PARTICIPANTS IN CHICHEWA

(CHILOLEZO KUTI NDIFUNSIDWE MAFUNSO OKHUDZANA NDI KAFUKUFUKU)

Ndikupereka chilolezo kuti ndifunsidwe mafunso okhudzana ndi kafukufuku amene azathandize kuti m' Malawi muno tidzakhale ndi uphungu wokwanira kuti tikhale ndi ndondomeko zoyenera kuti amayi ndi abambo amene akufuna kukhala woyembekedzera a zitsata uphungu woyenera kuti amayi ndi mwana azakhale athanzi nthawi yobereka.

Zafotokozeredwa kwa ine kuti nditenga nawo mbali pa kafukufuku wofuna kupeza uphungu woyenera pobereka kwa amayi ndi abambo azaka 18 kufikira 35 amene ndiobereka."Ndikumvetsetsa kuti zotsatira za Kafukufukuyi azizagwiritsidwa ntchito kupititsa patsogolo kuti amayi ndi ana azakhale athanzi nthawi yobereka chifukwa cholandira uphungu woyenera.

Ndamvetsetsa kuti ndi funsidwa mafunso omwe ndizayankha. Zafotokozedwa kwa ine kuti kufunsidwa mafunso ku kutenga pafupi-fupi mphindi makumi atatu (30 minutes) za nthawi yanga. Ndadziwitsidwa kuti dzina langa silidzatchulidwa ndipo silidzaoneka pa chikalata china chilichonse ndiponso silidza gwiritsidwa ntchito muzotsatira zakafukufukuyu.

Kufunsidwa mafunsoku ndi kodzipereka ndekha ndipo nditha kusiya nthawi ina ili yonse. Kutenga nawo mbali, kusatenga nawo mbali kapena kusiya sikudzakhudza chisamaliro changa cha ku chipatala. Choncho ndikupereka chilolezo pomvetsetsa ndi kuyembekezera kuti kafukufukuyu adzapeza zosowa za amayi ndi abambo pofuna kuziwa uphungu woyenera kutsatira nthawi yobereka.

Mwa ine ndekha ndi kusankha kutenga nawo mbali mukafukufuku amaneyu.

Zambiri zokhuzana ndikafukufukuyu nditha kuzipeza Kwa:

Alice Kadango University of Malawi Kamuzu College of Nursing Blantyre Campus P.O. Box 415 Blantyre.Telefoni: +265 (0) 995 790 354 Email address alicekadango@unima.mw

Alembi, University of Malawi, College of Medicine and Research and Ethics Committee, Private Bag 360, Chichiri, Blantyre 3 Telefini nambala ndi +265 (0) 1871911 Email address comrec@medcol.mw

Ndidzapatsidwa adilesi ndi telefoni nambala zimenezi kuti ngati ndingankhale ndizina zomwe ndifune kuziwa zakafukufukuyu nditha Kufunsa.
Dzina langa…….. Saini yanga…….
Tsiku lofunsidwa mafunso……
Saini ya ofunsa mafunso…….
Tsiku lofunsidwa mafunso……

ANNEXURE 9

BUDGET TO CONDUCT THE STUDY

ITEM #	DECRIPTION	UNIT ($)	TOTAL ($)
1	Annual Unisa registration fees for three years	450.00	1,350.00
2	Typing services of the Dissertation		
	Typing services		
	Computer	650.00	650.00
	Printer	450.00	450.00
	Ink and paper	200.00	200.00
3	Photocopying of Research questionnaire	100.00	300.00
4	Research interview planning and booking cocts	150.00	300.00
5	Focus Groups interviews and costs	150.00	1,500.00
6	Cost of Research firm to do the focus group modelration using own instrument	400.00	400.00
7	Cost of field work for data collection in quantitative research	2,000.00	2,000.00
8	Cost to research firm that will conduct and coordinate Quantitative study	800.00	800.00
9	Postage, telephone and internet costs	50.00	150.00
10	Travelling costs for data collection both Focus Groups attendance and field work	100.00	200.00
11	Dissertation edditing cost to a professional editor	250.00	250.00
12	Stastical intepretation of research data	250.00	250.00
13	Photocpying and binding of the Dissertation copies	150.00	150.00
14	Photocopying of final copies after examiners comments	150.00	150.00
15	Binding of final copies after examiners comment and CD ROM copy	150.00	150.00
16	Additional copies for self and interested institutions	100.00	100.00
17	Visits to Unisa for discussion for course related things	1,000.00	2,000.00
18	Graduation travel and accommodation costs including witnesses	900.00	1,800.00
	Grand Total for the PhD program including Research works in US $		13,150.00

