CAREGIVERS' PERCEPTIONS WITH REGARD TO VACCINE PREVENTABLE DISEASES

by

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Dedication

I dedicate this dissertation to my mother, Florence Ramatsimela Sibanyoni, my children, Busisiwe, Olwethu, Bulelani and Sibabalwe, and my sister Nomvula Sibanyoni for believing in me and allowing me to further my studies.

A special feeling of gratitude to my late father, Amos Sibanyoni and my late husband Mzoli Maseti whose words of encouragement and push for tenacity ring in my ears

Student number: 38702894

DECLARATION

I declare that **CAREGIVERS' PERCEPTIONS WITH REGARD TO VACCINE PREVENTABLE DISEASES IN THE CITY OF TSHWANE** 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.

SIGNATURE

(Elizabeth Maseti)

DATE: 28 JUNE 2015

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CAREGIVERS' PERCEPTIONS WITH REGARD TO VACCINE PREVENTABLE DISEASES

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ABSTRACT

This study investigated caregivers' perceptions with regard to vaccine-preventable diseases in terms of six constructs of the Health Belief Model. A qualitative research design that is explorative, descriptive and contextual in nature was employed in order to understand and describe the perceptions influencing access and utilisation of services that lead to missed immunisation opportunities and consequently outbreaks of vaccine-preventable diseases. The data-collection techniques were individual unstructured in-depth interviews, field notes and clinical records. The sample consisted of twenty two (N=22) caregivers who volunteered to be interviewed. The study has highlighted that caregivers' perceptions or cognitive factors play an important role for having children in completing immunisation schedule to protect the public from vaccine-preventable diseases.

It is recommended that mass media programmes are needed to address the role of vaccines in reducing high morbidity and mortality rates caused by vaccine preventable diseases and improvement in access to immunisation services.

KEY CONCEPTS

Caregiver; perceptions; vaccine-preventable diseases; immunisation; attitudes; health seeking behaviour; vaccines; missed opportunities; Expanded Programme on Immunisation; health care workers.

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LIST OF ABBREVIATIONS

AFP	Acute Flaccid Paralysis
BCG	Bacille Calmette–Guérin
CoMMic	Committee on Morbidity and Mortality in children under 5 years
CRC	Convention on the Rights of the Child
DHIS-SA	District Health Information System in South Africa
DTP	Diphtheria-Tetanus-Pertussis
EPI-SA	Expanded Programme on Immunisation in South Africa
GIVS	Global Immunization Vision and Strategy
HBM	Health Belief Model
HBV	Hepatitis B Vaccine
Hib	Haemophilus Influenzae type b
IPV	Inactivated Polio Vaccine
MCV	Measles Vaccine
MDG	Millennium Developmental Goal.
NHA	National Health Act
OPV	Oral Polio Vaccine
PCV	Pneumococcal Conjugated Vaccine
RV	Rotavirus Vaccine
Td	Tetanus diphtheria
UNICEF	United Nations Children’s Fund
VAPP	Vaccine Associated Paralytic Polio
VPDs	Vaccine Preventable Diseases
WHO	World Health Organization

CHAPTER 1

ORIENTATION OF THE STUDY

1.1 INTRODUCTION

Inadequate levels of immunisation coverage lead to vaccine preventable diseases (VPDs) outbreaks and thus remain a significant public health problem. Therefore, timeliness in immunisation ensures that children are protected as early as possible from vaccine preventable diseases. Hence, looking at timeliness of immunisation is helpful to identify problems in the immunisation process. Moreover, achieving high immunisation coverage levels in vaccine-preventable diseases (VPDs) requires an understanding of the barriers to childhood immunisation.

The VPDs are targeted for elimination and eradication by Expanded Programme on Immunisation (EPI) which was established by the World Health Organization (WHO) in 1974 (Baker 2010: 18). The EPI provide guidance and recommendations to national authorities on how to design, develop and manage immunisation services to efficiently deliver needed immunisations (WHO & UNICEF 2005: 18 - 20). The World Health Assembly's resolution reiterated on the vision for the Decade of Vaccines (2011–2020) in which all individuals and communities should be enjoying lives free from vaccine-preventable diseases (WHO 2013: 12).

However, each vaccine-preventable disease needs a high level of herd immunity to eradicate, eliminate and control many of these infectious agents. According to Friis and Sellers (2009: 449), herd immunity refers to a "situation when immunisation coverage levels in a community are high, protection of the few unimmunised persons is indirectly achieved because the level of protected individuals prevent transmission of that particular infectious agent". Therefore, targets for each vaccine are based on the herd immunity level for a country to reach immunisation goals. On that background of herd immunity, the Global Immunization Vision and Strategy (GIVS) 2006 - 2015 recommends that all countries should achieve and sustain 90% national immunisation coverage in order to reduce childhood morbidity and mortality due to vaccine-preventable diseases (WHO & UNICEF 2005: 16 - 20).

Conversely the WHO and United Nations Children's Fund (UNICEF) report that approximately 2.5 million children under five years of age deaths are attributed to vaccine-preventable diseases (WHO & UNICEF 2005: 3). In addition, the *State of the world's vaccine and immunization report* indicates that more than 24 million children are still not being reached by the routine immunisation services (WHO, UNICEF & World Bank 2009: 4). According to the WHO report, the percentage of children fully vaccinated against Diphtheria, Tetanus and Pertussis (DTP) has held steady at 83% since 2010 (WHO & UNICEF 2013: http://www.who.int/). The latter statement is confirmed by South Africa where the District Health Information System in South Africa (DHIS-SA) data is showing more than 4 million of children missing their DTP booster dose in 2011 and 2012.

Moreover, a Review of Equity and Child Rights revealed a decline in immunisation coverage in the country during 2008 as compared to 1994 (South Africa 2011: 32). Again according to the Department of Health the situation is being described to be stagnated and with sub-optimal levels where nearly 30% of districts did not reach a minimum districts target of 80% for fully immunised children below one (1) year in 2011 (South Africa 2015: 3) . In terms of the Researcher's view it is apparent that the country is still faced with a number of children who are not receiving all eligible vaccines and this challenge contributes towards many missed opportunities in the immunisation programme. Furthermore, this is an indication that immunisation coverage in South Africa is less than desired targets to prevent the spread of vaccine preventable diseases.

Hence, in this chapter, the researcher outlines the entire dissertation. The background and motivation for the study is detailed, the problem is stated and the objectives of the study are formulated.

1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM

The background is dealt in the following sub-sections, namely (1) Overview of EPI-SA, (2) Barriers in immunisation programme and (3) Legislative and ethical framework covering EPI-SA.

1.2.1. Overview of Expanded Programme on Immunisation in South Africa

Prior to 1994, Ngcobo (2008: 10) mention that each of the government structures of the time in South Africa; the Transkei, Bophuthatswana, Venda and Ciskei (TBVC) States; the non-independent homelands and the Republic of South Africa were running different immunisation programmes. After establishing government of the national unity, Expanded Programme on Immunisation in South Africa (EPI-SA) introduced several new vaccines against major vaccine-preventable diseases that are challenging the country since 1995 (Baker 2010: 18).

In light of EPI-SA, the Department of Health indicated that the country has seen more of immunisation progress and has undergone development and changes (South Africa 2015: 5). The department confirmed this increase from the District Health Information System in South Africa (DHIS-SA) data as 63.5%, 78% to 85% in 2000, 2005 and 2010 respectively. In spite of its undisputed past success and commitments, immunisations coverage have not been sustained in all districts to reach 90% national target. This is also confirmed by the National Health’s Strategic Plan which outlines less than 90% of the national immunisation coverage in 2008 (South Africa 2009: 5).

The global and local inconsistency in failing to meet immunisation targets lead to many missed opportunities in the programme thereby contributing to outbreaks of VPDs (Researcher’s personal opinion). Bond, Nolan, Pattison and Carlin (1998: 441 - 444) divide missed opportunities into three categories (1) incomplete immunised children, (2) partially immunised children and (3) unimmunised children (*see* section 1.7.4). A study conducted by the Centers for Disease Control and Prevention (CDC) on *Epidemiology of the Unimmunised Children: findings from the peer-reviewed published literature* identify beliefs and perceptions of parents as the major reasons for unimmunised children (CDC 2009:

12). On the other hand the authors found the major reasons for partially immunised children being missed opportunities and lack of parental knowledge with regard to vaccination.

1.2.2. Barriers in the Immunisation Programme

The researcher reviewed various literature sources which determine several factors challenging immunisation programme. These factors are identified as (1) access and utilisation rates, (2) caregiver's cognitive factors, and (3) the service received by caregivers at clinics (USAID 2003: 45 - 47; Petousis-Harris, Goodyear-Smith, Turner & Soe 2004: 2725 - 2730). A number of studies have affirmed the cognitive factors as the contributory factor to missed opportunities. In addition, the United State Agency for International Development (USAID) describes obstacles such as poor services, malicious rumours or false beliefs that keep caregivers from using immunisation services (USAID 2003: 45 - 47).

Another online study reveal 71% of the respondents believing that the child who is sick or having fever should not be vaccinated while another study revealed 25.3% of the respondents who held the opinion about healthy babies to be exempted from immunisation (Adeyinka, Oladimeji, Adeyinka & Aimakhu 2009: http://ispub.com). In terms of factors related to access and utilisation rates, Savedoff (2009: 5 - 9) argue that access is influenced by a range of perceptions of the population as to whether certain conditions are amenable to treatments that are available in the local community.

1.2.3. Legislative and ethical framework governing EPI-SA

As contemplated in the National Health Act (NHA) No 61 Paragraph 2(c), it is the responsibility of the state to provide the nation with an environment that is not harmful to their health or well-being (South Africa 2003: s 2). The Act recognises the user's right to refuse health services, and mandated health care providers to explain the implications, risks and obligations of such refusal. Conversely, Kling sees the biomedical ethical principle of respect for autonomy as outweighing more heavily in immunisation programme than the other three, viz., beneficence, non-maleficence and justice (Kling 2009: 179).

Kling further argues that the health worker must respect the decision of an autonomous caregiver, even if the health worker believes that the caregiver's decision is wrong.

However, several legislations such as the Constitution of the Republic of South Africa Act No 108 of 1996, the Children's Act, No. 38 of 2005, the African Charter on the Rights & Welfare of the Child as well as the United Nations (UN) Convention on the Rights of the Child (CRC) advocate for the rights of every child to basic nutrition, shelter, basic health care services and social services. In light of these legislations, it is therefore the right of every child to be immunised and the responsibility of every person taking care of a child to meet this right. However, children are not autonomous and their caregivers are the decision-makers in health care. Therefore, children depend on their caregivers to schedule and keep immunisation appointments. The researcher sees the caregivers' beliefs, experiences and attitudes concerning immunisation to be reflected in the decisions they make about whether or not to vaccinate their children.

Moreover, in committing with the provision of best quality care to communities as well as complying with legal and ethical issues, South Africa established the Office of Health Standards Compliance (OHSC) in 2011. The main function of the OHSC is to enforce the implementation of the set regulated national core standards in health facilities for improvement in service delivery. In responding to the major concerns expressed by communities through surveys, complaints and media reports, six non-negotiable priority areas were identified to fast-track improvement (South Africa 2011: 15). Forming part of the regulated national core standards, these six priorities are: (1) Improving staff values and attitudes, (2) Reducing waiting times, (3) Maintaining cleanliness in health facilities, (4) Ensuring patient safety and security, (5) Sustaining infection prevention and control measures and (6) Ensuring availability of medicines and supplies. These priorities have great impact on utilisation of immunisation services that will consequently contribute to prevention of vaccine-preventable diseases.

Although immunisation is not compulsory in South Africa, taking into consideration the legal and ethical issues in relation to vaccination, the freedom of the individual to choose has to be weighed against the public benefit derived from protection and control of infectious diseases. This background to the problem led to the formulation of the following problem statement.

1.3 STATEMENT OF THE RESEARCH PROBLEM

In terms of the given background to the problem, it is apparent that the caregivers' perceptions or cognitive factors play an important role for having children in completing vaccination schedule to protect the public from vaccine- preventable diseases. Most crucial is that incomplete vaccinations or sub-optimal levels of immunisation coverage are very important issues, since they represent inappropriate periods of vaccinations which lead to inadequate protection against vaccine-preventable disease. The researcher has observed the problem of inadequate levels of immunisation coverage in the City of Tshwane which is still not reaching the minimum target of 80% in some antigens as expected by the EPI-SA despite a progressive increase in routine immunisation coverage in the district.

Furthermore, in analysing the district immunisation data, the researcher is of the opinion that many children are accessing immunisation services but do not complete the recommended schedule as evidenced by drop-out rate of more than 10% and coverage of more than 80% in some antigens. While the focus is the elimination and eradication of vaccine-preventable diseases, it is crucial to understand caregivers' perceptions that influence immunisation practices.

1.4 RESEARCH QUESTIONS

The above formulated research problem is summarised by asking the following research questions:

(1) What are the perceptions of caregivers regarding vaccine preventable diseases? and

(2) What could be done by health practitioners to promote vaccination usage by caregivers?

1.5 PURPOSE OF THE STUDY

The main purpose of this research was to identify caregivers' perceptions regarding vaccine-preventable diseases in the City of Tshwane in order to make recommendations to support caregivers in the usage of immunisations.

1.6 RESEARCH OBJECTIVES

In order to achieve the above research purpose, the researcher formulated the following research objectives:

(1) To explore and describe the caregivers' perceptions with regard to vaccine preventable diseases, and
(2) To make recommendations for the promotion of vaccination usage among caregivers.

1.7. DEFINITION OF CONCEPTS

In this section the researcher outlines the definition of concepts used in this study:

1.7.1. Caregiver

For the purpose of this study, caregiver is based on the definition of the Children's Act 38 of 2005, meaning "any person other than a parent or guardian, who factually cares for a child and includes, foster parent or a person who cares for a child with the implied or express consent of a parent or guardian of the child" (South Africa 2005: s1). A caregiver is someone who acts at the best interest of the child and has been identified to assist or represent the child in administrative, contractual and legal matters.

1.7.2. Immunisation Coverage

Immunisation coverage refers to the percentage of eligible population that has been immunised against vaccine-preventable disease according to the country-specific immunisation schedule (WHO 2008: 43). This indicator is very sensitive to the denominator which is derived from the population estimates. The estimates model changes in migration, mortality and fertility at the national as well as the sub-national levels. Nevertheless, this information is valuable to provide rough estimates of the proportion of the population that remains susceptible to the diseases targeted by the vaccines. The WHO (2008: 2 - 4) further based the estimation of immunisation coverage on two sources:

(1) Administrative data which are reports of vaccination performed by service providers.
(2) Coverage survey which are surveys that contains items on children's vaccination history.

In this study, immunisation coverage is calculated for each antigen and for the number of doses completed by an eligible child using data from the District Health Information System.

1.7.3. Drop-out Rates

According to the WHO (2005: 6), dropout rate "refers to a comparison of the number of children who start receiving immunisation and the number who did not receive later doses for full immunisation". The advantage of this indicator is that both the numerator and the denominator are available from routine health data and are thus not subject to the inherent complications associated with a population-based denominator, as with the immunisation coverage indicator. Drop-out rates are output indicators which allow monitoring immunisation programme management, performance, advocacy and communication.

The National Review of the Expanded Programme on Immunisation in South Africa described the drop-out of 10% rate and above to be an indication of problems in the delivery of immunisation services (South Africa 1994: 203 - 215). They occur when people do not return to health facilities for follow-up services. The reasons for this, in the presence of an adequate health facility infrastructure, need to be assessed urgently to prevent outbreaks. The researcher reviewed routine immunisation data from the DHIS-SA and health facility records to indicate the dropout rate in this study.

1.7.4. Missed opportunities

Missed opportunities refer “to a child who did not receive a vaccination for which he or she was eligible” (WHO 2005: 6). According to Bond, Nolan, Pattison and Carlin (1998: 44 - 444), missed opportunities are divided into three categories:

(1) Incomplete immunised is the child who is behind the recommended immunisation schedule.
(2) Partially immunised is the child who missed one or more age appropriate eligible EPI vaccine dose.
(3) Unimmunised child is the one who is missing all age appropriate eligible EPI vaccine doses.

The researcher employed the Road to Health Charts/Booklets in order to identify missed opportunities for this study.

1.7.5. Vaccine-preventable diseases

Friis and Sellers (2009: 465 - 467) refer to vaccine-preventable diseases (VPD) as “infectious diseases affecting children for which vaccines are available to prevent, control, eliminate or eradicate them”. In this study the VPD are all infectious diseases affecting children from birth to 12 years of age for which vaccines are available within the Expanded Programme on Immunisation in South Africa (EPI-SA) schedule:

(1) Poliomyelitis, Tuberculosis, Diphtheria, Tetanus, Pertussis, Haemophilus influenzae type B, Hepatitis B, Measles, Pneumococcal diseases and Rotavirus diarrhoea.

A public health intervention programme requires effective and constant surveillance network systems to eliminate or eradicate the vaccine-preventable diseases.

1.8. META-THEORETICAL GROUNDING

Grbich (2007) as cited in De Vos, Strydom, Fouché & Delport (2012: 297) sees the role of theory in assisting the researcher to choose from a variety of conceptual framework existing across the discipline whenever one wants to provide a more abstract explanation of qualitative research findings. In addition, the authors mention that the researcher is expected to firstly outline a paradigm that supports the points of view or frame of reference for looking or understanding realities. Furthermore the authors argue that paradigm is not necessarily concerned with answering questions but it can tell us where to look for the answers (De Vos et al 2012: 298).

Other authors such as Bond, Nolan, Pattison and Carlin (1998: 441 - 444) explain the research paradigm to be concerned about finding out what people know, believe, think and feel about health and how such cognitive and affective basis are related to their behaviour. Therefore, based on the mentioned descriptions of a research paradigm, the focus of this study is on Health Belief Model (HBM). The HBM was developed by Rosenstock as a conceptual framework to provide an understanding in the implementation of the limited success of public health programs (Matsuda 2002: 11 - 12).

Matsuda (2002: 1 - 2) sees the underlying concept of the original HBM to be health behaviour that is determined by personal beliefs or perceptions about the disease and the strategies involved to decrease its occurrence. According to Rosenstock in Matsuda (2002: 12), the model specifies six related elements that must be present for knowledge about disease to be translated into preventative action. With regard to the HBM, the author asserts that "preventive action will be taken if the negative event (disease) is perceived as serious (perceived severity), the person perceives himself or herself to be susceptible (perceived susceptibility), the action is effective (perceived benefits), then barriers to taking action (perceived barriers)" will prevail.

The fifth element is "cue to action" which is influenced by external and internal stimuli and it triggers the individual's health behaviour. Self-efficacy, which was added to the model as the sixth element, has been shown to increase the predictive power (Bandura 1989: 9).

Several studies have already provided evidence supporting the utility of the HBM in understanding the factors associated with caregivers' immunisation behaviour which is determined by personal perceptions. A study conducted in Cameroon, revealed that caregiver's level of education is having influence on their perceptions towards childhood immunisations (Tuma, Smith, Kirk, Hagmann & Zemel 2002: 55 - 61). These authors found that perceived susceptibility and perceived severity were negatively associated with being complete childhood immunisation. Their level of understanding is dependent on their ability to identify the risk for specific vaccine-preventable disease.

Bond, Nolan, Pattison and Carlin (1998: 441 - 444) attributed poor immunisation uptake in children to "parental apathy, unfamiliarity with disease and barriers to accessing services". According to Weinstein (1993: 324 - 333) in Bond et al (1998: 441 - 444) sees the basic premise for theories of health protective behaviours with respect to childhood immunisation to be the preventive action that is motivated by the desire to avoid or reduce the impact of an anticipated negative health event. In this study, the researcher explored and described the model's six elements in relation to caregivers' perception with regard to vaccine-preventable diseases.

1.9. RESEARCH DESIGN AND METHOD

A qualitative, explorative, descriptive and contextual design was used by the researcher to address the research objectives mentioned earlier in this proposal. According to Burns and Grove (2005: 23 - 27) a qualitative design is define as a "systematic, interactive, subjective approach used to describe the life experiences and give them meaning". Polit and Beck (2012: 488 - 489) points out that in qualitative design, researchers usually collect their data in real-world, naturalistic settings. The design is guided by the researcher's overall world view or paradigm. A descriptive design was relevant since it insisted on the careful description for ordinary conscious experiences of everyday life which include believing, feeling, deciding, evaluating and acting towards the immunisation programme (Polit & Beck 2012: 495). Consequently, a qualitative study design was valuable for covering the contextual conditions which are relevant in understanding perception of caregivers with regard to vaccine preventable diseases

Following the qualitative approach, the study generated knowledge concerned with caregivers' experiences, how they interpret those experiences and what meaning the experiences hold for them with regard to immunisation services. Through understanding caregivers' perceptions and attitudes towards childhood immunisation, the researcher was able to identify relationship between access and utilisation factors contributing to missed opportunities. Consequently the findings of the study assisted in evaluating the immunisation programme and suggesting recommendations for the City of Tshwane.

1.9.1. Sampling

Burns and Grove (2005: 341) refer to sampling as "a process of selecting a group of people, events, behaviour, or other elements with which to conduct a study". Taking into consideration the aim of the intended study which is to discover meaning, to uncover multiple realities and not to generalise to a target population, the researcher therefore established the kinds of people eligible to be included in this study (Polit & Beck (2012: 515). Giving the fact that the explorative, descriptive and contextual study was employed, all participants had attended the immunisation services and were able to articulate what it is like to have lived that experience (Polit & Beck 2012: 523).

Although the study seek caregivers of children who are targeted for vaccination programme, the researcher also explored diversity of individual experiences by specifically looking for people with other differences who have shared a common experience in the immunisation services. This was done when the researcher asked participating caregivers to share experiences of other caregivers in the communities with regard to vaccine-preventable diseases and immunisation services.