ANNEXURE10

SCHEDULE FOR FIELDWORK AND REPORT WRITING

No.	YEAR	MONTH	ACTIVITY ON RESEARCH SUBMITTED	ACTUAL ACTIVITY DONE
1.	2015	January-February	The research proposal	Submitted16/02/15
2.	2015	March- April	Orientation of the study – chapter 1	done
3.	2015	May - June	Literature review- chapter 2	done
4.	2015	June- July	Research Design and methods- chapter 3	done
5.	2015	Aug -Sept	Submission to Unisa ethical committee	done
6.	2015	October-November	Submission of research to COMREC	Submitted June 2016
7.	2016	December	Formulate data collection instruments and pilot study	done
6.	2016	November-December	Data collection	done
7.	2017	January-February	Analysis, presentation and description of the research study	done
8.	2017	March- April	Finalisation of the report	done
9.	2017	July - August	Review of the report by supervisor and the student	On going
10.	2017	September 1st 2 weeks	Final proof reading by the student and supervisor	done
12.	2017	September 2nd 2 weeks	Duplication and Binding	Not done
13	2017	October	Submission of the research study	Submitted for formatting

ANNEXURE 11

SAMPLE LETTERS TO SEEK PERMISSION TO CONDUCT THE STUDY

ANNEXURE 11.1

PERMISSION TO CONDUCT A RESEARCH STUDY AT BLANTYRE URBAN HEALTH CENTRES

Alice Kadango
Kamuzu College of Nursing
P.O Box 415
Blantyre
Malawi
Email address: alicekadango@kcn.unima.mw

The District Health Office
Blantyre District Health Office
Private Bag 66
Blantyre
Dear Sir

PERMISSION TO CONDUCT A RESEARCH STUDY AT LIMBE, NDIRANDE AND ZINGWANGWA HEALTH CENTRES UNDER BLANTYRE DISTRICT HEALTH OFFICE

I write to seek permission to use the above health centres as study sites for a research that intends to investigate on preconception care (PCC) in Malawi.

I am a PhD Nursing and Midwifery Philosophy student at the University of South Africa. As a requirement for fulfilling the programme, I am supposed to conduct a research study.

The research topic is on development of relevant preconception intervention or strategies that would assist to improve maternal and newborn outcomes in Malawi. The subjects are men and women of childbearing age between 18 to 49 years. The research will follow a quantitative paradigm and data will be collected using a structured interview schedule. The process to collect data would last approximately one month.

Looking forward to your favourable response.

Yours faithfully

Alice Kadango (Mrs)

ANNEXURE 11.2

GRANTED PERMISSION TO CONDUCT A RESEARCH STUDY AT BLANTYRE URBAN HEALTH CENTRE

Telephone: Blantyre 01875332 / 01877401
Fax: 01872551/01 878 539

Communication should be addressed to:

The District Health Officer

In reply please quote No. .....

MINISTRY OF HEALTH AND POPULATION
DISTRICT HEALTH OFFICE
P/BAG 66
BLANTYRE
MALAWI

REF. NO.BTDHO/MED/9

10th June, 2016

Alice Kadango - PhD - student

College of Medicine
Private Bag 360
BLANTYRE

Dear Sir/ Madam,

PERMISSION TO USE BLANTYRE URBAN HEALTH CENTERS FOR AN MCH STUDY

I am glad to inform you that permission has been granted for you to conduct a study in our premises entitled:- "*Development of relevant preconception intervention or Strategies that would assist to improve Maternal and Newborn outcomes in Malawi*".

However, this is subject to approval by College of Medicine Research Ethics Committee (COMREC).