1.9.2. Site Sampling

On selecting the research site, De Vos et al (2012: 332) mention that the researcher should identify the site which maximises the opportunity to engage the phenomena under study. Considering the authors' view, the researcher selected population from the City of

Tshwane district in Gauteng Province where research problem under investigation was addressed sufficiently based on the status of immunisation services as described in the previous section. The DHIS-SA estimated the district with a total population of 3, 014 090 and the under 5 year population of 254 311 in 2012.

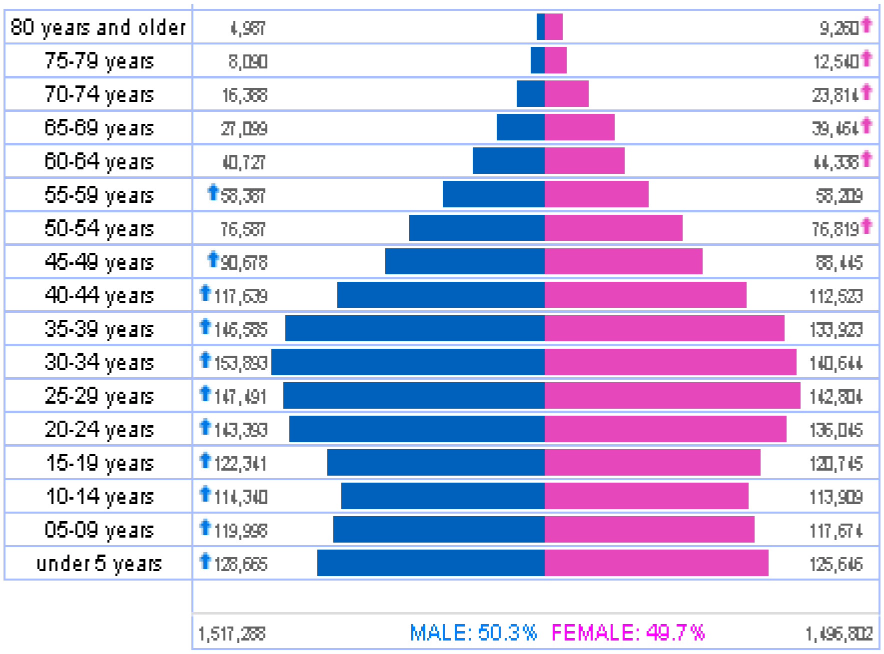

Figure 1.1: Population Pyramid for the City Of Tshwane, 2012

Source: DHIS-SA, December 2012

The under five population are the main target group for immunisation services. In addition to the under 5 population, the other targeted group was 6 and 12 years old children with Td vaccination. The health service in the district is delivered through 1 regional hospital, 5 district hospitals, 8 community health centres and 68 clinics (Gauteng Online 2007). The Province and the municipality shared the governance in the running of clinics in the district. Immunisation services are primarily rendered in clinics and community health centres.

1.9.3. Sample Technique

A non-probability sampling method was used to select study participants. A core characteristic of non-probability sampling techniques is that samples are selected based on the subjective judgment of the researcher, rather than random selection (Friis & Sellers

2009: 257 - 258). This sampling method was useful particularly because the selected design is exploratory in nature where the aim is to find out the reasons for the district not achieving immunisation targets in some antigens as set out by EPI-SA. Both types of non-probability sampling were valuable in the intent study i.e. purposive and convenient sampling. Polit and Beck (2012: 517 - 518) point out that purposive sampling evolves selecting cases that will most benefit the study.

Purpose sampling was employed to select the site while convenience sampling was used to select caregivers who meet eligibility criteria. Participants were selected because of being caregivers of children who are the target group of immunisation programme. A convenience sample is simply one where the units that are selected for inclusion in the sample are the easiest to access. Thus, the researcher initially interviewed caregivers who are in accompaniment of their children on the day of data collection then included potential participants who voluntarily identified themselves to participate in the intended study.

To be eligible for inclusion into the study, individuals complied with the following eligibility criteria:

(1) Caregivers of children from birth to 12 years
(2) Those who brought the Road to Health Cards/Booklets with them
(3) Any caregivers who is at the health centre during data gathering process, irrespective of availability of their children who has experience in utilising immunisation services
(4) Caregivers with legal capacity to give consent in terms of the National Health Act No 61 of 2003

1.9.4. Data collection

This section discusses the aspects of data collection namely: the data collection method and the data collection process.

1.8.4.1. Data collection method

Data collection refers to the precise, systematic gathering of information relevant to the research purpose or the specific objectives of a study (Burns & Grove 2005: 732). It is the gathering of information to address a research problem. Data may be gathered by a variety of data collection methods which correspond with data sources (Mack, Woodsong, MacQueen, Guest & Namey 2005: 2).

Unstructured individual interviews were used to collect data. The researcher used unstructured interviews in order to gain a detailed understanding of the caregivers' perceptions with regard to vaccine preventable diseases and the factors that influenced immunisation uptake. The method gave both researcher and participants more flexibility. It also enabled the researcher to follow up particular interesting avenues that emerged in the interview; enabling the participants to give more information (De Vos et al 2012: 329). Chapter 3 describes in detail the process of data collection.

1.8.4.2. Data collection process

A therapeutic environment and a relationship of trust were established with participants before commencement of the in-depth individual interviews. The strata of the participants consisted of twenty one (21) biological parents of children and one (1) grandparent. However, one transcript (P3) found to be damaged was deleted. The interviews took approximately 15 – 30 minutes depending on participant's willingness to continue with the conversation. While the interviews were in progress, the researcher took field notes about seating arrangements of participants, non-verbal behaviour of participants, themes that were striking as well as personal thoughts, ideas, hunches and impressions.

The interviews were audio-taped in order to capture the participants' original accounts of their views towards vaccine-preventable diseases. Repeated individual interviews were continued until no new or relevant data emerged. Participants were not paid for participating in the study. Participants were debriefed upon completion of the interviews. The researcher left details to participants to contact her at a later stage if they had anything to discuss related to the study. Debriefing helped the researcher to discover any problems generated by the research experience so that those problems can be resolved.

1.9.5. Data analysis

Thematic analysis was used to analyse data. Thematic analysis involves sorting the data into particular themes, categories and patterns (Polit & Beck 2012:556 - 557; Joubert & Ehrlich 2007: 324). Data from the audiotapes were transcribed verbatim and coded into themes, categories and patterns. The emerging themes, categories and patterns were then analysed. The research findings were considered in dialogue with literature and current research in order to offer critique, possible applications, and further directions of research and to enhance rigour of the study.

1.10. ETHICAL CONSIDERATIONS

This section discusses the ethical principles used in the study namely; protecting the rights of participants, protecting the rights of institutions, scientific integrity/honesty on the part of the researcher and maintaining an ethical researcher-participant relationship. The fundamental ethical principles as outlined in Burns and Grove (2005:180 - 181) were adhered to in orders to protect the participants in this study:

1.10.1. Permission to conduct the study

The researcher received an ethical clearance from the UNISA Department of Health Higher Degree Ethical committee after submitting her research proposal prior to data collection (see Annexure A). Permission was also asked and obtained from relevant authorities of the Gauteng Department of Health and Social Development (City of Tshwane) to conduct research (see Annexure C). At the proposed facility, permission was also obtained from the operational manager to interview caregivers and review clinical records to validate immunisation coverage and drop-out rates.

1.10.2. Autonomy and respect for persons

Participation in the study was voluntary and the participants were assured that they could withdraw from the study at any time if they so wished, without penalty.

1.10.3. Scientific integrity/honesty on the part of the researcher

The research findings were considered in dialogue with literature and current research in order to offer critique, possible applications, and further directions of research and to enhance rigour of the study. The researcher avoided all forms of emphasis and slanting to bias the study. The study’s shortcomings were acknowledged in order to enhance scientific integrity of the study.

1.10.4. Protecting the rights of the participants

The researcher provided participants with adequate information that included purpose of the study, risks and benefits to make reasoned decision for their participation in the study. The researcher requested participants to sign a consent form in order to document their voluntary and informed participation. The participants’ responses were kept confidential and their identity remained anonymous in presentations and reports. Anonymity was guaranteed by assigning interviewees codes instead of using their names.

1.10.5. Maintaining an ethical researcher-participant relationship

A collaborative partnership was established and maintained between the researcher and the participants. The researcher respected participants’ values, beliefs, culture and tradition. Any questions or clarity concerning the study and phenomenon involved was provided to the individual participant at the end of each session.

1.10.6. Provision of debriefing, counselling and additional information

The participants were provided with a brief background to the study prior to the commencement of interviews. Any false hopes or expectations that the interview might have caused were respected and talked through to control and minimise emotional or any other risk.

1.11. MEASURES TO ENSURE TRUSTWORTHINESS

Trustworthiness refers to the confidence qualitative researchers have in their data. To enhance the trustworthiness of the research, the researcher used the criteria formulated by Lincoln and Guba (1985) cited in Polit and Becker (2012: 585); Stommel and Wills (2004: 287 - 289). These authors propose four alternative constructs that accurately reflect the assumptions of the qualitative paradigm: viz., credibility dependability, transferability, and confirmability. In this study, member checking was done by having the research participants' review, validate and verify the researcher's interpretations and conclusion (De Vos et al 2012: 345 - 346).

There was also prolonged engagement with the participants; the researcher invested sufficient time collecting data to have an in depth understanding of the participants under study and to test for misinformation and distortions (Polit & Beck 2008: 430). The researcher spent as much time as was necessary interacting with the participants during data collection.

1.12. SCOPE AND LIMITATIONS OF THE STUDY

The study was conducted in a single selected site among health facilities in the City of Tshwane, Gauteng Province. Hence, it would be problematic to generalise the findings to all health facilities and districts in South Africa. Since the data collection instrument was self-reported, responses might be biased of participants' feeling at the time of interview sessions.

1.13. STRUCTURE OF THE DISSERTATION

Chapter 1 describes the study outline
Chapter 2 present the Literature review.
Chapter 3 discusses the research design and methods.
Chapter 4 describe the data analysis and research findings.
Chapter 5 present conclusions and make recommendations for practice and future research

1.14. CONCLUSION

This chapter presented the introduction, background to the study, research problem, purpose, definition of key concepts, meta-theoretical foundations, and the introduction to research design and research methods. The next chapter focuses on Literature review of the study.

CHAPTER 2

LITERATURE REVIEW OF THE STUDY

2.1. INTRODUCTION

This chapter presents the literature review by focusing on the epidemiology and the perceptions of caregivers with regard to vaccine-preventable diseases (VPDs). In addition this chapter presents the conceptual framework to help organise the study and provide a context in which to examine the problem for the purpose of gathering and analysing data.

The purpose of reviewing literature in this study was undertaken to maximise the researcher's chances of summarising the current state of knowledge on the perception of caregivers with regard to VPDs, by having impact on immunisation coverage and drop-out rates. De Vos, Strydom and Delport (2012: 300) also cite that the purpose of utilising existing literature in qualitative research helping to know what other researchers have already said about the topic. Several sources were consulted, including medical and research journals, reports, Internet sources, government circulars and health policy guidelines. In addition, Brink (2001: 76) detailed several reasons of conducting literature review by citing among others as obtaining clues with regard to research methods which serve to inform or support the study.

This study is focusing on vaccine-preventable diseases that affect children from birth to 12 years of age for which vaccines are available according to the Expanded Programme on Immunisation in South Africa (EPI-SA), namely:

1. **Viral Infections:** Poliomyelitis, Measles, Hepatitis B and Rotavirus
2. **Bacterial Infections:** Tuberculosis, Tetanus, Diphtheria, Pertussis, Haemophilus influenzae type B, Pneumococcal diseases

2.2. EPIDEMIOLOGY OF INFECTIOUS DISEASES

All vaccine-preventable diseases (VPDs) are infectious diseases caused by microbial agents such as viruses and bacteria.

2.2.1. Three factors unique to epidemiology of infectious diseases

Similar to all other infectious diseases, vaccine-preventable diseases set to consist of three factors unique to their epidemiology. It is therefore critical to understand sub-clinical infection and immunity in the epidemiology of infectious diseases. Joubert and Ehrlich (2007: 221) describe these factors as:

(1) The organisms that cause infectious disease are necessary causes, which mean that the exposure to infection is essential for disease to occur. For an example, Poliomyelitis is a highly infectious disease caused by poliovirus.
(2) Certain organisms cause sub-clinical infection meaning that infection in an individual remains without evidence of disease for a certain period. For an example, sub-clinical stage with Hepatitis B virus infection may vary from 30 days to 180 days (WHO 2009b: 406).
(3) Immunity may be acquired through exposure to certain organisms or through immunisation with vaccine. Vaccine is a product that stimulates a person's immune system to produce immunity to a specific disease, protecting the person from that disease. Vaccines are usually administered through needle injections, but can also be administered by mouth or sprayed into the nose. For an example, natural disease with measles infection or administration of measles vaccine may provide lifelong immunity.

2.2.2. Causation of Infectious diseases

The classical epidemiological triangle is a useful model of causation in infectious diseases epidemiology. According to Friis and Sellers (2009: 438 - 439) the triangle consists of (1) the agent (organism that cause infectious disease), (2) the host (person with infection) and

(3) the environment (domain in which the disease-causing agent may exist, survive or originate). However, the authors point out that the current view on infectious diseases involves more complex multivariate causalities.

2.2.2.1 Agents of Infectious diseases

Joubert and Ehrlich (2007: 222) define agents as “the organisms that cause infectious diseases”. The authors further describe factors which influence the characteristics of an infectious disease agent to produce diseases as the severity of disease and the outcome of infection. These characteristics with regard to vaccine-preventable diseases are, namely;

(1) **Infectivity:** Refers to the capacity of the agent to enter and multiply in a susceptible host. Examples are Polio and Measles diseases that are regarded to be high infectivity since they multiply rapidly inside a susceptible host;

(2) **Pathogenicity**: It refers to the capacity of the agent to cause disease in the infected host. For example, Hepatitis B is a disease of low pathogenicity as most cases are sub-clinical;

(3) **Virulence:** It refers to the capacity of the agent to cause the severity of the disease. For example, Rotavirus and Ebola virus are highly virulent. The case fatality ratio or probability of dying is very high when infected by these agents.

(4) **Toxigenicity:** Refers to the capacity of the agent to produce a toxin or poison. For example, Corynebacterium diphtheriae produces a cytotoxin to cause Diphtheria infection;

(5) **Resistance:** Refers to the ability of the agent to survive adverse environmental conditions. For example, Polioviruses are resistant to inactivation by many detergents and disinfectants but are rapidly inactivated by exposure to ultraviolet light;

(6) **Antigenicity:** It refers to the ability of the agent to induce antibody production in the host. For example, Mycobacterium tuberculosis and Human Immunodeficiency Virus which produce antibodies that cause Tuberculosis (TB) infection or diseases and AIDS.

2.2.2.2 Host of Infectious diseases

The second causality of infectious diseases is the host and is defined as the person with infection or disease (Joubert and Ehrlich 2007: 222). Furthermore, the authors state that ability of the infectious agent to cause infection to the host is determined by a number of factors e.g. age, sex, customs, occupation, nutritional or immune status and person's activities. In one hand, the establishment of the disease depend either on the efficacy of the defensive mechanisms of the host (immune response) to eradicate the infection or on the properties of the agent's capacity to invade, damage cells, produce toxins and evade the host's immune response. The use of vaccines is of paramount importance since in most cases, they prevent the progression of the infectious disease.

2.2.2.3 Environment for Infectious diseases

The third causality is environment which refers to the domain in which the disease-causing agent may exist, survive, or originate. The environment may act as a reservoir that fosters the survival of infectious disease agents. According to Friis and Sellers (2009: 445 - 446), the environment "is the sum total of influences that comprises of physical, climatologic, biological, social and economic components". These facets have an impact on agents of disease and potential hosts because the environment may either enhance or diminish the survival of disease agents and may serve to bring agent and host into contact. It is documented that crowded living conditions, poor sanitation and areas with low immunisation coverage increase the risk to vaccine-preventable diseases. For example, poverty is associated with vulnerability to infectious diseases because financial constraints predisposes them to live in crowded conditions with poor ventilation, prone to malnutrition which affect their immunological system to react to foreign antigens and difficulties in accessing health care.

2.2.3. Mode of transmission for infectious diseases

Joubert and Ehrlich (2007: 221) describe infectious and communicable diseases as illnesses due to specific agents that arise through transmission of that agent from an infected person, animal, or reservoir to a susceptible host. The bottom-line of EPI is the use of vaccines to interrupt this mode of transmission with the aim of preventing and controlling infectious and communicable diseases. The mode of transmission depends on how an infectious disease is and can be either direct or indirect as described below:

(1) **Direct or person-to-person transmission*:*** sneezes and coughs (measles), vertical transmission (trans-placental), mucosa to mucosa (sexually transmitted diseases), skin to skin (staphylococcus)
(2) **Indirect transmission**: involves the spread of infection through an intermediary source; by water (cholera), food (salmonella), vectors (malaria).

2.2.4. Phases related to infectivity of Vaccine-Preventable diseases (VPDs)

After exposure to an infectious agent, the host may progress through a chain of events leading from sub-clinical infection to an active disease. Friis and Sellers (2009: 446 - 451) describe this chain of events as follows:

(1) **Sub-clinical or Inapparent infection** is one that has not yet penetrated the clinical horizon. This means that an infected individual (carrier) does not have clinically obvious symptoms nevertheless he or she could transmit the disease to other susceptible hosts. For an example, Hepatitis A or HIV.
(2) **Incubation period** is the time interval between exposure to an infectious agent and the appearance of the first signs or symptoms of diseases in a host. The incubation period is often a fixed period of hours, days, or weeks for which the infectious agent replicates within the host (Joubert & Ehrlich 2007: 225).
(3) **Generation time or Serial interval** applies to both inapparent and apparent cases of disease. It relates to the time interval between lodgement of an infectious agent in a host and the maximal communicability of the host. For an example with mumps condition, the period of maximum communicability precedes the swelling of salivary glands by about 48 hours (Friis & Seller 2009: 449).

(4) **Latent phase** is the time from receiving infection to onset of infectiousness, i.e. the ability to transmit the infection. Latent Period is the minimum interval between successive infections in a chain of transmission.

2.3. BASIC IMMUNOLOGY

Immunity is defined as "the ability of the body to tolerate material that is indigenous to it and eliminate material that is foreign" (USAID 2003: 16). With reference to vaccine-preventable diseases, the Vaccinator Manual refers to immunity as the process in which the human body uses a specific mechanism to identify and destroy infectious agents known as antigens by producing protein molecules called antibodies (South Africa 2015: 14).

2.3.1. Processes of Immunity

The Vaccinator Manual further describes the following processes of immunity (South Africa 2015: 14 - 15):

(1) **Vaccination** which refers to an act of introducing a vaccine into the body to produce immunity to a specific disease;

(2) **Immunisation** as a process by which a person becomes protected against a disease through vaccination. However, this term is often used interchangeably with vaccination or inoculation;

(3) **Vaccine Efficacy** refers to the protection conferred upon a healthy, vaccinated individual, or a group of individuals when vaccine is administered in ideal conditions. This means capacity of a vaccine to prevent infection by providing immunity.

(4) **Vaccine Effectiveness** refers to the protection of a population under field conditions, including direct effects and indirect effects/additional protection through herd immunity. The applicability for vaccine effectiveness contributes to policy decisions and public health practice.

2.3.2. Types of Immunity

The aim of immunity from vaccination is through the presence of antibodies to that disease in a person's system. Antibodies are proteins produced by the body to neutralise or destroy toxins or disease-carrying organisms. They are disease-specific: e.g. Measles antibody will protect a person who is exposed to measles disease, but will have no effect if he or she is exposed to mumps. The Vaccinator Manual describes the following two basic mechanisms through which one acquires immunity (South Africa 2015: 14):

(1) **Active immunity** which occurs when an exposure to the disease is through infection with the actual disease resulting in natural immunity, or introduction of a killed or weakened form of the disease organism through vaccination (vaccine-induced immunity) (USAID 2003: 16). Either way, if an immune person comes into contact with that disease in the future, the immune system will recognise it and immediately produce the antibodies needed to fight it. Active immunity is long-lasting, and sometimes can be life-long.

(2) **Passive immunity** occurs when a person is given antibodies to a disease rather than producing them through his/ her own immune system. A newborn baby acquires passive immunity from its mother through the placenta. The major advantage to passive immunity is that protection is immediate, whereas active immunity takes time (usually several weeks) to develop. However, passive immunity lasts only for a few weeks or months.

2.3.3. Herd immunity

As describe in Chapter 1, herd immunity (HI) is a form of immunity that occurs when the vaccination of a significant portion of a population (or herd) provides a measure of protection for individuals who have not developed immunity. It arises when a high percentage of the population is protected through vaccination against a virus or bacteria. The process of herd immunity makes it difficult for a disease to spread because there are so few susceptible people left to infect. Some epidemiologists maintain the important of herd immunity as to differentiate between individual immunity and immunity at a community level while others doubts if it exists. Nevertheless, the understanding that herd immunity exists prevails as it has made it possible to eradicate some forms of VPDs and gave necessary understanding to embark on Global Disease Eradication Initiatives. Examples are Smallpox and current polio eradication initiative.

Therefore, herd immunity is the level of immunity required to prevent epidemics and can be determined from the ***basic reproduction number*** (**R_0**). The basic reproduction number (**R_0**) indicates the average number of cases infected by an infectious case during the individual‘s entire infectious period when he or she enters a totally susceptible population (Joubert & Ehrlich 2007: 223 - 224). The following table indicates herd immunity levels required for each specified vaccine-preventable disease:

Table 2.1 Estimated Herd Immunity Thresholds for Vaccine-Preventable Diseases

Disease	Transmission	R_0[N]	Herd immunity threshold
Diphtheria	Saliva	6 - 7	83 - 86%
Measles	Airborne	12 - 18	92 - 95%
Mumps	Airborne droplet	4 - 7	75 - 86%
Pertussis	Airborne droplet	12 - 17	92 - 94%
Polio	Faecal-oral route	5 - 7	80 - 86%
Rubella	Airborne droplet	5 - 7	80 - 85%
Smallpox	Social contact	6 - 7	83 - 85%
R_0 is the basic reproduction number or the average number of secondary infectious cases that are produced by a single index case in completely susceptible population.			

Source: Modified from Joubert & Ehrlich (2007: 223 - 224)

2.4. EPI AS A GLOBAL PROGRAMME

Vaccine-preventable diseases remain the major cause of morbidity and mortality especially in children. Several authors cited vaccination against childhood communicable diseases through the Expanded Program on Immunisation (EPI) as one of the most cost-effective public health interventions available and as a key to achieve Millennium Development Goals (Matsuda 2002: 6; Ngcobo 2008: 9; WHO, UNICEF & World Bank 2009: 4; Madhi, Bamford & Ngcobo 2014: 228). The schedule for EPI-SA consists of both live attenuated and inactivated vaccines. The Vaccinator Manual describes the production of live attenuated vaccines to take place through a process of modification of disease-producing "wild" virus or bacteria in a laboratory (South Africa 2015: 15).

The Manual further explains that the vaccine organism retains the ability to grow and produce immunity, but does not cause the disease. Examples of live attenuated vaccines are Bacille Calmette–Guérin (BCG), Oral Polio Vaccine (OPV), Measles Vaccine (MCV) and Rotavirus vaccine (RV). In addition, the Vaccinator Manual describe the production of inactivated vaccines to take place by growing bacteria or virus in culture media, followed by inactivation with heat or chemicals or both (South Africa 2015: 15 - 16). Moreover, components of inactivated vaccines are explained not live and therefore cannot cause disease (South Africa 2015: 16). The antibody levels against inactivated vaccines wane over time and therefore inactivated vaccines require periodic booster doses.

2.5. PATHOGENISIS, INCIDENCE AND PREVALENCE OF VACCINE-PREVENTABLE DISEASES

This section focuses on selected vaccine-preventable diseases based on cause-specific fatality rate, burden of disease, low immunisation coverage and high dropout rates among children below 12 years of age. Disease burden estimates integrate rates of infectivity, specific sequelae, and local case fatality. Life expectancies on a national level can help to account for causes of competing mortality, allowing the assessment of health outcomes as deaths, years of life lost, or other measures like disability-adjusted life years (DALYs).

The term incidence describes the rate of development of a disease in a group over a certain time period (Friis & Sellers 2009: 101). The authors refer to incidence rate in “using the frequency of new cases in the numerator meaning individuals who have a history of the disease are not included”. The denominator is the population at risk while the time is the period during which the case accrues. The authors further define Prevalence as the term that refers to the “number of existing cases of a disease or health condition in a population at some designated time”. Furthermore, (Friis & Sellers 2009: 97- 98) allude to Prevalence data as the data that provide an indication for the extent of a health problem and thus may have implication within the scope of health services needed in the community.

As most vaccine-preventable diseases are underreported in many countries, estimates of disease burden are made by a variety of methodologies that account for the susceptible fraction of the population. The estimates are calculated from natural immunity, presumed historical infections, immunisation coverage rates, and vaccine effectiveness. The Global Vaccine Action Plan 2011 - 2020 indicates the number of deaths caused by traditional vaccine-preventable diseases to have fallen from 0.9 million in 2000 to 0.4 million in 2010 (WHO 2013a: 16). Despite progress made, the World Health Organization (WHO) reported that one in every five children is not being reached with vaccination (WHO 2013a: 44). It is further reported that in some countries measles vaccine coverage in rural areas is 33% lower than in urban areas. This report is crucial when one regard socio-economic status being associated with vulnerability to vaccine-preventable diseases. Furthermore, the data indicate that communities are still not fully protected from the threat of VPDs.

2.5.1. Pneumonia

Childhood clinical pneumonia is caused by a combination of exposure to risk factors related to the agent (infection), host, and the environment. Evidence from different studies proves pneumonia as the leading single cause of childhood mortality worldwide (Madhi et al 2014: 228; Rudan, Bosch-Pinto, Biloglav, Mulholland & Campbell 2008: 410; UNICEF & WHO 2006: 4 - 7; WHO & UNICEF 2004: 2). Attempts to understand worldwide childhood pneumonia mortality have been made over several years ago. Furthermore, Rudan et al (2008: 410) estimate the pneumonia case fatality rates to be more than 2 million each year in children aged less than 5 years. However, there are complexities for developing these estimates which the authors describe to include large differences in case definition of pneumonia between studies.

Despite these difficulties of producing estimates with available evidence, pneumonia has consistently been estimated as the leading single cause of childhood mortality as compared to Acquired Immunodeficiency Syndrome (AIDS), Malaria and Measles combined (UNICEF & WHO 2006: 5 - 6). However, the data sources used to model the relationship between pneumonia proportional mortality and all-cause mortality are not representative of the whole world as most of the studies are from countries with low all-cause mortality while only a few data points are from countries with very high all-cause mortality.

Nonetheless, Streptococcus pneumoniae and Haemophilus influenzae type b (Hib) bacteria are found to be infectious agents that are vaccine-preventable and causing most common types of invasive diseases of pneumonia, meningitis, epiglottis and bacteraemia in children across the developing world (WHO, UNICEF & World Bank 2009: 108 & 135 - 137). Bacterial pneumonia usually causes children to become severely ill with high fever and rapid breathing. The bacteria enter the body through the nasopharynx where organisms colonise and may remain sub-clinically for several months in the host (WHO 2012: 132).

The mode of transmission is by droplet spread and by direct contact or indirectly through articles that are soiled with respiratory discharges. Haemophilus influenzae type b is classified as Category B prescribed notifiable medical condition that requires written notification within seven days of diagnosis based on National Health Act No 61 of 2003 in South Africa. Infants and young children are thought to be the main reservoir of these agents with cross-sectional point prevalence of nasopharyngeal carriage ranging from 27% in developed to 85% in developing countries (WHO 2012: 130).

The prognosis of the disease depends upon the integrity of specific host defences, the virulence of the infecting organisms, the age of the host, the site of infection and the adequacy of the treatment (WHO 2012: 132 - 133). The disease burden is higher in children below 5 years of age, undernourished children and those with compromised immune systems that have weakened defences which predispose them to be at high risk of developing severe pneumonia (UNICEF & WHO 2013: 5). Environmental factors, such as living in crowded homes and exposure to parental smoking or indoor air pollution, may also have a role to play in increasing children's susceptibility to pneumonia and its severe consequences.

About 150 million cases of pneumonia are reported every year among children under five globally with more than 95 per cent of all new cases in developing countries (UNICEF & WHO 2013: 5 - 6). It is further indicated that between 11 million and 20 million children with pneumonia require hospitalisation each year while 1 in 5 children die from the disease. Madhi, Bamford and Ngcobo (2014: 238) argue that a greater proportion of vaccine-preventable deaths are currently attributed to diseases for which there are under-utilised and limitation on the use of newly developed vaccines in the developing countries due to high costs of these vaccines. With regard to high cost of vaccines, Kling (2009: 179) identify the inclusion of introducing Pneumococcal Conjugate Vaccine (PCV) and Rotavirus Vaccine (RV) into EPI-SA at a potential additional cost in excess of R800 million per year.

Despite the high cost of these vaccines, in 2009 South Africa demonstrated commitment to reduce pneumonia-specific child mortality by introducing PCV and shifted to the use of DTaP-IPV//Hib in its routine immunisation programme. DTaP-IPV//Hib is combination of Diphtheria toxoid, Tetanus toxoid, acellular Pertussis vaccine, Inactivated Polio Vaccine and a freeze-dried powder conjugate of Haemophilus influenza type b vaccine (Hib). According to Madhi et al (2014: 232), their findings on the effectiveness of PCV and Rotavirus vaccine in South Africa reveal 19% reduction in pneumonia mortality between 2006 and 2011 in the country. However, Madhi et al (2014: 230) indicate the differences in coverage estimates for the new vaccines (PCV, DTaP-IPV//Hib and Rotavirus vaccines) being smaller than the differences in coverage estimates from more traditional vaccines in South Africa.

Figure 2:1 below demonstrates estimates on the global incidence of childhood according to the reported data. As discusses earlier in this section, these estimates may not reflect the true picture of the pneumonia disease burden due to under-reporting.

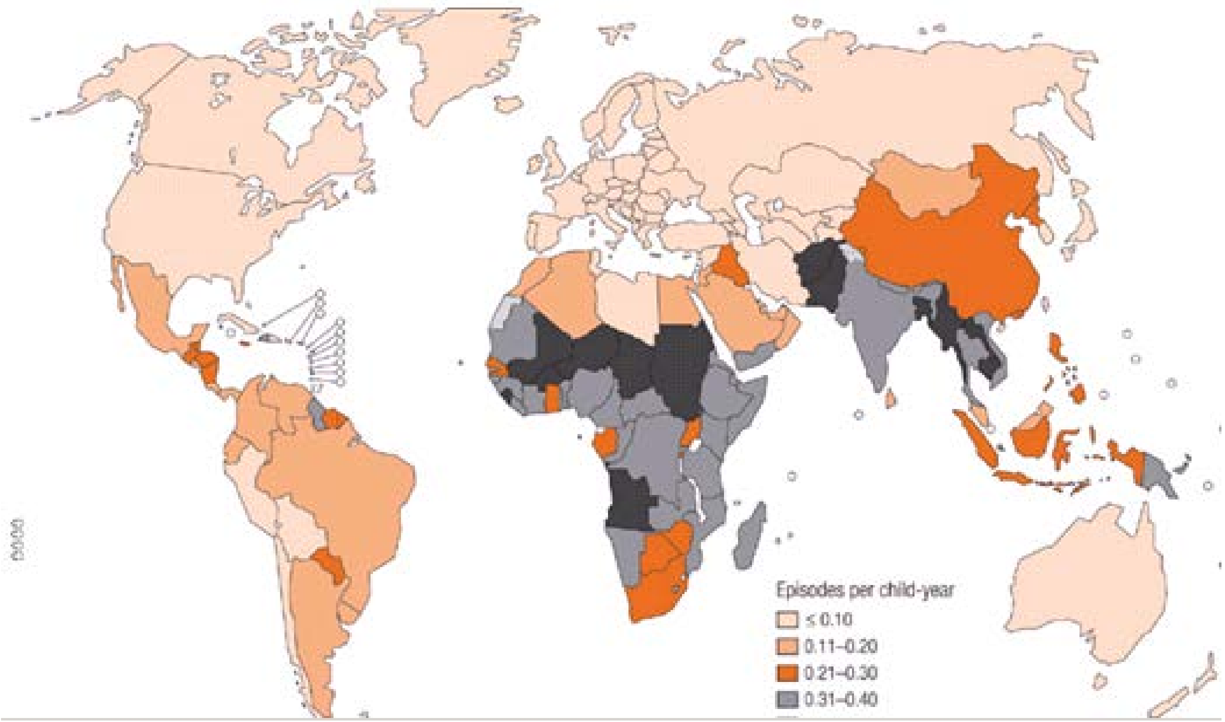

Figure 2.1: Incidence of Childhood Clinical Pneumonia at the country level, 2008
(Source: Rudan et al 2008: 411)

The use of vaccine is the best approach to the control of this condition, for both the immune-suppressed and immune-competent children. In spite of the initiative undertook by South Africa with the introduction of new vaccines, the epidemiological data reveal a decline of DTaP-IPV//Hib vaccination between the initial (1) and third (3) doses in the country by 7% and 4% between 2011 and 2012 (WHO & UNICEF 2014: 161). Furthermore, the immunogenicity data of the country show that specific antibody concentrations among HIV-uninfected children remained above the assumed protective levels compared to unvaccinated HIV-uninfected controls during 6.3 years after PCV vaccination (WHO 2012: 139).

The next section discusses rotavirus diarrhoea as another leading cause of childhood deaths globally and the introduction of Rotavirus vaccine in South Africa. Through this initiative, South Africa showed commitment in reducing childhood deaths caused from vaccine-preventable diseases.

2.5.2. Rotavirus diarrhoea

Rotaviruses are the most common cause of severe diarrhoeal disease in young children throughout the world. It is characterised by vomiting, fever and watery diarrhoea. According to the literature the virus replicates in the enterocytes of the small intestine, causing extensive damage to the microvilli and resulting in malabsorption and loss of fluids and electrolytes (WHO 2007b: 288). Rotaviruses are shed in very high concentrations and for many days in the stools and vomitus of infected individuals. The transmission is primarily by the faecal–oral route, directly from person to person, or indirectly via contaminated fomites with the incubation period of 1-3 days (South Africa 2015:13; WHO 2013: 51). Furthermore, the Weekly Epidemiological Report on rotavirus diarrhoea states that the virus occurs in temperate climates whereas in tropical settings it occurs year round and the incidence peaks during the winter season (WHO 2013b: 50).

Severe rotavirus diarrhoea is largely limited to children aged 6 - 24 months but can occur at any age. According to 2008 estimates by WHO, vaccine-preventable rotavirus infections led to 453 000 deaths in children below 5 years of age (WHO 2013b: 50). In addition, Steele and Glass (2011: 184) estimated 1.34 million children dying worldwide from severe, dehydrating diarrhoea each year while millions more are hospitalised. The authors further cite that diarrheal mortality rates constitute approximately 16% of total childhood deaths.

An epidemiological study conducted at Ga-Rankuwa Hospital (currently known as George Mukhari Academic Hospital) situated near Pretoria identified overall prevalence of rotavirus-associated illness to be 32.8% among diarrheal hospitalised cases in children with a peak seasonal pattern during autumn, late winter and early spring (Steele & Glass 2011: 185). Conversely, Madhi et al (2014: 232) mention 48% reduction in diarrhoea-associated mortality reduction between 2006 and 2011. Commitment to reduce severe disease and/or mortality from diarrhoea has been demonstrated by South Africa when Rotavirus vaccine was introduced into EPI-SA schedule in 2009.

Madhi et al (2014: 231) reveal reduction of under-5 mortality due by diarrhoea and pneumonia in South Africa in the following Table:

Table 2.2: Death of Children, 5 years of age from Acute Diarrhoea and Pneumonia at 18 Hospitals with 6 years of complete data, South Africa, 2007-2012

		Death, n (% of *N*)	
Year	**Total deaths, *N***	**Acute Diarrhoea**	**Pneumonia**
2007	1426	189 (13.3)	259 (18.2)
2008	1436	248 (17.3)	274 (19.1)
2009	1177	204 (17.3)	245 (20.8)
2010	1000	165 (16.3)	152 (15.2)
2011	748	123 (16.4)	145 (19.4)
2012	594	91 (15.3)	108 (18.2)

Source: Madhi, Bamford and Ngcobo (2014: 231)

2.5.3. Measles

Measles is an acute, highly contagious, viral, childhood condition that is transmitted from person to person through large respiratory droplets (South Africa 2015: 10; WHO 2009b: 349) The World Health Organization position paper on Measles vaccines point out the incubation period at 10–14 days (range, 8–15 days) from exposure to onset of rash, and patients to be contagious from about 4 days before eruption of the rash until 4 days after eruption (WHO 2009a: 349).

Measles mortality can be estimated from the susceptibility profile of the population based on historical immunisation coverage rates and natural immunity. In the absence of vaccination, measles is estimated to infect virtually the entire population with the exception of isolated communities (Friis & Sellers 2009: 449). As discussed in the previous statement, transmission to susceptible contacts often occurs prior to diagnosis of the original case. Friis and Sellers (2009: 449) further allude that transmission can be blocked if population-based immunity exceeds approximately 95 percent; limiting cases only to importations (see Table 2.1 - herd immunity).

The severity of measles varies widely, depending on a number of host and environmental factors. The risk of developing severe or fatal measles increases for those aged below 5 years, living in overcrowded conditions, who are malnourished, and those with immunological disorders, such as advanced HIV infection (WHO 2009a: 350). The position paper on measles further states that Vitamin A deficiency contributes to delayed recovery and to the high rate of post-measles complications (WHO 2009a: 351). In addition, measles infection may precipitate acute vitamin A deficiency and xerophthalmia. The paper further reveals measles to accounts for a large proportion of preventable childhood blindness, particularly in Africa. Measles is one of the three EPI-SA target diseases with case based surveillance and laboratory support systems in place with a target to achieve pre-elimination by 2015 (South Africa 2015: 8).

Reports estimate measles infection at 30 to 40 million cases globally with 90% of deaths occurring among children less than 5 years of age. In addition, the Millennium Development Goal report indicates 90% of all measles deaths occurring in sub-Saharan Africa and Southern Asia in 2011 (United Nations 2013: 27). Despite efforts made to interrupt measles virus circulation through routine immunisation and campaigns, South Africa is still faced with failure to maintain high coverage of childhood immunisation in all districts which has resulted in a resurgence of the disease. Hence, the country reported a total of 18,431 laboratory-confirmed measles case-patients from all nine provinces with the highest cumulative incidence of 603 per 100,000 population in children below 1 year of age between March 2010 and 2011.

The recent South African sporadic measles outbreak was confirmed by the National Institute for Communicable Diseases (NICD) in Northern Cape and Gauteng and by 15 December 2014 five more provinces reported incidence of confirmed measles cases. Conversely, the country has set target to achieve 90% measles immunisation coverage in all districts (South Africa 2015: 119). Measles is classified as Category A prescribed notifiable medical condition that requires immediate notification within 24 hours by telephone or fax upon initial diagnosis being either suspected or confirmed followed by written notification within five days of diagnosis based on National Health Act No 61 of 2003 in South Africa.

The epidemiological graph for the confirmed measles cases in infants during the outbreak of the diseases from 2009 until 2010 is represented in Figure 2.2. However, it is advisable to take note that during measles outbreak all age groups were infected and affected by measles.

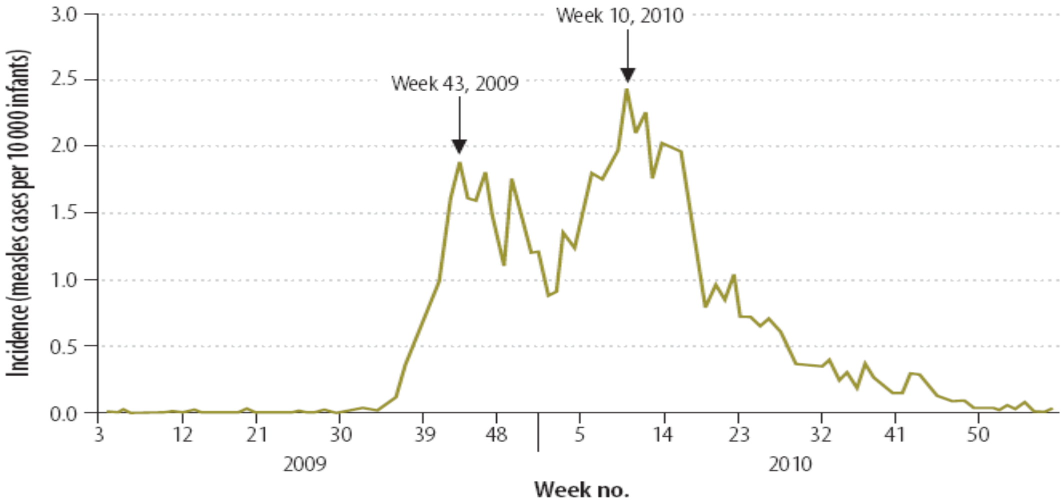

Figure 2.2: Incidence of measles outbreak in infants, South Africa, 2009-2010

Source: Sartorius et al (2013: 175)

Sartorius, Cohen, Chirwa, Ntshoe, Puren and Hofman (2013: 174) indicate that measles disease remains endemic in many countries and killed over 164 000 children worldwide in 2008. The authors alluded that deaths due to measles still occur during outbreaks in areas where the disease is no longer endemic. Measles is prevented with live attenuated virus vaccine administered routinely at nine and eighteen months.

2.5.4. Poliomyelitis

Poliomyelitis is a highly infectious disease caused by any 1 of 3 wild poliovirus (WPV) serotypes (types 1, 2 or 3). Infection with poliovirus results in a spectrum of clinical manifestations from sub-clinical infection to non-specific febrile illness, aseptic meningitis, paralytic disease, and death. With reference to the previous section on agents of infectious diseases, Poliovirus (agent) is of low pathogenicity meaning most infected cases are sub-clinical (asymptomatic).The major route of poliovirus transmission is faeco-oral and direct droplet infection through close association with an infected individual (South Africa 2015: 12; WHO 2014a: 75). Faecal-oral route mainly indicates food-borne infection through the ingestion of contaminated foods which include vehicles like milk, water, or any others that may be contaminated by handling, flies, dust etc. The virus spreads from person to person by contaminated hands and food mainly in areas with poor sanitation. Incubation period is between 7 - 14 days and the cases are most infectious between 7 to 10 days before and after the onset of symptoms. In the faeces, the virus is excreted commonly for 2 to 3 weeks, sometimes as long as 3 to 4 months (WHO 2014a: 75).