Yours faithfully

Dr. Medson Matchaya
DISTRICT HEALTH OFFICER

ANNEXURE 11.3

PERMISSION TO CONDUCT A RESEARCH STUDY AT A CENTRAL HOSPITAL

06/06/2016

Kamuzu College of Nursing
P.O Box 415
Blantyre
Malawi
Email address: alicekadango@kcn.unima.mw

The Director
Queen Elizabeth Central Hospital
PO Box 95
Blantyre

Dear Sir

PERMISSION TO CONDUCT A PILOT RESEARCH STUDY AT QUEEN ELIZABETH CENTRAL HOSPITAL (QECH)

I write to seek permission to use QECH as a pilot study sites for a research that intends to investigate on preconception care (PCC) in Malawi.

I am a PhD Nursing and Midwifery Philosophy student pursuing the studies with University of South Africa, as a requirement for fulfilling the programme I am supposed to conduct a research study.

The research topic is on Development of relevant preconception intervention or strategies that would assist to improve maternal and newborn outcomes in Malawi. The subjects are men and women of childbearing age between 18 to 49 years. The research will follow a quantitative paradigm and data will be collected using a structured interview schedule. The process to collect data would last approximately one month.

Looking forward to your favourable response.

Yours faithfully

Alice Kadango (Mrs)

ANNEXURE 11.4

GRANTED PERMISSION TO CONDUCT A RESEARCH STUDY AT A CENTRAL HOSPITAL

Telephone: (265) 01 874 333 /877 333
Facsimile: (265) 01 876928
Email: queenshosp@globemw.net

All communications should be addressed to:
The Hospital Director

In reply please quote **No.** QEC/GEN/2

QUEEN ELIZABETH CENTRAL HOSPITAL
P.O. BOX 95
BLANTYRE
MALAWI

13th June, 2016

Alice Kadango
Kamuzu College of Nursing
P.O. Box 415
Blantyre
MALAWI

Dear Alice Kadango

RE: PERMISSION TO CONDUCT A RESEARCH PROJECT AT QUEEN ELIZABETH CENTRAL HOSPITAL

This letter serves to inform you that Management has no objection for you to conduct a research project entitled "**Development of relevant preconception interventions/strategies that would assist to improve maternal and newborn outcomes in Malawi**" at Queen Elizabeth Central Hospital.

Wishing you all the best in your studies. Please remember to share with us results of your research after completion.

Yours faithfully,

The Hospital Director
Queen Elizabeth Central Hospital
2016 -06- 13
P.O. Box 95
Blantyre

Ms Linily Chewere
DEPUTY HOSPITAL DIRECTOR
FOR : **HOSPITAL DIRECTOR**

ANNEXURE 11.5

DEPARTMENT CLEARENCE LETTER

UNIVERSITY OF MALAWI
KAMUZU COLLEGE OF NURSING

ACTING PRINCIPAL
Prof. E. Chirwa, DipNurs, MRM,
B.Sc., MN, PhD

P/BAG 1, LILONGWE, MALAWI
TELEPHONE:265 (0)1 751 622/200
TELEGRAMS: NURSING
FAX: 265 (0) 1 756 424
EMAIL: principal@kcn.unima.mw

To: The Chairperson, COMREC
From: Associate Professor L Kumbani
Date: 6TH June 2016

Subject: Development of relevant preconception interventions/strategies that would assist to improve maternal and newborn outcomes in Malawi

I write in support of the above captioned study which Mrs Alice Kadango wishes to conduct. Mrs Alice Kadango is a member of staff in the Maternal and Child Health Department of Kamuzu College of Nursing. She is currently registered with University of South Africa pursuing a degree of doctor philosophy in health studies. Her thesis is entitled “Development of relevant preconception interventions/strategies that would assist to improve maternal and newborn outcomes in Malawi”. She has been granted ethical clearance to conduct this study by University of South Africa Health Studies Higher Degrees Committee, College of Human sciences No. HSHDC/429/2015.The department staff sees this research as relevant and timely because the maternal and neonatal mortality is still high and interventions should be in place like PCC that would improve maternal and newborn outcome. The study is fully supported.

Yours faithfully

Associate Professor L Kumbani (Deputy Head of MCH Department)

ANNEXURE 12

ETHICS APPROVAL FROM COLLEGE OF MEDICINE RESEARCH COMMITTEE

REQUIREMENTS FOR ALL COMREC APPROVED RESEARCH PROTOCOLS

1. Pay the research overhead fees as required by the College of Medicine for all approved studies.

2. You should note that the COMREC Sub-Committee on Research Participants' Safety will monitor the conduct of the approved protocol and any deviation from the approved protocol may result in your study being stopped.