The typical clinical manifestation of paralytic poliomyelitis is acute flaccid paralysis (AFP) affecting the limbs, principally the legs, usually asymmetrically; sensation remains intact. Paralytic poliomyelitis occurs when poliovirus enters the central nervous system and replicates in anterior horn cells (motor neurons) of the spinal cord (WHO 2014a: 75). The Vaccinator Manual indicates that the risk of paralysis in infants and in children under 15 years of age ranges from 1 in 100 to 1 in 500 infections (South Africa 2015: 12). According to the Weekly Epidemiological Record on Poliomyelitis, infection is seasonal; occurring more commonly during the summer in countries with a temperate climate, and during the rainy season in countries with a tropical climate (WHO 2014a: 75). Poliomyelitis is classified as Category B prescribed notifiable medical condition that requires written notification within seven days of diagnosis based on National Health Act No 61 of 2003 in South Africa.

The World Health Organization (WHO) reported 223 and 416 poliomyelitis cases in 2012 and 2013 respectively (WHO 2014b: 493). By May 2014 already 71, 4 and 3 cases of poliomyelitis were reported in Pakistan, Afghanistan and Nigeria respectively (WHO 2014b: 496 - 497). Hence, these countries remain endemic for transmission of WPV type 1 (WPV1). Furthermore, the WHO reported 165 cases in Pakistan during January to August 2014 as compared to with 33 cases during the same period in 2013 (WHO 2014b: 493).

The increased number of cases in Pakistan can be attributed to the ban of vaccination campaigns since 2012.

Moreover, the Horn of Africa, Cameroon, and parts of the Middle East (Egypt, Israel, and Syria,) also reported WPV1 circulation associated with imported WPV1 in 2013, resulting in clinical cases following a period of elimination. Until poliovirus transmission is interrupted in these countries, all countries remain at risk of importation of polio (Researcher's opinion). It is therefore crucial for South Africa to understand the effect of migration across borders on the re-emergences of polioviruses. This possible threat of resurgence in the continued circulation of wild polioviruses has led the country to continue with routine administration of Oral Poliovirus Vaccine (OPV) at birth and six weeks of age.

OPV is a trivalent live attenuated vaccine containing antigens of all the three types of poliovirus. Since OPV is a live viral vaccine that can revert to a transmissible pathogenic virus, immune-compromised recipients or those in contact with them can be at increased risk of vaccine-associated paralytic poliomyelitis (VAPP) due to shedding of live virus into the environment. However, it is reported that VAPP occurs in less than one person per 3.3 million doses administered and viral shedding can be chronic and occur for years (WHO 2014a: 75). Due to the risk intolerance associated with vaccine-derived paralysis caused by OPV, in 2009 South Africa transited from OPV to Inactivated Poliovirus Vaccine (IPV) at six weeks, ten weeks, fourteen weeks and eighteen months of age given intramuscularly as a combination of DTaP-IPV/Hib vaccine.

2.5.5. Pertussis

Bordetella Pertussis is exclusively human pathogens define as an acute bacterial infection involving the respiratory tract causing Pertussis also known as whooping cough. The initial catarrhal stage has an insidious onset with an irritating cough, which gradually becomes paroxysmal within 1 or 2 weeks and lasts 1 to 2 months and is characterized by repeated violent coughs (South Africa 2015: 11). Transmission is through contact with discharges from respiratory mucous membranes of infected persons and is also airborne by droplet spread. Despite relatively high immunisation coverage level, Pertussis cases continue to occur. Complications are more common in non-immune infants. Pertussis is classified as Category B prescribed notifiable medical condition that requires written notification within seven days of diagnosis based on National Health Act No 61 of 2003 in South Africa.

Recent reports of Pertussis epidemiology from Asia, Africa and South America are limited but World Health Organization (WHO) estimates demonstrate that these countries have the highest disease burden. The global immunisation data reveal an average coverage with three doses of Diphtheria, Tetanus and Pertussis (DTP) vaccine in low-income countries at 16% below that of high-income countries, in 2010 (WHO 2013a: 18). A national study conducted in Australia, shows that Pertussis remains one of the top 10 causes of death in children under 1 year old worldwide with an estimated 10 million cases (Wood and McIntyre 2008: 202). The authors further reveal as many as 400 000 Pertussis-related deaths annually of which 90% of cases are in developing countries and mostly in infants Furthermore, findings from Australian study identifies 60% of 110 hospitalised infants who contracted infection from their parents (Wood and McIntyre 2008: 202).

According to De Jong (2005: 3) Pertussis continues to contribute a substantial burden of disease in un-immunised infants and increasingly recognised infection and disease in adolescents and adults. The author alludes to unavailability of standardised clinical case definitions in reflecting true burden of Pertussis disease. Furthermore, the author argue that 60 cases of Pertussis notified between 2000 to 2004 represent a substantial underestimate of the true prevalence of disease in South Africa (De Jong 2005: 4).

According to routine EPI-SA schedule, four doses of acellular Pertussis vaccines (DTaP-IPV/Hib) containing inactivated Pertussis toxin is needed for protection in a child below two years of age. The Pertussis vaccination was initially said to be contraindicated in children above two years of age. Moreover both the global and local data reveal that South Africa did not achieve 80% district coverage in three doses of DTP vaccine during 2012 (UNICEF & WHO 2014: 161). In response to this challenge, South Africa revised the catch-up immunisation schedule for children above two years of age to receive DTaP-IPV/Hib vaccine which contain substantially less endotoxin than whole-cell Pertussis vaccines (South Africa 2015: 25).

2.5.6. Diphtheria

A bacterial infection caused by Corynebacterium diphtheriae (C. diphtheriae), an aerobic gram-positive bacillus. Morbidity and mortality result from the bacterial toxin that may cause obstructive pseudo-membranes in the upper respiratory tract (croup) or damage to myocardium and other tissues (South Africa 2015: 9). Transmission is from person to person and takes place through close physical and respiratory contact. The organism produces a cytotoxin that inhibits cellular protein synthesis and is responsible for local tissue destruction and membrane formation. Diphtheria is classified as Category B prescribed notifiable medical condition that requires written notification within seven days of diagnosis based on National Health Act No 61 of 2003 in South Africa.

The Weekly Epidemiological Record on Diphtheria indicate that most infections with C. diphtheriae are asymptomatic or run a relatively mild clinical course and high case- fatality rates of more than 10% have been reported during outbreaks (WHO 2006a: 26). Symptoms of respiratory diphtheria occur usually after an incubation period of 1 - 5 days. The onset is relatively slow and characterized by moderate fever and a mild exudative pharyngitis (WHO 2006a: 26). In severe cases, so called pseudo-membranes gradually form in the throat, into the nasal cavity and the larynx causing obstruction of the airways.

Diphtheria is still a significant child health problem in countries with poor EPI coverage. Urgent treatment of diphtheria is mandatory to reduce complications and mortality. As discussed in the previous sections regarding low immunisation coverage in booster dose of DTP vaccine, a large number of the population is rendered susceptible to diphtheria as a result of waning immunity in South Africa (Researcher's opinion). In April 2015, South Africa experienced resurgence of diphtheria outbreak in KwaZulu Natal Province where 8 confirmed cases and one death were reported by NICD.

According to EPI-SA schedule, an inactive whole bacterium injectable diphtheria vaccine is given as a combination of DTaP-IPV/Hib vaccine from six weeks of age. It has been pointed out earlier that inactivated vaccines require periodic booster dose; therefore diphtheria vaccine requires booster dose at 6 years and 12 years of age. However, the

District Health Information in South Africa (DHIS-SA) reveal distressingly low immunisation coverage in diphtheria vaccine booster doses where above four million children missed six years booster dose in South Africa. From the City of Tshwane only 6, 803 from 45 457 population of 13 years old children received booster dose at 12 years between 2011 and 2012. The DTP vaccine dropout rate has been discussed earlier in this chapter (see Pertussis).

2.5.7. Hepatitis B

The hepatitis B virus (HBV) causes acute hepatitis B disease and humans are the only reservoir of infection. The incubation period is 75 days on average but may vary from 30 days to 180 days (WHO 2009b: 406). Horizontal transmissions is said to occur by close contact, blood or from person to person in early childhood. In Sub-Saharan Africa vertical transmission is the common mode during pregnancy from mother to child and said to account for more than one third of chronic infections (South Africa 2015: 10). Several sources indicate the outcomes of HBV infection to be age-dependent and include asymptomatic infection, chronic HBV infection, a risk of serious illness and death, mainly from liver cirrhosis and hepatocellular carcinoma (HCC) in infected individuals. Hepatitis B is classified as Category B prescribed notifiable medical condition that requires written notification within seven days of diagnosis based on National Health Act No 61 of 2003 in South Africa.

It is estimated that more than 2 billion people world-wide are been infected with HBV while approximately 360 million individuals are chronically infected (WHO 2009b: 405 - 406). Furthermore, reports show acute hepatitis B occurring in approximately 1% of perinatal infections of which 90% become chronic infections while 30% of children between 1 - 5 years of age develop chronic infection (WHO 2009b: 407). In addition it is estimated that 10% of the 40 million people infected with HIV worldwide are co-infected with HBV with increasing risk of developing liver cirrhosis and HCC. Immune tolerance to viral antigens acquired at birth is believed to play an important role in neonatal HBV persistence, whereas the immune mechanisms underlying chronic HBV infection are poorly defined. EPI-SA recommends administration of routine HBV vaccine to all infants at 6, 10 and 14 weeks of age in addition with three routine doses to be administered to all personnel working in health facilities.

In concluding the above section on pathogenesis, incidence and prevalence of VPDs, the undertakings of this study provided insight in understanding the reasons for low immunisation coverage and increasingly missed immunisation opportunities in the City of Tshwane.

2.6 THEORETICAL FRAMEWORK OF THE STUDY

It is important for scientific studies to utilise appropriate theoretical frameworks upon and around which components of a study can be built. The primary purpose of this study was to determine the perceptions of caregivers with regard to vaccine-preventable diseases (VPDs) in one of the public Community Health Centres (CHC) in the City of Tshwane. The Health Belief Model (HBM) was identified by the researcher as the relevant theoretical framework for the purpose of this study, because it is a social-cognitive model which is often used to examine perceptions and attitudes of public participation towards health prevention programmes.

Perception is defined as “a particular way of looking at or understanding something through the senses” (Oxford Dictionary 2010, sv “perception”). According to Wallston ([Sa]: 151) 'something' in this context refers either to the behaviour itself or to the consequences of the behaviour. This notion that perceptions may lead to corresponding behaviour has been recognised many years ago by some most influential thinkers to explain why people did not participate in prevention and screening programmes (Wallston [Sa]: 151; Dijksterhuis & Knippenberg 1998: 866; Rosenstock, Strecher & Becker 1988: 175 - 183). Among the many factors that have been associated with whether or not a person engages in some form of health behaviour is the person's perception of control (Wallston [Sa]: 151). The author further refers to perception of control as the subjective determination of the ability to influence something. The HBM suggests that people’s perceptions or beliefs explain engagement or lack of engagement in health promoting behaviour.

Conversely, Xu, Saksena and Evans (2010: 1) argue that people's perceptions to use health service in promoting health behaviour are still governed by supply and demand factors. The authors describe supply and demand factors to be related to financial affordability, physical factors, social exclusion, marginalisation and cultural factors. This concept supports the statement from Waisbord and Larson when they allude on stagnation in immunisation coverage or under-utilisation of immunisation services to range from infrastructural problems of health delivery systems to funding pressures that divert resources away from routine immunisation (Waisbord & Larson 2005: 1). On the other hand, Plumridge, Goodyear-Smith and Ross (2008: 15) see the interaction between health worker and caregiver as utmost importance during delivery of immunisation services. The authors further argue that once caregivers find offence during this interaction, they may not complete a course of immunisations and may influence others not to immunise.

According to Matsuda (2002: 9) the HBM in context of health-related behaviour depend mainly upon two variables: (1) the desire to avoid illness (or if ill, to get well); and (2) the belief that a specific health action will prevent illness. Thus the researcher uses the HBM to examine the perceptions of caregivers with regard to vaccine-preventable diseases as it plays an important determinant of whether they will avail or not avail their children for immunisation services. The underlying idea is the assumptions that perceptual and behavioural representatives have somehow intimately linked. Therefore, this study attempt to isolate factors which might affect both positive and negative immunisation behaviour by understanding the process involved as well as identifying strategies to change the negative perceptions in order to optimise utilisation of immunisation services.

The following section examines the linkage between caregivers' perceptions with regard to vaccine-preventable diseases and health behaviour as they relate to immunisation practices.

2.6.1 Theoretical Constructs of Perceptions

This section focuses on the main constructs of the HBM that can be used to explain perceptions of caregivers with regard to vaccine preventable disease.

2.6.1.1 Perceived Severity

The free encyclopaedia online describes “perceived severity” construct as subjective assessment of the severity of a health problem and its potential consequences (Wikipedia 2013: sv “perceived severity”). The HBM proposes that individuals who perceive a given health problem as serious are more likely to engage in behaviours to prevent the health problem from occurring (or reduce its severity). Perceived severity encompasses beliefs about the difficulties a disease would create or the effects it would have on his or her life in general. For example, whether it is life-threatening or may cause disability or pain as well as broader impacts of the disease on functioning in work and social roles. In this case if the person is having knowledge that poliomyelitis can cause permanent disability, he/she may perceive that as a serious disease.

The study on *Parents’ awareness and perceptions of the Polio Eradication Programme* reveal 83.6% of parents believing about the severity of poliomyelitis disease (Osowole & Obule [sa]: 3). On the other hand findings from the study conducted by Etokidem Wondifon (2013: 3) show 1% of the focus groups with positive opinion about immunisation and stating that the absence of immunisations will lead to very high mortality in children. In this study, the researcher will determine the perceived seriousness with regard to vaccine-preventable diseases by asking participants probing question such as *“Tell me what will happen to children who contracted infectious diseases?”*

2.6.1.2 Perceived Susceptibility

The free encyclopaedia online describes “perceived susceptibility” construct as subjective assessment of risk in developing a health problem (Wikipedia 2013: sv “perceived susceptibility”). The HBM predicts that individuals who perceive that they are susceptible to a particular health problem will engage in behaviours to reduce their risk of developing the health problem. On the other hand once perceived risks of vaccine-preventable diseases are low vaccination may not deem as a necessary preventive action.

However, a study conducted in Nigeria, show 25.3% of respondents holding the opinion that healthy babies could be exempted from immunisations (Adeyinka, Oladimeji, Adeyinka & Aimakhu 2009: http://ispub.com). Another study conducted in Nigeria showed that only 48.8% of parents believed that their children were susceptible to poliomyelitis against 50.7% who believed that their children were not susceptible to the disease (Osowole & Obule [sa]: 3). To determine perceived susceptibility in this study, the researcher probe participants by asking question like *"When I say the word "immunisation", what are some thoughts that come to your mind?"*

2.6.1.3 Perceived Benefits

The free encyclopaedia online refers to "perceived benefits" construct as an individual's assessment of the value or efficacy of engaging in a health-promoting behaviour to decrease risk or seriousness of the disease problem (Wikipedia 2013: sv "perceived benefits")**.** Matsuda (2002: 9) argue that if individual's own goal is based on avoiding a health problem, the person should be able to identify a specific action that will be beneficial in reducing the health threat. For an example, a study conducted in Turkey found mothers who experienced childhood deaths and disability from the vaccine-preventable diseases perceiving childhood immunisations as a beneficiary and a necessary practice (Topuzoğlu, Ay, Hidiroglu & Gurbuz 2007: 351). These authors further argue that awareness of mothers about the consequences of the vaccine-preventable diseases caused a risk perception and a motivation for availing their children to complete immunisation schedule as recommended.

In addition, Strategic Advisory Group of Expert (SAGE) on immunisations indicates that by having knowledge of someone who suffered from a VPD due to non-vaccination will enhance vaccine acceptance (SAGE 2013: [3]). In this study perceived benefits were attained if caregivers believed that immunisations protect their children from vaccine-preventable diseases by complying with recommended immunisation schedule.

2.6.1.4 Perceived Barriers

The free encyclopaedia online refers to “perceived barriers” as a construct that displays individual's own assessment of the obstacles to behaviour change problem (Wikipedia 2013: sv “perceived barriers”**).** Perceived barriers are regarded as the most significant in determining behaviour change. Even if an individual perceives a health condition as threatening and believes that a particular action will effectively reduce the threat, barriers may prevent engagement in the health-promoting behaviour. In other words, the perceived benefits must outweigh the perceived barriers in order for behaviour change to occur. The literature review in this study reveal significant findings being related to the barriers in vaccination. Avola and Lyon (2013: 14) show through analysis of their study data that caregivers who believe their children were not at risk for influenza were less likely to vaccinate.

Another study published in the Australian and New Zealand Journal of Public Health find the perceive effect of associating strong immune system with the concept of good health as a barrier among incomplete-immunisers and non-immunisers Bond, Nolan, Pattison & Carlin 1998: 443). The authors further allude that vaccines were perceived as having a negative effect on the immune system. The Expert Group on immunisation pointed out that vaccine hesitancy can result from beliefs that VPDs are needed to build immunity and thus vaccines destroy important natural immunity (SAGE 2013: [3]). The Group further mention that perceived barriers result from beliefs that other behaviour like breastfeeding are as important than vaccination to maintain health and prevent VPDs. Perceived barriers in this study were probed by asking participants a “grand tour” question stating “*Tell me of any childhood illnesses that you think can spread to other people and how can children be protected from these illnesses?”*

2.6.1.5 Cue to Actions

This construct incorporates factors that triggers or is necessary for prompting engagement in health-promoting behaviours (Matsuda 2002: 10). Cues to action can be internal or external. The author mention physiological cues (e.g., pain, symptoms) as example of internal cues to action while external cues include events or information from others or health materials (pamphlets) promoting engagement in health-related behaviours.

Examples of cues to action include a return date written on the Road to Health Booklet (RTHB) reminding caregivers on when to bring their children for the next immunisations. Bond et al (1998: 443) found cue to action in school immunisation certificates among incomplete immunisers.

The intensity of cues needed to prompt action varies between individuals through their perceived susceptibility, seriousness, benefits, and barriers of the disease. For example, caregivers who perceive vaccine-preventable diseases as serious illness will ensure that their children complete immunisation schedule as recommended. Whereas caregivers who perceive vaccines as having negative effect on the immune system may either drop-out or not avail their children for immunisation. The Expert Group on immunisation argues that when government policies mandate compulsory immunisation, caregivers may perceive that the pharmaceutical industry is only driven by financial motives and not in health interest therefore creating perceived barriers (SAGE 2013: [2]). In order to gain more insights into recommending strategies for promoting vaccination usage among caregivers in this study, probing question relating to this construct was *"What do you think can be done to get caregivers to bring their children for immunisation?".*

2.6.1.6 Self-Efficacy

The Oxford Dictionary (2010: sv "self") defines "self" as "the person's own nature or qualities that distinguishes them from others" and "efficacy" as "the ability to produce an intended result". This construct therefore refers to people believing in their own self ability to do something. In the context of HBM, self-efficacy refers to an individual's perception of his or her competence to successfully perform behaviour. Self-efficacy was added to the health belief model in an attempt to better explain individual differences in health behaviours. Developers of the model recognised that confidence in one's ability to effect change in outcomes was a key component of health behaviour change. If someone believes a new behaviour is useful (perceived benefit) but does not think that he or she is capable of doing it (perceived barrier) chances are that it will not be tried.

To eradicate, eliminate and control the spread of vaccine-preventable diseases, interventions should aim to boost self-efficacy of caregivers by providing awareness on the benefits of immunisation and the dangers of vaccine-preventable diseases due to incomplete immunisation or non-immunisation of their children. Interventions can be aimed at the individual level (i.e. working one-on-one with individuals to increase engagement in health-related behaviours) or the societal level (e.g. through legislation, changes to the physical environment). This construct was further evaluated by probing participants with a question stating *"What were your feelings the first time you brought the child for vaccination and after vaccination?"*

2.6.1.7 Modifying Variables

The four major constructs of perceptions mentioned above are modified by other variables such as culture, educational level, experiences, skills and motivation to name a few to influence behaviour. In relation to personal educational level or motivation, a study conducted in America reveal that 79% of children who had previously been immunised against influenza, were able to understand the benefits of vaccination, and stated reasons for getting the vaccine to prevent disease (Avola & Lyon 2012: 7). This study also indicates that caregivers who believe vaccines weaken the natural immune system or have unpleasant side effects were less likely to vaccinate. While Bond et al (1998: 444) reveal that caregivers regarded measles, mumps and rubella to have mild effects in young children whereas tetanus was considered a greater risk for older children and other diseases were perceived to be rare.

SAGE (2013: [2]) argues that motivation or awareness on immunisations can be obtained through involvement of community leaders, celebrities in some settings and influencers including religious leaders in others as this can have significant influence on vaccine acceptance or hesitancy. The Expert Group further allude that Vaccine hesitant individuals may accept all vaccines but remain concerned about vaccines safety; some may refuse or delay some vaccines but accept others while some individuals may refuse all vaccines. The health belief model suggests that modifying variables affect health-related behaviours indirectly by affecting perceived seriousness, susceptibility, benefits, and barriers.

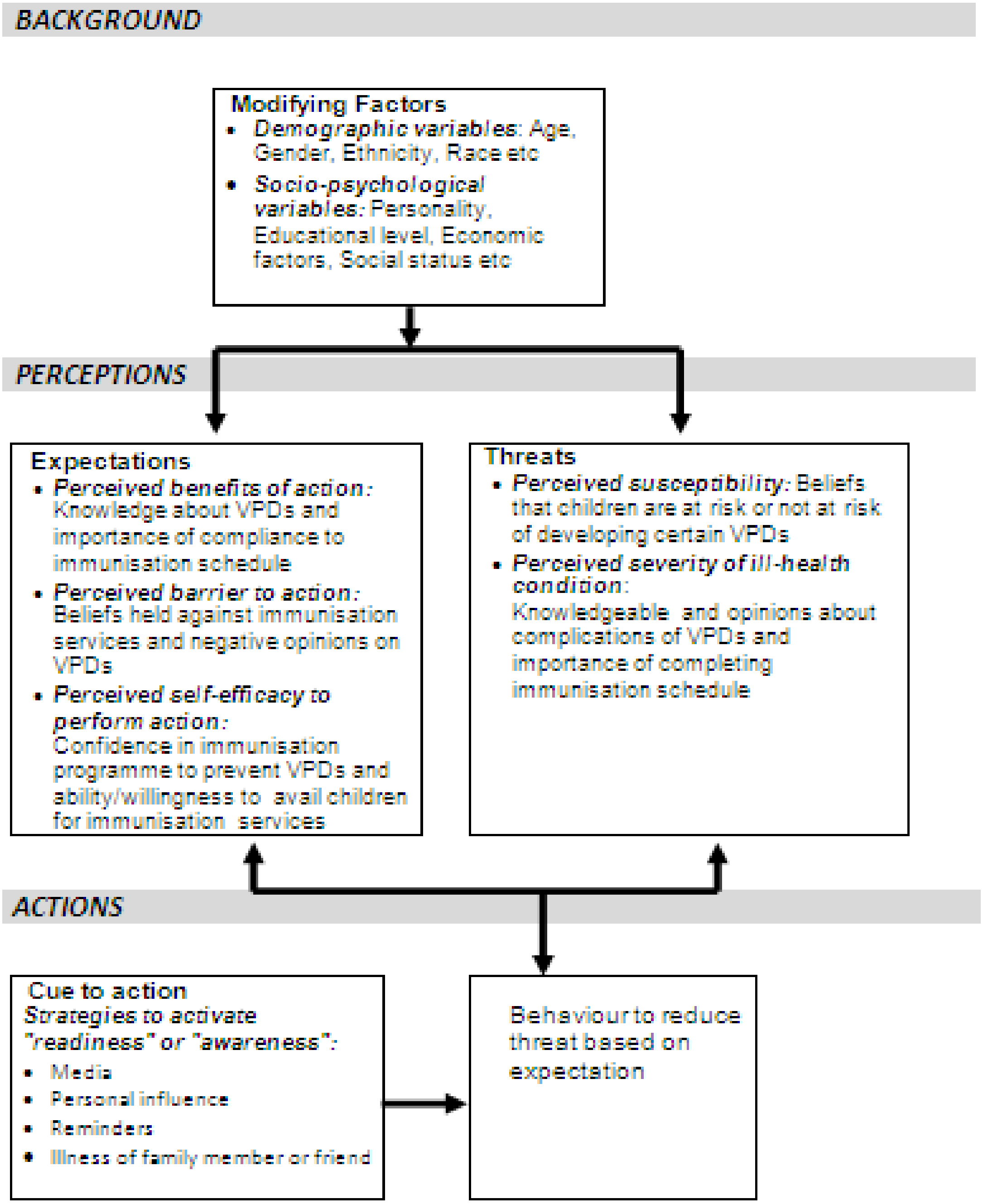

Figure 2.3: A Schematic Outline of the Health Belief Model

Source: Adapted from Matsuda (2002: 9)

2.6.1 Concluding the theoretical constructs of the Health Belief Model

The HBM was spelled out in terms of four constructs representing the perceived threat and net benefits: *perceived susceptibility, perceived severity, perceived benefits,* and *perceived barriers.* Constructs of mediating factors of *cues to action* and *self-efficacy* were also discussed to connect the various types of perceptions with the predicted health behaviour. While on the other hand modifiable factors were discussed to help the HBM better fit the challenges of changing habitual healthy behaviours experienced on daily living. However, findings on *“perceived barriers”* were found to dominate the research literature sources reviewed in this study and multiple factors were identified in the primary sources. In addition, the researcher found strong support for *perceived benefits* predicting health-related behaviours, but weak evidence for the predictive power of *perceived seriousness* and *perceived susceptibility* by the reviewed literature.

2.7 CONCLUSION

When it comes to specific health problems, people often have different ideas on how they can be affected. If they have a health problem, then the perception gap refers to the extent that they believe in medical diagnosis and its potential impact with the cost-benefit analysis being unique for each person. Waisbord and Larson (2005: 10) recognise effective interpersonal communication between health providers and caregivers as the key to build trust and increase acceptance of immunisation services. Using Health Belief Model can assist health providers in seeing the health concerns from the caregivers’ perspective with regard to VPDs. The Researcher is of the opinion that health providers can empower caregivers to become active participants in the immunisation program by including them in the decision making process through adequate collection of information from the caregivers’ perspective.

The next chapter will undertake a detailed presentation of the research design and methodology of the study.

CHAPTER 3

RESEARCH DESIGN AND METHOD

3.1. INTRODUCTION

The previous two chapters introduced the study and give a comprehensive outlined of the dissertation and focus on literature reviewed with regard to vaccine-preventable diseases. This chapter discusses the research design and methodology used to explore and describe caregivers' perceptions with regard to vaccine-preventable diseases (VPDs) in the City of Tshwane. The study also aims at recommending strategies when formulating guidelines to empower caregivers of children who are eligible for vaccination according to Expanded Programme on Immunization in South Africa (EPI-SA) schedule.

3.2. RESEARCH DESIGN

Polit and Becker (2008: 765) define research design as "the overall plan for addressing a research question, including specification for enhancing the study's integrity". In addition, a research design is defined as a blueprint for conducting the study that maximises control over factors that could interfere with the validity of the findings (Burns & Grove 2005: 223). Therefore, the researcher conceptualise research design as an approach of thinking through research topics. For the purpose of this study, the researcher employed a qualitative, explorative, descriptive and contextual design to address the research objectives mentioned earlier in section 1.6. This type of design was used to assess caregivers' perceptions with regard to vaccine-preventable diseases in the City of Tshwane. Findings from the assessment will be used to make recommendations to support caregivers in the usage of immunisations.

Each aspect of the design is described fully in the following sections:

3.2.1. Qualitative aspect of the design

Qualitative design is define as a systematic, interactive, subjective approach to collect data in a real-world, naturalistic settings to describe the life experiences and give them meaning (Polit and Beck 2012: 488 - 489; Burns and Grove 2005: 23 - 27). The design is guided by the researcher's overall world view or paradigm. A generic qualitative design is relevant since it insist on the careful description of ordinary conscious experience on everyday life which include believing, feeling, deciding, evaluating and acting of caregivers towards the immunisation programme (Polit & Beck 2012: 495). Moreover, De Vos, Strydom, Fouché and Delport (2012: 308) point out that qualitative design is concern with subjective exploration of reality from the perspective of research participants as opposed to that of the researcher. Therefore, in order to explore the meanings that caregivers attached to vaccine-preventable diseases, it was necessary to interview them in order to obtain first-hand information of their views concerning these diseases.

3.2.2. Explorative aspect of the design

According to Polit and Becker (2008:20 - 21), exploratory research investigates the full nature of the phenomenon of interest, the manner in which it is manifested and the relating factors attached to the phenomenon. In other words, it provides more insight about the nature of a phenomenon (Brink 2001: 11). The researcher obtained narrative information from research participants through interviews, making notes about how participants behave during interviews and obtaining clinical record from Road to Health Booklets/Cards (Polit & Becker 2008: 60). Since little is known about the factors contributing to low immunisation coverage and high drop-out rates in the City of Tshwane, it was necessary to conduct an exploratory study.

3.2.3. Descriptive aspect of the design

Descriptive studies are those used to describe, analyse and interpret situations and events (De Vos, Strydom, Fouché & Delport 2012: 321). In descriptive studies, the researcher obtains complete and accurate information about a phenomenon through observations and classifications (Brink 2001: 11). According to De Vos et al (2012: 321), descriptive research presents a picture of the specific details of a situation, social setting or relationship, and undertakes to produce detailed descriptions of the phenomenon of interest.

The researcher, therefore, begins with a well-defined subject and conducts research to describe it accurately, whereas in exploratory studies, the researcher aims to become conversant with basic facts and to create a general picture of conditions The descriptive aspect of this study is trying to describe what is happening in more detail, filling in the missing parts and expanding our understanding in the caregivers' perceptions with regard to vaccine-preventable diseases. A descriptive character was therefore suitable for this research because it describe factors influencing access and utilisation of immunisation services which will help to illustrate in detail the perceptions of caregivers with regard to vaccine-preventable diseases in the City of Tshwane.

3.2.4. Contextual aspect of the design

Burns and Grove (2005: 732) describe context as "the body, the world, and the concerns unique to each person, within which the person can be understood". Qualitative researchers believe that social reality is complex and dynamic, thus it can be found only by studying persons as they interact with or within their socio-historical settings. Multiple realities which tend to affect beliefs and assumptions of the society exist and therefore thick description is needed. As a result, qualitative research is always context specific since the data collected can only unfold if the researcher takes context into account. Hence, the researcher should include this context when writing about qualitative research work so that the reader is able to link description of data to a storyline.

Once caregivers' perceptions with regard to vaccine-preventable disease are being described, it will be important to contextualise the findings. Contextualisation of findings is critical for understanding the reality of information obtained from caregivers who are having children eligible for routine immunisation in the City of Tshwane.

Moreover, this study is contextual in the sense that it will be conducted within the urban context, and the findings will be contextualised within the specified setting. The study setting is one of the Community Health Centre rendering immunisation services as one of the key child health intervention defined in the Primary Health Care package. As this setting is an urban setting, the research took into account the social, physical, and cultural values of the participants. In light of qualitative design, the context was a naturalistic setting, and was thus free from manipulation.

3.3. ETHICAL CONSIDERATIONS

The Oxford English Dictionary Online defines ethics as the “moral principles that control or influence a person’s behaviour or the conducting of an activity” and ethical behaviour is defined as “in accordance with principles of ethics; morally right; virtuous decent” (OED Online. [sa]). This definition is in line with the statement pointed out by De Vos, Strydom, Fouché and Delport (2012: 114) when they see “ethical guidelines serving as standards and basis upon which the researcher evaluates his or her own conduct”. However, the authors further argue that researchers will never agree to distinguish between right and wrong as far as ethical issues in research are concerned. Conversely, Morris (2006: 247) as cited in De Vos et al (2012: 127) argues that values and norms play important role in research beside rules and legislation which govern the research.

The fundamental principles of research ethics in South Africa are stipulated by the National Health Act (NHA) no. 61 of 2003. In terms of Chapter 9, the Act prescribes certain aspects under which health research should be conducted (South Africa 2003: s 69). Furthermore section 71 of the Act requires the research on human participants to be conducted within ethical, professional, and legal frameworks. According to Mack, Woodsong, Macqueen, Guest and Namey (2005: 8), issues such as collaborative and mentoring relationship among researchers, intellectually property, fabrication of data and plagiarism form the basis for professional ethics. In addition, the authors state that research ethics deals primarily with the interaction between researchers and the people they study.

Therefore, in accordance with the mentioned legislation and principles of research ethics, the researcher considered ethical practice while conducting the study (De Vos et al 2012: 115 -1 29). The researcher took account to the following basic principles:

3.3.1 Permission to conduct the study

In compliance with section 73 of the NHA 61 of 2003, the researcher sought permission from UNISA, Health Studies Research and Ethics Committee for approval before conducting the research. Thereafter, a copy of the research proposal and a copy of the permission letter from the Higher Degrees Committee of the Department of Health Studies, UNISA were attached and sent along to request permission from the Gauteng Department of Health and Social Development (City of Tshwane) to conduct research. At the proposed facility, permission was also obtained from the operational manager to interview caregivers and review clinical records to validate immunisation missed opportunities.

3.3.2 Informed consent

Prior to a person being able to participate in research activities, the researcher is responsible for obtaining that person's consent to participate wherever it is appropriate to do so. This means that they should know exactly what they are being asked to do, and what the risks are, before they agree to take part. Marc et al (2005: 9) describe an informed consent as a "mechanism for ensuring that people understand what it means to participate in a particular research study so they can decide in a conscious, deliberate way whether they want to participate". Informed consent is one of the most important tools for ensuring respect for persons during research.

The researcher took cognisant of the following three major elements of informed consent as mentioned in Brink (2001: 42 - 45):

3.3.2.1 Information

The emphasis on accurate and complete information about all aspects of the research study was communicated to prospective participants. Three means of communication were employed by the researcher in obtaining informed consent (Brink 2001: 42). Firstly, the verbal communication was employed where the researcher discussed the proposed research study with prospective participant. Secondly, information sheet was presented to participants who were able to read and write. Thirdly, the researcher planned to use a taping devise in the presence of the health facility official acting as a witness in cases where participants cannot read and write. However, all participants in this study were able to read and write.

The researcher explained any other aspects of the research about which potential participants enquired. For an example, one participant asked the researcher *“tell me more about this research you are undertaking”*. For the participants to give consent, the research information included the following (Brink 2001: 42 - 43):

(1) The nature and purpose of the study;
(2) The research methods to be employed by the study;
(3) The reason why they were selected to take part in the study;
(4) The duration of the interview;
(5) The conditions under which the study will be conducted;
(6) The researcher’s title and position;
(7) The potential risks and inconveniences that may arise;
(8) The potential benefits that may result;
(9) What participation in the research will require in practice;
(10) How participant confidentiality will be safeguarded;
(11) What will happen to the data and how it will be stored;
(12) How to raise concerns, or to complain, about the research, and to whom.

3.3.2.2 Understanding

Moreover, Brink (2001: 42) point out that the requirement of the informed consent is that the participants must understand the information. While De Vos et al (2012: 118) view full information as the one which will give opportunity for the research participants to ask questions before the commencement of the study. Full explanations of any technical terms used were explained and the researcher in all means avoided the use of professional jargons. Hence, the word ‘vaccinations’ was replaced with ‘injections’ to fit the caregivers’ level of understanding. The researcher assessed the understanding of the participants by asking questions on the information presented to them.

3.3.3 Voluntary Participation

The researcher explains to research participants, prior to their participation that they have the right on refusing to participate in the research study. Participants were also informed that they have the right to withdraw their participation at any time during the study without having to give a reason. Furthermore, the researcher gave assurance to the participants that their anonymity specified in the original consent agreement shall not be compromised due to their withdrawal from the study. Nonetheless, all participants fully participated in the study as there were neither refusals nor withdrawals from caregivers.

De Vos et al (2012: 116 - 117) argue that even though participants are informed of their voluntary participation in the study, they might somehow obliged to participate if they perceive refusal of their participation would disadvantage them in one or another way. However, the researcher is of the opinion that these perceptions were overcome by ensuring that interviews were conducted after participants received their eligible health care service from the health facility. In addition there were no monetary incentives for participation in this study.

Based on the above, it can be safely stated that consent must be given freely and voluntarily and under no circumstances must direct coercion or indirect pressure be used to obtain a person’s consent to participate in research. Wherever possible and bearing in mind the nature of the research activity, an individual's consent was obtained in writing. Where this is not possible, the researcher envisaged using oral consent as an alternative through tape-recording in the presence of the health facility official who will act as a witness. In addition, witnessed consent was thought to be used particularly for participants who cannot read and write but are deemed capable of giving consent according to the NHA 2003. However, all participants in this study at least obtained grade six (6) schooling and thus were able to read and write. Hence the informed consents were obtained in writing from all participating caregivers.

3.3.4 Principle of respect for person

This principle is based on the right to self-determination that individuals have the right to decide voluntarily whether to participate or not in a study without the risk of penalty. In addition research participants have the right to withdraw from the study at any time without giving any reasons. This principle also allows participants the right to give information or to ask for clarification about the purpose of the study. As mentioned in the previous section, the researcher ensured that this principle was not compromised under any given circumstances. Participants were given an opportunity to retain control over their lives by communicating with them honestly and considering their opinion on vaccine preventable diseases.

Participants were informed that they may request the removal of data collected from the study. The researcher was prepared for this possibility and envisaged to do it in two ways if this was requested (De Vos et al 2012: 117 - 118):

(1) Retaining a link from any code used back to the name of the individual;
(2) To keep this link confidential, and separate from the data.

Hence, to maintain this principle, codes such as P1…P22 were utilised, symbolising the sequence number of participating caregivers during interviews and this was communicated to all participants.

3.3.5 Principle of Beneficence

This principle involves an effort to secure the well-being of persons (Joubert & Ehrlich 2007: 32 - 33). The authors further mention two general rules of ensuring the well-being of persons as (1) do not harm; (2) maximise possible benefits and minimise possible harm. As far as the data collection is concerned, the principle of beneficence was maintained by the researcher that the rule of doing no harm and potential benefits of the study were maintained throughout the study. However participants may have experience psychological risks of anxiety, distress and emotional discomfort during interviews. In minimising the psychological risks, the researcher moved to a state of action in correcting the contradictions or imbalances to promote individual empowerment in vaccination goals when uncovering constraints that impede vaccination service delivery. This was experienced in participants who reported unhappiness with regard to attitudes of staff during immunisation services. Through these rule the researcher took responsibility in showing professionalism, competency, discernment and service during the study.

3.3.6 Principle of Justice

According to this principle, all research participants should be “treated alike or equitably” (Joubert & Ehrlich 2007: 33).The principle of justice was maintained by the researcher to ensure that research participants’ rights to fair selection and treatment and their right to privacy are applied to overcome any psychological harm. In dealing with possible psychological harm, the researcher provided counseling to the affected participant and was prepared to make referrals to specialist in accordance with the Patients’ right Charter when the situation requires. All appointments with, and promises to, participants were honoured and punctuality was observed. The rights, interests, and wishes of participants were assured at all times, and the researcher collected only necessary information, that is, information on perceptions on vaccine-preventable diseases including current or previous immunisation service received by their children.

3.3.7 Scientific integrity of the research

This principle is concerned with respect of the scientific community by protecting the integrity of the scientific knowledge. It was enhanced by avoiding fabrication, falsification, forging of information or intentional manipulation of the research methodology in order to support preconceived view points. According to De Vos et al (2012: 123), researchers must ensure that they are competent and adequately skilled to undertake the proposed investigation before undertaking research.

Thus the researcher's competence is shown by having knowledge, skills and experience in child health including Expanded Programme on Immunisation and participation in the development of immunisation policies in South Africa. Therefore the researcher in this study was guided by scientific principles and also refrained from making value judgements (De Vos et al 2012: 123). All data and findings are presented the way they appear. Plagiarism was also avoided through acknowledgement of all sources referred to both in text and in the bibliography.

3.3.8 Debriefings and referrals

Debriefing sessions provide research participants opportunity to minimise emotional risks by working through their experiences and its aftermath, and where they can have their questions answered and misconceptions removed (McBurney 2001: 60 cited in De Vos et al 2012: 122). The researcher offered a debriefing session after data collection was completed to permit participants to ask questions or to air complaints (Polit & Becker 2008: 182). The details of the researcher were communicated verbally and in writing to research participants to contact her at a later stage if they have anything to discuss related to the study.

De Vos et al (2012: 122) further describe debriefing interviews to take place in a supportive or a therapeutic context. Hence the researcher always strived to be gracious, polite and be sensitive to cultural and linguistic diversity. Moreover, participants were asked the language of choice and interviews were conducted in the manner that was preferred by participating caregivers. Debriefing helped the researcher to discover any problems generated by the research experience so that those problems can be corrected. During the debriefing session, one participant cited *“I am happy that you asked me all these questions, I hope the findings will bring the difference in this clinic”.* Any misperceptions that arose in the minds of participants were rectified after completion of the interview session.

3.4. RESEARCH METHODOLOGY

The researcher deliberated on the concepts of research methodology as they are important because it is through them that the researcher described clearly the population, how the participants were selected and how the data was collected (Polit & Beck 2012: 323 - 325; De Vos et al 2012: 532). The concepts are discussed below.

3.4.1. Population and Sampling

Brink (2001: 132 - 134) defines a population “as the total group of persons or objects that is of interest to the researcher”. The researcher selected population from the City of Tshwane district in Gauteng Province. The Province and the municipality shared the governance in the running of clinics in the district. Immunisation services are primarily rendered in clinics and community health centres.

This study is limited to the accessible population which is defined as the proportion of the target population that is available to be researched and meet the eligibility criteria (Burns & Grove 2005: 341 - 342). According to Joubert and Ehrlich (2007: 94), access population is defined by “person, place and time”. Considering the definition by time and place, the researcher is ensuring that the study remains reasonable within the scope by placing boundaries that will avoid a topic that has too many objectives.

Access population in this study comprised of all the caregivers who are visiting one sampled community health centre in the district on the day of data collection. For this study the setting is an urban community health centre facility situated in City of Tshwane health district east of Pretoria in Gauteng. The health centre is specifically chosen to ensure a better understanding of the perceptions of vaccine preventable diseases by caregivers of children in an urban setting.

Taking into consideration the aim of the study which is to discover meaning, to uncover multiple realities and not to generalise to a target population, the researcher therefore established the kinds of people eligible to be included in this study (Polit & Beck 2012: 515). Given the fact that the generic qualitative design was employed, all participants had experiences in using immunisation services and were able to articulate their perceptions with regard to vaccine-preventable diseases (Polit & Beck 2012: 523).The participants were caregivers of children who meet the eligibility criteria described below.

3.4.2. Eligibility Criteria

Burns and Grove (2005: 342 - 343) define criteria for inclusion into a study as a “list of characteristics essential for eligibility in the target population”. For the purpose of this research study, the participants should meet the following criteria:

(1) Caregivers of children from birth to 12 years
(2) Those who brought the Road to Health Cards/Booklets with them
(3) Any caregivers who is at the health centre during data gathering process, irrespective of availability of their children who has experience in utilising immunisation services
(4) Caregivers with legal capacity to give consent in terms of the National Health Act No 61 of 2003

3.4.3. Sampling Technique

In line with non-probability sampling, the researcher’s sampling technique employed both purposive and convenient sampling in this study. A core characteristic of non-probability sampling techniques is that samples are selected based on the subjective judgment of the researcher, rather than random selection (Friis & Sellers 2009: 257 - 258). The researcher employed purposive sampling for the site which consisted of caregivers who were selected through convenience sampling technique. Mack, Woodsong, Macqueen, Guest and Namey (2005: 5) mention purposive sampling as one of the most common sampling strategies where sample sizes may or may not be fixed prior to data collection, and determined on the basis of data saturation when new data no longer bring additional insights to the research questions.