3. You will provide an interim report in the course of the study and an end of study report.

4. You are required to obtain a continuation approval after 12 months from the date of approval.

5. All investigators who are Medical Practitioners must be fully registered with the Medical Council of Malawi

CERTIFICATE OF ETHICS APPROVAL

This is to certify that the College of Medicine Research and Ethics Committee (COMREC) has reviewed and approved a study entitled:

P.06/16/1979 – Development of relevant preconception interventions/strategies that would assist to improve maternal and newborn outcomes by Alice Kadango

On 31st October 2016

As you proceed with the implementation of your study, we would like you to adhere to international ethical guidelines, national guidelines and all requirements by COMREC as indicated on the next page

Dr. C. Dzamalala- Chairperson (COMREC)

Approved by College of Medicine 2016 (COMREC) Research and Ethics Committee

31st October 2016
Date

P.06/16/1979 – "Development of relevant preconception interventions/ strategies that could assist to improve maternal and perinatal outcomes by Alice Kalanga

CERTIFICATE OF ETHICS APPROVAL

This is to certify that the College of Medicine Research and Ethics Committee (COMREC) has reviewed and approved a study entitled:

On 31st October 2016

As you proceed with the implementation of your study, we would like you to adhere to international ethical guidelines, national guidelines and all requirements by COMREC as indicated on the next page

Dr. C. Dzamalala- Chairperson (COMREC) Date

ANNEXURE 13

ETHICS APPROVAL FROM UNIVERSITY OF SOUTH AFRICA

UNISA

UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

REC-012714-039

HSHDC/429/2015

Date: 15 July 2015 Student No: 3369-634-9

Project Title: Development of relevant preconception interventions/strategies to improve maternal and newborn outcomes in Malawi.

Researcher: Alice Kadango

Degree: D Litt et Phil Code: DPCHS04

Supervisor: Prof LH Modiba
Qualification: D Cur
Joint Supervisor: -

DECISION OF COMMITTEE

Approved √ **Conditionally Approved** ☐

Prof L Roets
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

Prof MM Moleki
ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES

ANNEXURE 14

MAP OF MALAWI SHOWING BLANTYRE

(Hutchinson et al 2008:440)

ANNEXURE 15

STATISTICIAN CONSULTATION LETTER

Richmond Chatose Chinula
National Council for Higher Education (NCHE
Private Bag B 371
Lilongwe, Malawi
Email address: rchinula@gmail.com
Cell phone:+ 265 999969979

University of South Africa
P.O. Box 392
UNISA
0003

RESEARCH STATISTICS CONSULTATION SERVICES

I write as a research statistics consultant to confirm that the quantitative data analysis section of the PhD work titled "**Development of relevant preconception interventions and strategies to improve maternal and newborn outcome in Malawi"** was assisted by Chinula statistical consultation services in Malawi.

The firm is registered to assist with interpreting quantitative data, designing statistical models and has extensive knowledge of statistical analysis software programmes including SPSS.

You may contact the consultant on the above address as clearly stated above.

Yours sincerely

Richmond Chatose Chinula
Research statistics consultant

ANNEXURE 16

LANGUAGE EDITING AND PROOFREADING CERTIFICATE

EDITING AND PROOFREADING CERTIFICATE

7542 Galangal Street

Lotus Gardens

Pretoria

0008

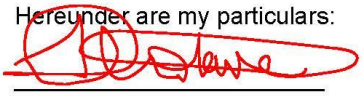
13 October 2017

TO WHOM IT MAY CONCERN

This letter serves to confirm that I have edited and proofread Mrs A Kadango's dissertation entitled: **"DEVELOPMENT OF RELEVANT PRECONCEPTION INTERVENTIONS/STRATEGIES TO IMPROVE MATERNAL AND NEWBORN OUTCOME IN BLANTYRE URBAN, MALAWI".**

I found the work easy and intriguing to read. Much of my editing basically dealt with obstructionist technical aspects of language which could have otherwise compromised smooth reading as well as the sense of the information being conveyed. I hope that the work will be found to be of an acceptable standard. I am a member of Professional Editors Guild.

Hereunder are my particulars:



Jack Chokwe (Mr)

Contact numbers: 072 214 5489

jmb@executivemail.co.za

Professional EDITORS Guild