In addition, various texts point out that in purposive sampling the data review and analysis are done in conjunction with data collection. Thus the researcher gave brief information about the research topic to all participants in the waiting area of the facility, each volunteer who met the eligibility criteria was privately given full description of the study which includes obtaining consent to be audio recorded.

3.4.4. Data Collection Methods

This refers to the steps, procedures and strategies for gathering and analysing data in a research investigation. According to Burns and Grove (2005: 430 - 436), data collection is the process of selecting research subjects and gathering data from them. Mack et al (2005: IV) point out the contribution of qualitative research being culturally specific and contextually rich data which provide comprehensive solutions to public health problems in various settings. De Vos et al (2012: 329) mention that data collection methods are required to unravel and capture people’s conceptions of reality as accurately as possible. These authors further argue that the real world of the research participants can only be understood if words and expressions they use in specific situations are revealed. Polit and Beck (2008: 369) identify four important dimensions along which collection of data approaches vary as:

(1) **Structure:** This dimension indicates what and how information is to be gathered by the researcher. In this study, the researcher selected unstructured plan that allowed for deeper and more thoughtful responses with regard to the phenomenon under study.

(2) **Quantifiability:** This dimension refers to method of analysing collected data. In this study, data collected in narrative form was quantified according to the frequencies of

occurrence for each theme to examine the relationship between completeness of immunisation schedule and perceived construct of the Health belief Model (HBM).

(3) **Researcher obtrusiveness:** This dimension refers to the degree in which people are aware of their status as research participants. To minimise problems from obtrusiveness in this study, the researcher made an effort to put participants at ease by having a general discussion before interview. During interviews, the researcher employed open ended research questions that encouraged participants to reveal relevant information in a natural way.

(4) **Objectivity:** This dimension refers to the degree to which independent researchers can arrive at similar findings. This study is qualitative in nature therefore subjectivity in understanding participants experiences was considered as an asset. However, four constructs reflecting assumptions of qualitative design were used by the researcher to enhance the trustworthiness of the research.

Informed consent was obtained during preliminary interviews when recruiting research participants and also at the beginning of each interview with individual participant. With the assistance and mediation of the nurse in charge of the health facility on each day of data collection, participants were identified as they come to book for health services. In this research project, the researcher uses three methods of data gathering, namely: in-depth individual unstructured interviews, observations in the form of field notes and clinical records. The methods are discussed briefly below:

3.4.4.1. In-depth unstructured interviews

De Vos, Strydom, Fouché and Delport (2012: 342) refer to an interview as “a social relationship designed to exchange information between the participant and the researcher”. These authors further state that interviewing participant involves not only a descriptive of the experience but also reflection on the description. In-depth interviews are used to obtain responses from study subject in a face to face encounter. De Vos et al (2012: 348) point out the purpose of in-depth interviews being to focus on “understanding the experiences of people and the meaning they make of that experience”.

Moreover, Mac et al (2005: 2) refer to in-depth interviews as “optimal tools for collecting data on individuals’ personal histories, perspectives, and experiences, particularly when sensitive topics are being explored”. Joubert and Ehrlich (2007: 319 - 320) sees the advantage of using in-depth interviews to give an opportunity for personal explanation and detailed responses from the interviewee while the interviewer will be drawing more detail information about the subject.

Before each interview session, the researcher did the following:

(1) Thanked the participant for the time and willingness to be part of the study

(2) Reminded the participant about the agreement concerning adherence to the research ethics

(3) Explained that the interview was to be unstructured and that probing questions would be determined by the information given by the participant

(4) Asked permission to record the interview

During the in-depth interview, the researcher engaged willingly with participants in order to understand their responses to a question in the wider context of the whole interview process. Interviews were held in a specific room within the health centre and lasted from 15 to 30 minutes. Unstructured interviews in the form of open-ended questions were adopted as they produced more in-depth information on study subjects, beliefs and attitudes. These interviews are more free-flowing. In addition, these techniques supported use of open-ended questions and had the ability to evoke responses that were meaningful and culturally salient to the participant (De Vos et al 2012: 348 - 351; Mack et al 2005: 4).

Moreover, in-depth unstructured interviews allowed for probe follow-up which increased detailed exploration. Probes are additional prompting questions that encourage the research participant to elaborate on the topic that is being discussed (Brink 2001: 158). A field guide with a list of points to be covered was used to give direction during the interview (Joubert & Ehrlich 2007: 320). However, the researcher ensured that this guide did not inhibit the participant from discussing other points that were important during the course of the interview.

A grand tour question stating "*Tell me of any childhood illnesses that you think can spread to other people and how can children be protected from these illnesses?"* was used to direct the discussion to some extend so that the required information was obtained during interviews. The researcher conducted interviews in one of the sampled health facility consulting room which was allocated by the operational manager in charge. The selection of this venue was based on the fact that it is in more professional environment, non-threatening and easily accessible (De Vos et al 2012: 350). In light of the former statement, the researcher ensured careful listening skills to what participants were saying, engaged with them according to their individual personalities and styles, and used "probes" to encourage them to elaborate on their answers (Mack et al 2005: 5).

Audio-tape recording of the interviews was employed upon permission obtained from the participants. Tape recording assisted the researcher's concentration on the interview proceedings which ultimately ensured proper data capturing (De Vos et al 2012: 359). The researcher made a list of points to be covered during interview but ensuring that these points did not inhibit the interviewer from discussing other points (Joubert & Ehrlich 2007: 320).

The tape-recorded responses were transcribed verbatim after each interview session for the purpose of analysis. The researcher kept the transcripts all the time to ensure that no one had access to them. The researcher envisaged to take detailed notes of interviews in cases whenever consent for audio-taping was not granted by the participants. However, all participating caregivers consented for audio-taping in this study. The researcher took detailed notes of the interviews which were clarified and elaborated after completion of the interview (De Vos et al 2012: 359).

On the first day of the data collection the researcher identified and considered trials and errors in wording and ordering of questions during early interviews. Polit and Beck (2008: 401) point out that listening to the tapes objectively help the researcher to critique his or her own interviewing style and improvements can be made in subsequent interviews. Hence, in the subsequent interviews, questioning was redesigned throughout the project.

At the end of each interview, the researcher showed humanity to all participants by:

(1) Thanking the participant for the time and willingness to be part of the study.
(2) Debriefing sessions conducted with each individual participant to have their questions answered and misconceptions removed.
(3) Informal education on the other vaccine-preventable diseases not mentioned by the participant, modes of transmission and prevention was provided to each participant.
(4) The contact details of the researcher was given to participants to contact her at a later stage if they have anything to discuss related to the study or to any immunisation related issues.

3.4.4.2. Unstructured Observations in the form of field notes

Unstructured observations involve the collection of descriptive information that is analysed qualitatively (Brink 2001: 150 - 152). A complete description of non-verbal communication was recorded in the form of field notes. De Vos et al (2012: 359) refer to field notes as "written account of the things researchers hears, sees, experiences and thinks about in the course of interviewing". The authors further allude that these notes assist the researcher to remember and recall the process of the interview. Polit and Beck (2008: 405) point out that field notes represent observer's efforts to record information and also to synthesise and understand the data.

An environment that is non-threatening, comfortable and providing privacy was maintained by limiting the interview time not to be longer than an hour. During interview sessions, the researcher observed all non verbal communication from the participants. The researcher ensured that the interview setting provided seating arrangement that encourage involvement and interaction between the researcher and the participant (De Vos et al 2012: 350). However the interviews were set at the convenience and comfort of the participants considering the amount of information which each participant shared. Hence the interview sessions varied between 15 – 30 minutes depending on participant's willingness to continue with the conversation.

3.4.4.3. Clinical Records

The Road-to-Health Booklets/Cards (RTHB/C) were utilised to check for completeness and correctness of immunisation schedule as well as for identifying the appropriate use of all available opportunities for immunisation. The data obtained from the record was validated by questioning the participants if the card was used for all visits to the health facility. This assisted in identifying any missed or omitted recording. With one of the participating caregivers, recording on the RTHC was incomplete; on questioning participant the researcher found out that original card with complete recording was lost. This particular participant had other two children whose RTHB/C indicated complete recording.

3.4.5. Data Saturation

Joubert and Ehrlich (2007: 102 - 104) stated in qualitative design, the duration of each interview and examination to collect a sample is determined by the size which is feasible and practical. Therefore, the sample size chosen in this study were considered by the researcher to be practical and feasible until the desired information was obtained. According to Burns and Grove (2005: 358 - 359) the number of participants in a qualitative study is adequate when saturation of data is reached. Saturation of data occurs when additional sampling provides no new information (Burns & Grove 2005: 358 - 359). The same principle was applied in this study, thus, there was no pre-determined sample size. The duration of interview for each participant depended on the quality and depth of information that was needed to answer the research question under study.

3.5. PILOT STUDY

According to Polit and Beck (2008: 213), a pilot study is a small version or trial done in preparation for a major study. It serves the purpose of identifying any problems with the design, sequence of questions, and procedure for recording responses. Pilot study is whereby the researcher becomes alert to his or her own level of interviewing skills and familiarise with the questions to be asked (De Vos et al 2012:349 - 350). Therefore, in view of the mentioned purposes as well as the requirement outline in the Research Ethics document from Gauteng Department of Health and Social Development: Tshwane District, the researcher conducted the pilot study with two participants similar to those who were used in the study.

The results of this pilot did not form part of the actual study. However, the pilot study enlightened the researcher as to the duration of each interview and the appropriateness of the setting as well to establish adequacy of study methods and procedures (De Vos et al (2012: 349 - 350). In summary, the outcome of this pilot study informed subsequent efforts to improve and refine the practical aspects of the major study.

3.6. DATA ANALYSIS

Analysis of data in qualitative study occurred concurrently with the data collection whereby the search for themes and concepts began from the moment data collection got underway (Polit & Beck 2012: 556 - 557). The authors further allude that analysis is an active and interactive process where the researchers become completely familiar with their data. Data analysis entails categorizing, ordering, manipulating and summarising data and describing them in meaningful terms (Brink 2001: 178 - 179). According to Joubert and Ehrlich (2007: 324), content analysis assists where the data will be explored in detail for common themes. The authors further elaborate on establishing common themes into units of meaning or codes which presents comprehensive description of data analysis. In this study, the collected data was analysed in English, which is the language used for reporting the findings.

The researcher employed narrative data analysis strategy since the data collected was descriptive and extensive to answer the research question. Polit and Beck (2012: 557) point out that “qualitative analysis is supported by several tasks that help to manage the mass of narrative data”. Hence, the researcher in this study recorded interviews and used field notes with a data capture sheet listing variables vertically and each record running horizontally. The sheet assisted the researcher in comparing missed opportunities as related to the age of the child.

3.6.1. Steps in data analysis

Brink (2001: 192 - 93) identified typical steps to be followed in analysing the data and the researcher employed these steps:

(1) **Coding for themes and categories** – coding is used to organise data collected in an interview. Common themes were searched then categories established into ideas and information which was collected (Joubert & Ehlrlich 2007: 324).The researcher sought opinion from others by checking the reliability of the coding. The person encoded the same data and checked agreement.

(2) **Developing of categories** was facilitated through the use of manual analysis. Manual analysis involves a thorough review of all recorded information that the researcher has obtained during the course of data collection (Brink 2001: 192 - 193). For example, if the caregiver stated that immunisation prevent diseases; the researcher categorised the statement as *Perceived Benefits* as it has been described under the Health Belief Model mentioned earlier.

(3) **Memoing -** a memo was developed to record insights and ideas related to notes and these were used during the final interpretation of the data.

3.6.2. Transcription of data

Transcription is a crucial process in any qualitative research project as it is the first step in the analysis of raw data. Thus, transcribing qualitative data is designed to capture and unpack the complicatedness and meaning of naturally occurring phenomena (e.g. values, beliefs, feelings, thoughts, and experiences) in social encounters. Polit and Beck (2012: 556 - 557) argue that transcribing qualitative data is challenging because the transcribers make judgments and shapes the meaning of the written words. Furthermore, these authors argue there is a need for researchers to ensure that transcriptions are accurate and that they validly reflect the interview experience.

Burn and Grove (2005: 547) emphasised that the analysis and interpretation process should be deliberate and thorough in order to avoid the use of initial impressions. They also suggest that once a transcript has been prepared, it should be read closely to gain a general understanding of the data. In view of the latter statement, the researcher read thoroughly on the transcriptions. The researcher employed the following steps during the transcription of data:

3.6.2.1 Preparing the text

Full transcripts were made of all taped interviews. When preparing transcripts, the researcher left wide margins around the text to be used for notes and comments on the text. The first stage of the analysis was to clean-up the data.

3.6.2.2 Cleaning the text

The researcher worked through each transcript file and any material that was repetitious or peripheral was removed. This means that only text which did not help in an understanding of the participant's point of view was omitted. However, the researcher decided to leave the text when there were any doubts about whether or not something should be included or deleted. After the transcripts have been stripped of repetitions and oblique references to other things, the researcher engaged in a process of dividing the text into meaning units.

3.6.2.3 Developing a Category scheme and Coding

Polit and Beck (2012: 558 - 559) allude that interview data always needs to be converted into smaller, more manageable data units that can be retrieved and reviewed. The authors describe this process as the procedure to develop a category scheme and then coding data according to the categories. Each transcript was carefully worked through and the text divided up into meaning units. A meaning unit is a discrete phrase, sentence or series of sentences which conveys one idea or one related set of perceptions.

During this process, the researcher was always looking for patterns within the data, viz., for similarities and differences in the responses that participants offered during sessions. The use of a category system allows for the presentation of findings from the data. Hence, once all the meaning units in the transcripts have been separated out, the researcher worked through the text grouping together units using a pad and pencil.

The researcher ensured that the category system that was developed remains true to the text that is being analysed. That is to say that the category system emerged out of the data and offered a clear and true representation of the things that were talked about during interview sessions. To check the validity of this method of analysis, the researcher asked a colleague to develop his own category system from a sample of interview transcripts. The aim of developing a category system is to ensure that all of the meaning units in the text are accounted for.

The researcher carefully read transcribed data, line by line, and divided the data into meaningful analytical units (segmenting the data). When the researcher located meaningful segments, she coded them. Coding is defined as marking the segments of data with symbols, descriptive words, or category names. Whenever the researcher finds a meaningful segment of text in a transcript, she assigned a code to signify that particular segment. This process was continued until all the data have been segmented and initial coding was completed (Polit & Beck 2012: 559 - 560). During coding, the researcher kept a master list (i.e. a list of all the codes that are developed and used in the research study). Then, the codes were reapplied to new segments of data each time an appropriate segment was encountered.

3.6.2.4 Ordering

After validity checks have been run on the category system, and once the meaning units have been labelled with a letter that indicates the category to which each belongs, the whole transcript file was ordered alphabetically. When all of the units have been sorted in this way, the analysed transcript was divided up into discrete categories, with a range of meaning units sorted within each category. Then the researcher was able to check through each category to see whether or not the units of meaning really do fit in particular categories (Polit & Beck 2012: 559 - 560). The researcher made copies of the transcripts by keeping the original separate from these copies as advised by Field and Morse (1985) cited in Burns and Grove (2005: 547).

3.6.2.5 Explanation and Writing up

The method described so far allows for the breaking-down of text into meaning units and the subsequent categorisation of those units into sections that illustrate particular points, ideas or perceptions. The fact that a variety of meanings are grouped together in this way means that the researcher began to look for patterns in the data. Then the researcher offered some explanations for the patterns by stating reasons onto why the data falls into these patterns and suggested the possible significance of these formations. The researcher also linked her findings with those from other research studies and with the literature on the topic. Burns and Grove (2005: 547) emphasise that all findings must remain trustworthy to the data. Therefore the researcher was cautious in ensuring trustworthiness of unspoken meanings, emerging from the totality of the data as described in Section 3.7 of this chapter (Burns & Grove 2005: 547).

In summary, the researcher employed the following steps in the analysis of data collected:

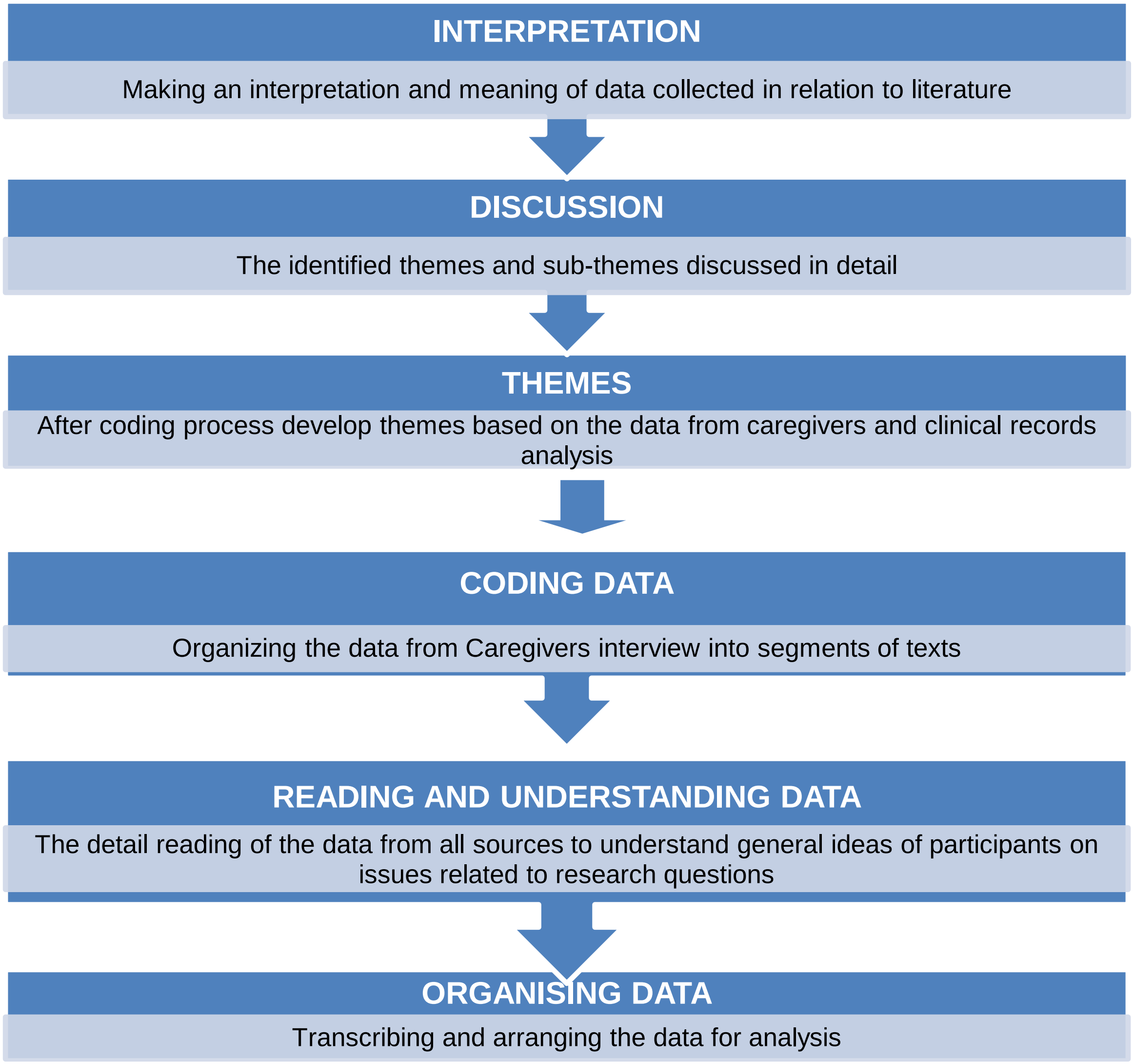

Figure 3.1: Summary of Data analysis steps

3.7. MEASURES OF ENSURING TRUSTWORTHINESS

To enhance the trustworthiness of the research, the researcher used the criteria formulated by Lincoln and Guba (1985) cited in Polit and Becker (2012: 585); Stommel and Wills (2004: 287 - 289), who propose four alternative constructs that reflect the assumptions of the qualitative paradigm more accurately: credibility dependability, transferability unconfirmability.

3.7.1 Credibility

Credibility is a criterion for evaluating data quality in qualitative studies, referring to confidence in the truth and interpretation of the data (Polit & Beck 2012: 585). This is the final standard for judging the quality of data in qualitative research. Stommel and Wills (2004: 289) describe credibility standards to involve performance of specific activities that increase the trustworthiness of the findings. The following strategies were used to enhance credibility of the study:

(1) **Member checking:** During the face-to-face interviews with the participants in the process of data collection, the researcher occasionally checked whether responses were interpreted correctly. The researcher utilised several communication techniques during this process in which clarification on verbal statements was made, viz., paraphrasing by stating participants' words to enhance meaning and reflecting back on something that the participant has just said (De Vos et al 2012: 345 - 346).

During this process, the researcher obtained participants' reactions about interpretive errors or inadequacies to stimulate the participant to give more information or expand on particular idea. Triangulation was applied where two more researchers were allowed to examine data separately from each other and validate conclusions about meanings.

(2) **Prolonged engagement:** This refers to investment of sufficient time in collecting data in order to have in-depth understanding of the research participants, to test for misinformation and distortions and to ensure saturation of key categories (Polit and Beck 2012: 589). This was enhanced by allowing amble time for collecting data from each participant in order to get sufficient information.

Data was collected up to the point of saturation as described in the methodology. In addition to understanding the culture and the environment which may influence the establishment of the truth value, prolonged engagement was also essential for building trust and rapport with participants, which made it easy for them to reveal accurate and rich information.

(3) **Triangulation:** This is defined as the use of multiple sources to draw conclusions about what constitute the truth (Polit & Beck 2012: 196). The researcher employed data triangulation, which involves the use of multiple data sources for the purpose of validating conclusions (Polit & Beck 2012: 590 - 591). Time triangulation which involve collecting data at different times of the day in order to explore perceptions from various participants based on their preferred times on visiting health facility.

Time triangulation was used to assess congruence of caregivers' perceptions with regard to vaccine-preventable disease across different times of the day (Polit & Beck 2012: 590). In addition to time triangulation, the researcher employed method triangulation by using Road to Health Cards/Booklets to check and evaluate the extent to which a consistent and coherent on completeness of immunisation schedule and perceptions of caregivers with regard to vaccine-preventable diseases emerged.

(4) **Reflexivity:** This is a process of reflecting critically on the self by analysing and making note of personal values that could affect data collection and interpretation (Polit & Beck 2012: 589). It entailed continuously examining researcher's own experiences, values, background, and any prejudices or theoretical inclinations that could shape the analysis and interpretation of the study findings. The researcher enabled a colleague to interview her on the phenomenon under study in order to recognise unique set of values and background the researcher brings to intended study.

Through this process of being interviewed, the researcher was aware of the interaction between self and the data. Hence, the researcher was able to analyse personal values with regard to vaccine-preventable diseases by maintaining a neutral position during data collection to avoid biases.

(5) **Peer Review and debriefing:** This involves session with peers to review and explore various aspects of the phenomenon under study (Polit & Beck 2012: 594). A colleague with a background in Public Health, working at the National Department of Health who is outside the context of this study was requested to review the perceptions, insights, and analysis of the research. Throughout the phase of data collection and data analysis, the researcher worked in close collaboration with the supervisor referring samples of interview transcripts and coded analysis for comments and guidance. This further enhanced the credibility of the research.

3.7.2 Dependability

Dependability refers to how stable and unstable the data patterns tend to be over time or occasions (Polit & Beck 2012: 589; Stommel & Wills 2004:287 - 289). Dependability was enhanced by taking steps to ensure that the findings would be consistent if the study is replicated with the same participants or in a similar context. Dependability will be achieved by developing the audit trail, which is a systematic collection of materials, and documentation that would allow an independent auditor to come to conclusions about the data (Polit & Beck 2012: 591).

The researcher has a comprehensive collection of documents that will allow an independent auditor to make conclusions, interpretations, and recommendations about the data, which can be traced back to their sources. Researcher’s documents include field notes, interview transcripts, tapes, and drafts of the final report. This provides others who intend to replicate the research project in another context with the necessary methodological information.

3.7.3 Transferability

Transferability refers to the extent to which findings can be transferred to other settings or groups (Polit & Beck 2012: 585). Lincoln and Guba cited in Polit and Beck (2012: 585) argue that researchers have a responsibility of providing sufficient descriptive data so that the readers can evaluate the applicability of the data to other contexts. This is conceptually similar to generalizability, which refers to the extent to which findings can be generalised to other situations and target populations (Stommel & Wills 2004: 287- 289). Transferability was ensured through the following methods:

(1) **Thick description:** Polit and Beck (2012: 595) refers to thick description as rich, thorough and vivid description of the research context, setting and reporting them with precision. There is a comprehensive description of the research methods used, and participants' direct responses are given. Peer examination was employed where the researcher provided thick description to determine whether findings of the study are applicable in other settings. Thick description includes the nature of the study participants, their reported experiences and the researcher's observation during the study. This provides sufficient information to permit judgement about the transferability of the research findings.

(2) **Purposive sampling:** A qualitative researcher uses purposive selection of participants and location to maximise the range of specific information required. The researcher used purposive sampling to select research site to identify caregivers based on the inclusion criteria who provided information that was required. Data from this study is transferable to their sources only, which is caregivers' perceptions with regard to vaccine-preventable diseases seeking health care at one of the Community Health Centres in the City of Tshwane.

3.7.4 Confirmability

According to Polit and Beck (2012: 585), confirmability refers to “guarantee that the findings, conclusions and recommendations are supported by the data and that another researcher can arrive at the same conclusions as the primary researcher”. This is accomplished by use of audit trails in which approaches to data collection, decisions about the type of data to be collected and interpretations about data are carefully documented. Stepwise replication was used to assess the internal consistency of the data. A portion of data was sent to an independent auditor for analysis to check comparability and similarity. Any discrepancies were resolved. In addition, bracketing was also exercised, that is, putting aside any preconceived ideas and opinions the researcher might have about immunisation services and be open to the participant’s perceptions (Brink 2001: 119 - 120).

3.8. CONCLUSIONS

This chapter discussed the research design and methodology for the study. The data collection method and data analysis were explained. The next chapter presents the analysis of data and findings of the study.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

4.1. INTRODUCTION

In chapter 3, the research design and methods are discussed in detail. This chapter presents the discussion of the research findings of the study. Such discussions were made with reference to literature in order to conceptualise the findings. In this chapter, the researcher begins with a description of how the interviews were arranged and conducted. The final section addresses the important themes and categories which emerged from analysis of the interview data. The findings are discussed with reference to the research objectives.

4.2. PILOT TESTING, DATA GATHERING AND ANALYSIS

This section describe pilot testing, field work experience, data gathering, analysis and the sample population

4.2.1. Pilot testing

Two participants were used to pilot the questions that guided the study. The researcher became alert to her own level of interviewing skills and also familiarised herself with the questions to be asked (De Vos, Strydom, Fouché & Delport 2012: 349 - 350). From the pilot study it became apparent that 30 minutes duration will be adequate.

4.2.2. Field work experience

The data was collected by in-depth individual interviews with twenty two (22) participants who met the eligibility criteria as explained in chapter three of this study. The strata of the participants consisted of twenty one (21) biological parents of children and one (1) grandparent. However, one transcription (P3) was deleted due to damages resulting in poor audio recordings. Only twenty one (21) transcriptions were analysed in this study. The sample was 100% female, with participants' ages ranging from 22 to 67 (mean age = 31.5 years, SD=9.4).Interviews were tape-recorded and transcribed verbatim. To protect the participants' privacy, anonymity and confidentiality, the researcher used codes and not the participants' names. Data was collected until there was a redundancy of information in the form of data saturation. The interviews took place in one of the consulting room of emergency unit at the sampled Community Health Centre (CHC).

This study set to document knowledge and perceptions of caregivers with regard to vaccine –preventable diseases (VPDs) which included their attitudes and practices towards immunisation services of children between 0-12 years. Interview dates and times were arranged ahead of time with the health facility manager. After the first day of the interview sessions, arrangements were extended to professional nurses who were responsible for seeing children together with the Emergency unit manager on duty. The data was collected over four days in August 2014. Interviews were conducted in English, Sesotho, Setswana, Sepedi, isiZulu and isiXhosa, based on the participant's language of choice.

The interview guide, the time allocated and audio tape recordings were evaluated during a pilot study with two outside participants similar to those who were used in the study. The interviews began with a brief introduction given by the researcher stating the purpose and objectives of the study. The participants were asked if an audio recorder could be used for interviews and all participants agreed to be put on record. Verbal consent was given followed by signing of the consent form by the participants.

A grand tour question stating "*Tell me of any childhood illnesses that you think can spread to other people and how can children be protected from these illnesses?"* was used to direct the discussion to some extend so that the required information was obtained. An interview guide was used. The interview guide helped the researcher to ensure that the same general questions of the phenomenon under study are collected from each participating caregiver. Flexibility from participants' responses was allowed to maintain characteristics of the unstructured qualitative interviews. Participants used the word ***'injections'*** referring to ***vaccines*** and ***immunisation services***. Therefore, to suit the level of understanding of each participant, the grand tour question was modified. The interviews were set at the convenience and comfort of the participants considering the amount of information which each participant shared. Hence, the interview sessions varied between 15 – 30 minutes depending on participant's willingness to continue with the conversation.

Probing questions were asked to obtain clarity on participants' responses when necessary. The researcher remained open to questions that emerge from studying the phenomenon and allowed the text to speak, the answer are then found in the text. In addition, the Road-to-Health Booklets/Cards (RTHB/C) were utilised to check for completeness and correctness of immunisation schedule as well as for identifying the appropriate use of all available opportunities for immunisation. A complete description of non-verbal communication was recorded in the form of field notes. The introductory statement was as follows:

"I am the Master of Public Health student that contacted you earlier to confirm the interview arrangements. I am conducting research on the perceptions of caregivers with regard to vaccine-preventable diseases in the City of Tshwane, as part of a requirement for the completion of a Master's degree. Are you still comfortable on going ahead with the interview?"

4.3. SAMPLE DESCRIPTION

4.3.1. Participants' biographical details

The four major constructs of perceptions as mentioned in Chapter 2 are modified by other variables such as educational level, age, experiences, skills and motivation to name a few that influence behaviour. Therefore, the researcher intended to explore these modifying variables as they influence caregiver's perceptions on vaccine-preventable diseases. This study collected sample statistics with respect to participant's age, gender, marital status, educational level, employment status, relationship of participant to a child, other participant's minor dependants, age and gender of the child with RTHB/C, child's immunisation and chronic medical status. All participating caregivers were biological parents of the children with an exception of one who was a grandparent to the child.

Table 4.1 Frequency distribution of the demographic characteristics of participants (n=21)

CHARACTER	VALUE	FREQUENCY	PERCENTAGE		CHARACTER	VALUE	FREQUENCY	PERCENTAGE
Age in years	10-19	-	-		Employment	Permanent	4	19%
	20-29	8	38%			Contract	3	14%
	30-39	12	57%			Temporary	1	5%
	40-49	-	-			Unemployed	10	48%
	≥ 50	1	5%			Self - employed	2	10%
Gender	Male	-	-		Religion	Christian	20	
	Female	21				Tradition	1	
Marital status	Single	15				Muslim	-	-
	Married	5				Hindu	-	-
	Divorced	-	-		Residence	Formal	15	
	Widowed	1				Informal	6	
Education level	No school	-	-		Dependants	< 1 year	11	
	Grade 1-7	4				1 -5 years	15	
	Grade 8-2	14				6 - 12 years	15	
	College	3				≥ 13 years	6	
	University	-	-					

4.3.1.1. *Participant's age*

Of the 21 participants, majority 57% (N=12) were between 30 - 39 years old. Those between aged 20 - 29 years constituted 38% (N=8) of the participants in this study. These findings closely reflected the proportions of the women at child bearing age in the district (see **Figure 1.1**). Although the data collection tool of the researcher disaggregated age of participants into five (5) groups, two groups of 10-19 years and 40-49 years were unavailable during data collection period. The following figure reflects the age groups of participating caregivers.

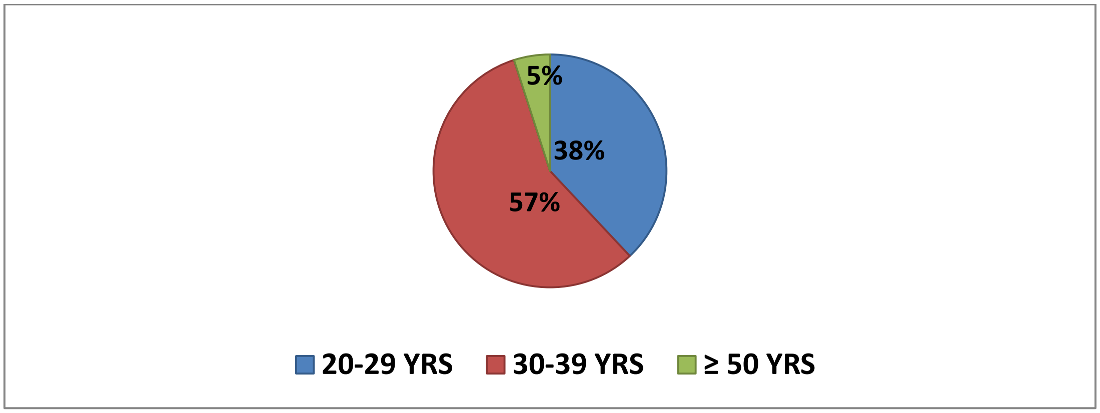

Figure 4.1 Distribution of participants by age

4.3.1.2. *Child Gender Profile*

All participants interviewed were in possession of a Road to Heath Booklet/Card (RTHB/C). This record was checked for completeness and correctness of immunisation schedule with the median of 3.5 and 52% majority of children were females. On contrary, the population of the district show more males than females aged less than 5 years in both 2012 and 2014. In 2012 population of less than 5 years were at 50.6% and 49.4% for males and females respectively. During the data collection year in 2014, population of less than 5 years for males and females was at 50.4% and 49.6% respectively. The next figure reflects the distribution of the RTHB/C based on the child's gender.

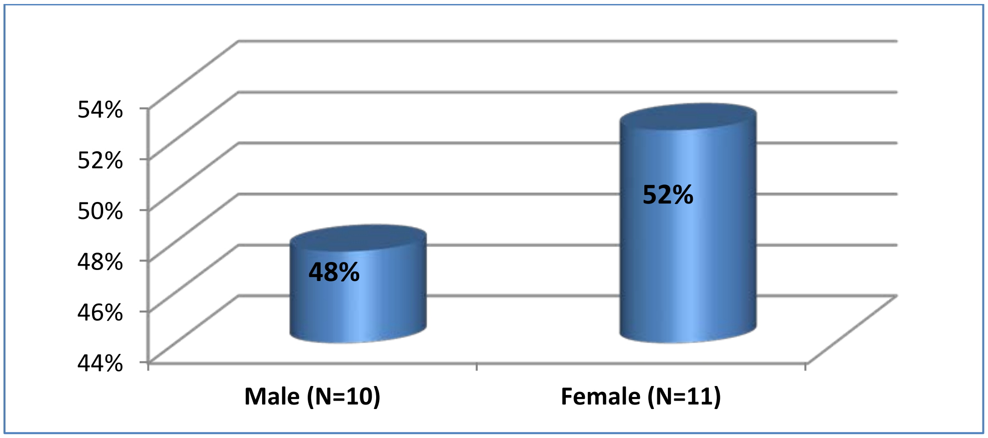

Figure 4.2 Distribution of Road to Health Booklets/Charts based on the child's gender

4.3.1.3. *Immunisation status*

Use of these clinical records (RTHB/C) assisted the researcher to classify participating caregivers into four groups. The four groups are (1) complete immunisers (caregivers with a child who is up to date with all eligible EPI vaccine doses); (2) incomplete immunisers (caregivers with a child who is behind the recommended immunisation schedule); (3) partial immunisers (caregivers with a child who missed one or more age appropriate eligible EPI vaccine dose) and (4) un-immunisers (caregivers with a child who is missing all age appropriate eligible EPI vaccine doses).

Majority were complete immunisers at 29% (N=6) from participants who aged between 30 and 39 years. The un-immunisers were not found among all age groups of participants in this study. Contrary, a study conducted in Nepal found complete immunisers at 86% and un-immunisers at 11% among caregivers ranging from 18 to 55 years of age (Matsuda 2002: 23).

The comparison between immunisation status of child and the participants' age group is summarised below in Figure 4.3:

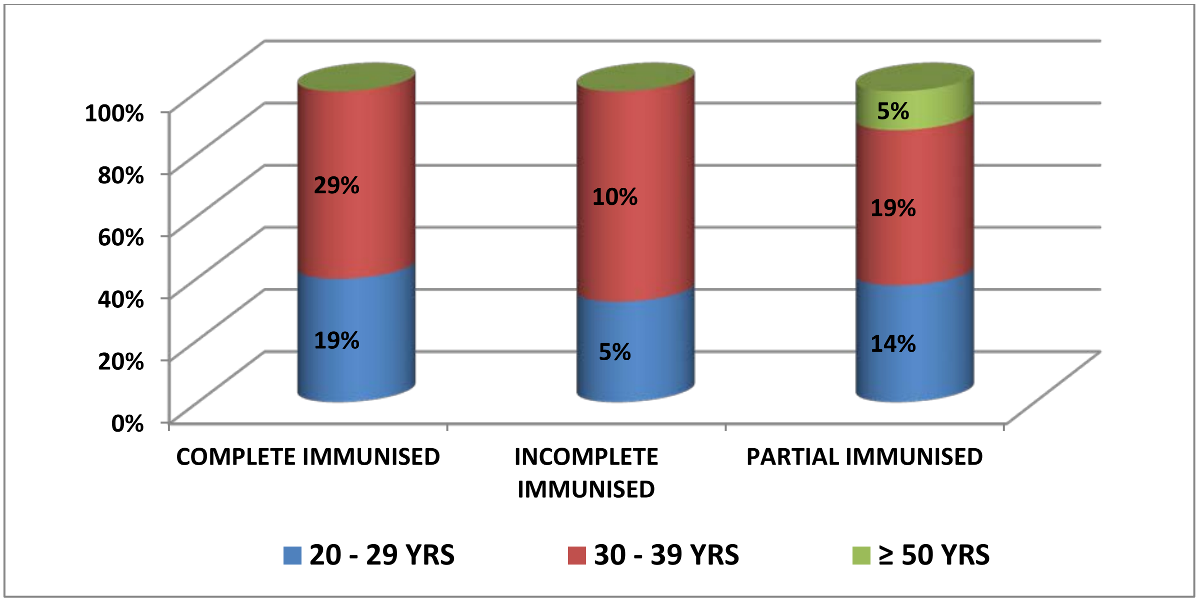

Figure 4.3 Comparisons of child's immunisation status and the participants' age group

4.3.1.4. *Modifying variables*

Table 4.2 shows other modifying variables that influence perceptions of caregivers with regard to vaccine-preventable diseases on completing immunisation schedule in this study.

Table 4.2 Distribution of immunisation status of the child with regard to participants' modifying factors

Child Immunisation status	No. of Children	Participant's Employment Status					Educational Level			Marital Status		
		Permanent	*Contract*	*Temporary*	*Self-employed*	*Unemployed*	*Grade 1-7*	*Grade 8-12*	*College*	*Single*	*Married*	*Widowed*
Complete	**48%**	**10%**	**5%**	**5%**	**5%**	**24%**	**5%**	**29%**	**14%**	**29%**	**19%**	**0%**
Incomplete	**14%**	**0%**	**0%**	**0%**	**0%**	**14%**	**5%**	**10%**	**0%**	**14%**	**0%**	**0%**
Partial	**38%**	**10%**	**10%**	**0%**	**5%**	**14%**	**10%**	**29%**	**0%**	**29%**	**5%**	**5%**
None	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**	**0%**
TOTAL	**100%**	**19%**	**14%**	**5%**	**10%**	**52%**	**19%**	**67%**	**14%**	**71%**	**24%**	**5%**

In relation to modifying factors, the characteristics for majority of complete immunisers were single with educational level of grade 8-12. The majority of unemployment status was at 24% in complete immunisers followed by 14% in both incomplete and partial immunisers. In addition, 14% were among those with college education and 10% among permanently employed. Of the demographic variables, several studies found maternal education being a significant predictor in completing immunisation schedule (Bofarraj 2011: 30; Kapoor & Vyas 2010: 12 - 15; Matsuda 2002: 23). However, findings in this study reveal no significant differences between level of education and immunisation status.

4.4. THEMES REVEALED DURINGTHE ANALYSIS OF QUALITATIVE DATA

The steps of data analysis described in chapter 3 included reading and understanding the transcripts, writing down the emerging ideas, creating codes, regrouping codes, creating categories, and themes (Brink 2001: 192 - 193; Polit & Beck 2012: 558 - 559). Therefore, the researcher read and re-read transcripts and listed the emerging ideas. She then created codes, categories and sub-categories from the listed ideas.

Themes were generated from these categories. The transcripts were also given to a public health specialist, who was also an expert in qualitative research methodology to independently create codes and categories, and identify emerging themes. After data reduction into themes, categories and sub-categories, the discussion of each theme and sub-category was done and supported with appropriate literature. Four themes were identified and are presented in Table 4.3 below:

Table 4.3 Summaries of the themes, categories or sub-categories

THEMES	CATEGORIES	SUB-CATEGORIES
4.4.1. Participants' knowledge about Vaccine Preventable Diseases (VPDs)	Participants verbalised basic knowledge or general understanding about VPDs	4.4.1.1. General knowledge on naming vaccine preventable diseases and other infectious diseases 4.4.1.2. Knowledge and awareness about mode of transmission for vaccine-preventable disease 4.4.1.3. Knowledge and understanding about prevention of vaccine preventable diseases
4.4.2. Participants' views of seeking health care	Participants verbalised reasons for visiting immunisation clinic	4.4.2.1. Awareness of children being at risk to VPDs 4.4.2.2. Opinions on the effects of VPDs 4.4.2.3. Views on visiting immunisation clinic 4.4.2.4. Reasons for keeping appointment of immunisations schedule
4.4.3. Perceptions on access to immunisation services	Participants verbalised conditions that facilitate or prevent them from visiting immunisation clinic	4.4.3.1. Feelings associated with visiting immunisation clinic 4.4.3.2. Attitudes of health workers associated with immunisation services. 4.4.3.3. Barriers in getting immunisation services
4.4.4. Participants opinions on solutions to improve immunisation services	Proposals on improving access to immunisation services	4.4.4.1. Solutions to missed immunisation opportunities 4.4.4.2. Solutions to increase demand of immunisation services

4.4.1. Theme 1: Participants' knowledge about Vaccine Preventable Diseases (VPDs)

Knowledge is defined as "an awareness or understanding of someone or something, such as facts, information, descriptions, or skills which is acquired through experience or education by perceiving, discovering or learning" (Oxford Dictionary 2010, sv "knowledge"). Based on this definition, for knowledge to be complete there must be three processes: learning, becoming aware of the phenomenon or matter, and expressing what has been learnt. The definition of knowledge highlights that, if a person is knowledgeable on a matter, such knowledge will be demonstrated or expressed. Therefore, this theme relates to establishing the basic knowledge of participants with regard to infectious diseases and vaccine-preventable diseases.

To simplify and guide the interview sessions, a grand tour question ""*Tell me of any childhood illnesses that you think can spread to other people and how can children be protected from these illnesses?"* was asked. Whilst bearing in mind those who would use simple terms, this question allowed participants to elaborate on their general knowledge and understanding. Three sub- categories emerged in relation to this theme.

4.4.1.1. Sub-Category 1: General knowledge on naming infectious diseases and Vaccine Preventable Diseases (VPDs)

Some of the participating caregivers cited that health workers never informed them about VPDs and the names written on RTHB/C seemed unfamiliar to them. The most commonly mentioned condition was Measles and less frequently, Polio as VPDs while HIV was frequently mentioned as a vaccine-preventable disease. Participants cited:

> *P8: "We were told about chicken pox; TB; rash or any illness that the child may get from the crèche. I just know that there is Measles but I cannot tell anything about it".* (Incomplete immuniser)

> *P10: “I only know of measles. I don't know anything about Polio; I just remember that at some stage we were called to bring our children to be vaccinated against Polio”* (Partial immuniser)

> *P21: “The only ones I know from the clinic card (RTHB) is Polio, Measles and Vitamins. Others I only see alphabets”.* (Complete immuniser)

Participating caregivers were concerned that health workers do not inform them about vaccines children are getting. Some participants mentioned ‘flu’ as non-VPD while others cited it as a VPD. On probing, participating caregivers described ‘flu’ as common colds and coughs in children. One participant cited:

> *P19: "I know of Measles and Flu. Health workers do not tell us about these diseases, they just inject our babies*". (Partial immuniser)

TB and diarrhoea were regarded as non-vaccine preventable diseases by some participating caregivers. Most often, others reported Salt Sugar Solution (SSS) as the only way of preventing diarrhoea in children.

> *P8: “I don't know if the child can get injections to prevent diarrhoea but I know that the child will be given solution if is having diarrhoea. Health workers don't tell us anything about why they inject children, they just inject them”.* (Incomplete immuniser)

Moreover, misconceptions arose when some participants mentioned that Polio is the same as Measles while others thought of Polio and Vitamins being the same.

One participating caregiver said:

> *P16: “I think Measles and Polio are the same. The child with Measles starts by becoming very hot then later develop rash. ..... I just remember that at some stage*

> *we were called to bring our children to be vaccinated against Polio".* (Incomplete immuniser)

Participants refer to Vitamin A as drops that are given when a child is six months old. The routine schedule of Vitamin A supplementation starts at six (6) months of age which is followed by nine (9) months routine vaccination. Since the Vitamin A schedule is within the administration period of routine vaccination, participants commonly mentioned it as a vaccine. One participant statement is as follows:

> *P18: "I know of the drops which the child gets at 6 months. I know that the child gets Vitamins. I think these vitamins are Polio".* (Partial immuniser)

Although majority of participating caregivers commonly mentioned HIV and TB as infectious diseases but not as VPDs, some lacked knowledge associated with conditions.

> *P15: "I don't know which disease children can get".* (Complete immuniser)

Chapter 1 described ten (10) antigens against Vaccine Preventable Diseases targeted by the Expanded Programme on Immunisation in South Africa (EPI-SA) routinely. However, only six (6) of the VPDs were mentioned while Pertussis, Diphtheria, Hepatitis B and Tetanus were never mentioned. The least mentioned conditions regarded as VPDs were TB, Meningitis, Pneumonia and Diarrhoea as they were all mentioned once. Human Papilloma Virus was also never mentioned despite the national vaccination implementation and launch in February and March, which happened less than six months before data collection period.

4.4.1.2. Sub-Category 2: Knowledge and awareness about mode of transmission for Vaccine-Preventable Diseases

The responses from the participants in this sub-category are congruent with the *Perceived Susceptibility* construct of the Health Belief Model (HBM). In elaborating on the mode of transmission for infectious diseases that can be prevented by vaccines, few participants mentioned “poor hygiene, close contact, cough, unsafe water and poor treatment adherence” as the modes of transmission.

The following is a statement from one of participating caregivers:

> *P4: “I really do not know how children can get these illnesses. But I think they can get them from their parents or from anyone living in the same yard with the child”.* (Partial immuniser)

Of those who were able to identify the mode of transmission, majority correctly mentioned Measles to be transmitted through “close contact”. Another participant used the word ‘fly’ referring to droplet transmission:

> *P1: “For measles I know that if an infected child plays with uninfected one, and two children are in close contact measles will 'fly' to the uninfected child”.* (Complete immuniser)

> *P14: “According to my knowledge measles is spread through close contact with the infected person just like chicken pox”.* (Complete immuniser)

Cough, close contact and poor treatment adherence were commonly reported as mode of transmission for TB. Some participants cited:

> *P8: “Children can get TB from coughing; they get chicken pox when they are close to each other”.* (Incomplete immuniser)

> *P12: “A child can get TB from someone who is infected with TB and stays in the same house with the child. Especially if the infected person does not put on a mask then TB will spread faster. The only time a child gets HIV is when the mother start treatment very late. It is caused by bacteria, dust and unclean environment”.* (Complete immuniser)

The findings revealed that other participating caregivers were having misconceptions about the mode of transmission and prevention against some VPDs. Three participants indicated:

> *P17: "I think children get Polio if they drink unsafe water".* (Incomplete immuniser)

> *P14: "I believe injections can prevent HIV because HIV positive mothers give birth to HIV negative children. I think those injections the mother got during pregnancy prevented the child from getting HIV"*. (Complete immuniser)

> *P6: "Since children are getting injections they no longer get scabies, diarrhoea and sores all over the body even Measles does not become severe".* (Partial immuniser)

Other participating caregivers also lack knowledge associated with mode of transmission.

> *P15: "I don't know because we were not told what will happen to those children".* (Complete immuniser)

4.4.1.3. Sub-Category 3: Knowledge and understanding about prevention of vaccine preventable diseases

This sub-category is in line with the *Perceived Benefits* construct of the HBM. With regard to the prevention of vaccine preventable diseases, some of participating caregivers perceived vaccines to be important in preventing diseases.

Participants believe that immunisation is an important intervention to prevent infectious diseases. The word 'injections' refer to 'immunisation' according to the participants' level of understanding (lay man term). Most participants believe that an immunised child can be protected from getting many infectious diseases.

With regard to knowledge about the word "immunisation", participants cited:

> *P14: “I think it is about injections that prevent infections. A child who received these injections can still contract the disease but the infection will not be severe unlike the child who has never received them (vaccines).* (Complete immuniser)

> *P20: “Immunisation is a process to inject children during certain period which are established by the Department of health. I think is the period when the children are vulnerable to diseases. It also prevents certain diseases at the certain age group”.* (Partial immuniser)

A probing question relating to prevention of VPDs was asked to simplify the term “immunisation” for those who were unable to conceptualise/understand it. Preventing factors mentioned by participating caregivers included “prevention of diseases”, “clean environment”, “isolating an infected child” and “lessening effects of diseases”.

Probing question:

Tell me why children are getting injections (vaccines)? Here are some statements following probing question:

> *P9: “To prevent measles infection by injecting children when they are at risk of measles. I think other diseases can be prevented if the child lives in a clean environment and there is no runny water in the streets.”*(Complete immuniser)

Participants mentioned clean environment as a way to prevent VPDs. They mentioned ‘clean environment’, ‘not living in dirty environment’, ‘avoiding runny water in the streets’. They cited environment and vaccines to be important in providing dual protection against VPDs.

> *P12: “You as a parent you must ensure that the child lives in a bacteria-free environment because immunisation alone will not protect infectious diseases. I think cleanliness of environment should be paired with immunisations to prevent diseases.”*(Complete immuniser)

As discussed earlier in chapter 2, the HBM proposes that individuals who perceive a given health problem as serious are more likely to engage in behaviours to prevent the health problem from occurring. This proposal is also supported in Tuma et al (2002: 55 - 61) when alluding that the ability for identifying risks depend on the person's level of understanding for a specific condition. On contrary, findings in this study reveal no significance differences between knowledge and completeness of immunisation schedule.

4.4.2. Theme 2: Participants' views of seeking health care

Chapter 2 discussed factors associated with whether or not a person engages in some form of health behaviour. Among these factors, the person's perception of control was seen as the subjective determination of the ability in seeking health care (Wallston [Sa]: 151). The HBM suggests that people's perceptions or beliefs explain engagement or lack of engagement in health promoting behaviour.

According to Matsuda (2002: 9) the HBM in context of health-related behaviour depend mainly upon two variables: (1) the desire to avoid illness (or if ill, to get well); and (2) the belief that a specific health action will prevent illness. Ferguson and Bargh (2004: 34-36) argue that perception activates social knowledge automatically and can influence people's judgments which influence behaviour because it can guide the categorisation of judgment-relevant stimuli.

In view of these factors that influence behaviour, caregivers play a vital role in the uptake of immunisation by children under their care. It is often necessary to take children to the health facility for vaccination since they cannot do so by themselves. Caregivers' perceptions of immunisation are therefore an important determinant of whether or not they will avail their children of immunisation services. Theme 2 therefore explores some of the views verbalised by caregivers for visiting immunisation clinic. Four sub-categories emerged from this theme.

4.4.2.1. Sub-Category 1: Awareness for children being at risk to vaccine preventable diseases (VPDs)

This sub-category also focuses on the construct of Perceived susceptibility/risk and self-efficacy of the HBM. It is logical to think that when people believe they are at risk of a disease, they will be more likely to do something in preventing it to happen. One will expect caregivers who perceived risk of contracting VPDs to the ability of getting their children completely immunised. Unfortunately, the opposite also occur. Incomplete and partial immunisers also verbalise that their children were at risk of VPDs.

Participants used words such as ‘young age’, ‘unimmunised child’, ‘caregivers’ traits (laziness, selfishness)’ associated with children to be at risk with vaccine-preventable diseases. One participant associated bad mothering with risk of VPDs in children. Again, participants mentioned vaccination to be important in protecting children from infectious diseases.

Statements from **complete immunisers**:

> *P9: “Measles can be prevented by injecting children when they are at risk of measles. I think other diseases can be prevented if the child lives in a clean environment and there is no runny water in the streets”.*
>
> *P21: “I think children can get Polio and Measles quite easily because they are still young”.*

Statements from **incomplete immunisers**:

> *P8: “Injections help the child not to contract diseases because he is still young. When playing with other children he will get infected because the child did not get his injections”.*

> *P16: "I know about Polio injection, the child does not get very ill if injected with Polio. These injections protect children from many diseases"*

Statements from **partial immunisers**:

> *P10: "A child who contracted measles and did not get measles injection will be severely sick than the child who has been injected against measles"*

> *P18: "The child will have bloated tummy and can get diseases easy. The bones also become weak"*

The belief that bad mothering makes a child vulnerable to illness was confirmed by some participants where responsibility was put on caregivers who are 'careless', 'selfish', 'lazy', 'left their children with other caregivers' or 'who become deeply hurt during pregnancy with the troubles of the family and then shifted their focus to the child'. The following statement highlights what has been said:

> *P12: "I think they (caregivers) have been motivated enough; they just don't want to bring their children…. they don't want to be told what to do or not to do. Some are just lazy or selfish because if the mother is no longer in good terms with the child's father, she feels overburden on taking care of the child which end up in negative competition on the expense of the child. Sometimes others will tell you that they (mothers) never planned for the pregnancy although they (mothers) still want to keep their children with them".* (Complete immuniser)

4.4.2.2. Sub-Category 2: Opinions on the effects of vaccine preventable diseases (VPDs)

Participants who verbalised severe illness or disability or death tend to perceive the disease as serious. Despite having knowledge about the causes and consequences of VPDs and knowing that immunisation can prevent disability or death, some caregivers are still not completing the immunisation schedule for their children. Hence, the statements below are from some of participating caregivers who were classified as complete, incomplete, or partial immunisers:

Statements from **complete immunisers**:

> *P15: "The child with measles gets healed. This has happened with my aunt' children where they were kept indoors because it is said children with measles should not be exposed to the sun or be outside in the air. They were kept indoors and got healed from measles".*

> *P21: "Measles attack meninges of the brain and it can be very deadly to a child. Polio I don't know much about it, but I think children develop rash".*

Statements from **incomplete immunisers**:

> *P8: "If you let the child with chicken pox to stay outside the house for longer period, the rash will get absorbed inside the body and the child will die. The child who is having TB and is not on treatment will die".*

> *P17: "People who don't take care of TB will not live".*

Statements from **partial immunisers**:

> *P6: "A child who did not receive his injections may be physically disabled at a later stage when the child is an adult. A child may have legs which are not working properly because of lacking injections during childhood".*

> *P7: "The child with diarrhoea will have …… allergic to something. Measles does not become severe, a child with measles will just develop fine rash and after a while it just disappear".*

4.4.2.3. Sub-Category 3: Views on visiting immunisation clinic

The findings reveal that participants held various views on attending immunisation services. Some of the views are either in line or contrary to the departmental goals of preventing VPDs by sustaining high coverage and lowering drop-out rates. On the other hand findings from the study conducted by Etokidem and Wondifon (2013: 3) was that 1% of the focus groups held positive opinion about immunisation stating absence of immunisation will lead to very high mortality in children.

Participating caregivers raised concerns about lacking information with regard to which vaccines the child is suppose to get and reasons for these vaccines. Participants reported that low uptake of vaccination is due to lack of information about which vaccines are due. The following statements were reasons of bringing their children to immunisation clinic:

> *P7: "Oh yes! I think sometimes you bring your child to get his injections and you only find out that the child will be given some oral drops and weighed but not getting injections. Some people see these services of weighing and giving of drops not to be important and they end up not bringing their children to clinics. I think sometimes is lack of knowledge and understanding on these kind of tasks and some people end up undermining them".* (Partial immuniser)

> *P20: "I was told to bring her; I think it's a must to bring a child for immunisations. Injections will also make sure that the child grows well".* (Partial immuniser)

Some participants verbalised what other people says about immunisation services:

> *P12: "Some mothers think that it is not necessary to bring children for injections because children still grow well without them (vaccines). One parent told me that she never brought her children for injections and nothing happened to them (children) and so she does not see any reason for these injections".* (Complete immuniser)

Although immunisation is not compulsory in South Africa, some participants take it as lawful to get their children to be vaccinated:

> *P10: "I think it is important for the child to get her injections. I just think it is by law because if the child didn't get injections you as a parent you will experience some problems when the child is ready to start school or crèche. I know about measles that children will not get very sick if they have been injected".* (Partial immuniser)

> *P13: "I brought my child because I see it to be a procedure which should be followed. At the same time I think injections prevent diseases which I don't know. The department of health knows why children should get injections".* (Complete immuniser)

4.4.2.4. Sub-Category 4: Reasons for keeping appointment of immunisations schedule

The researcher wanted to establish reasons for keeping appointments and consequences of missing immunisation sessions. In line with self-efficacy construct of the HBM, participants reported uncaring attitudes of health workers, clinic operating times and personal commitments contributing to missed immunisation sessions. The reasons for perceived benefits and perceived barriers led caregivers to either keep or miss immunisation sessions. Two participants from complete and partial immunisers stated:

> *P6: "It is absolutely not ok to miss appointments. At the same time I blame myself because I missed my previous schedule date due to some challenges I had on that day. But now, they (health workers) need to be blamed because today I came and I didn't get help from them. I cannot say much because the problem also lies with us (caregivers) because we miss our appointments".* (Partial immuniser)

> *P21: "I think immunisations help but it is very tricky to follow the schedule if you are a working mother. Otherwise we would die if they (vaccines) were not there. It is tricky because you rely on someone else to bring your child for immunisation. Once*

> *you miss any of them (vaccination doses), nurses will shout at you badly".* (Complete immuniser)

Thus, for keeping with immunisation schedule, participants showed abilities of taking actions to get new appointments for visiting immunisations clinic. However, they felt threatened by their current situations (personal commitments and employment) and believed that creating an enabling environment will be beneficial in protecting their children from VPDs.

4.4.3. Theme 3: Perceptions on access to immunisation services.

Theme 3 focuses on access to healthcare services which is determined by the cognitive factors and challenges in getting immunisation services. A number of studies have affirmed the cognitive factors as the contributory factor to missed opportunities. In addition, the United State Agency for International Development (USAID) describes obstacles such as poor services, malicious rumours or false beliefs that keep caregivers from using immunisation services (USAID 2003: 45 - 47). On the other hand, Savedoff (2009: 5 - 9) argue that access is influenced by the probability that someone can get a health care service when they need it and a range of perceptions of the population as to whether certain conditions are amenable to treatments that are available in the local community.

Three sub-categories emerge from this theme.

4.4.3.1. Sub-Category 1: Feelings associated with visiting immunisation clinic

Participants verbalised various feelings during their initial and subsequent visits to immunisation clinic.

Some participants felt anxious with their initial visit and later verbalised comfortable feelings with subsequent visits. One participant said:

> *P2: “I was afraid with the first child, I felt like going back home because I was anxious about the pain he will feel from injection. But with my second child I just felt is something which should happen”.* (Complete immuniser)

Some participants were concerned about the number of injections the child would get during one immunisation session. These brought anxiety or fear in visiting immunisation clinic and is reflected as:

> *P7: “I felt anxious with those injections because they are horrifying. At times the child will get three injections on the same day”.* (Partial immuniser)
>
> *P12: “I felt like dying after I read on the card that my child will get 2-3 injection because I do not like injections myself”.* (Complete immuniser)

Other participating caregivers felt excited about the importance of vaccines in preventing diseases.

> *P16: “I am just excited about these injections because nowadays there are lot of diseases, last year we were told about meningitis. To give children injections is the best thing to do because some of the diseases we don't know about them and how they present”.* (Incomplete immuniser)

Rumours played a role in causing ill-feelings from participating caregivers.

> *P21: “I was scared because he was so tiny. Some people would tell you children cry a lot and don't sleep after injections. I thought the child would have constant pains, I was really nervous about both of us. I was wondering how I was going to handle him after injections”.* (Complete immuniser)

The age of motherhood also played part in bringing anxiety to some participants with their initial visits.

> *P1: "With my first child I was afraid because I was still young but with my second child I don't have stress any more".* (Complete immuniser)

> *P8: "I was afraid that the health workers will shout at me. They would say I made babies at the young age".* (Incomplete immuniser)

Participants verbalised words such as 'fine, happy, no stress, excited' for feeling comfortable in visiting immunisation clinic while words such as 'afraid, anxious, scared' were commonly used to verbalise anxiety/fear in bringing their children to get vaccinated.

4.4.3.2. Sub-Category 2: Attitudes of health workers associated with immunisation services.

This sub-category focuses on Perceived barriers and Perceived Benefits of the HBM. Chapter 2 discusses in detail that perceived benefits must outweigh the perceived barriers in order for behaviour change to occur. Plumridge et al (2008:2) sees the interaction between a nurse and a caregiver during immunisation sessions to be crucial in meeting goals of the immunisation programme.

> *P8: "Nurses don't care about us and our feelings. They (nurses) leave your child undressed for longer periods in a cold weather while they are busy writing in their books before giving injections. It is also better if they will see three of us at the same time to speed up the process. In other clinics they (nurses) will tell us that we like flocking to the clinic".* (Incomplete immuniser)

> *P13: "….I cannot think of anything else because I am satisfied with the care I receive in this clinic. I don't know about other people".* (Complete immuniser)

> *P21: "I just wish nurses would be nicer to people. When you think of coming to the clinic, you become so anxious and you decide to see the private doctor. Going to the private doctor is also challenging because of finances. The way nurses talk to*

> *people it is like you invade their space. Nurses should be nicer and approachable".* (Partial Immuniser)

The researcher found no significant difference on completing immunisation schedule by participating caregivers despite health workers' positive or negative attitudes during immunisation session since majority were complete immunisers. Caregivers who are affected by attitude of health workers were reported to be other caregivers who were not participants in this study.

4.4.3.3. Sub-Category 3: Barriers in getting immunisation services

This sub-category focuses on Perceived barriers construct of the HBM. Perceived barriers are regarded as the most significant in determining behaviour change. Even if an individual perceives a health condition as threatening and believes that a particular action will effectively reduce the threat, barriers may prevent engagement in the health-promoting behaviour.

Participants explained a number of conditions that complicates or prevents children from getting vaccinations. These conditions were associated with poor knowledge and position of caregivers, health status of caregivers, economical constraints and health system factors. These conditions will be examined below in three different categories:

(1) Conditions related to the poor knowledge and position of caregivers

Participants also verbalised that at times other caregivers are not knowledgeable about the importance of vaccines. They also pointed out bad behaviour of nurses towards them and their babies when they (caregivers) are visiting clinics for vaccination of their children. This is what they had to say about this problem:

> *P13: "Most of them (caregivers) do not know about the importance of these injections and sometimes is just ignorance."*(Complete immuniser)

> *P12: "We just have to be patient as clients because a sick person cannot strike. The nurses do not even wear name tags; you can't identify them even if you want to complain about them because it is hard to describe a person. I really don't know what exactly can be done to change the way things are happening in this clinic".* (Complete immuniser)

(2) Conditions related to health status and economical constraints

> *P15: "Most of them mothers are afraid to bring their children to the clinic if it happened that they missed their scheduled dates. They are afraid they (probably nurses) will shout at them and they (caregivers) will stop to bring their children for injections. Others (caregivers) have transport problems or sometimes they are sick to bring children to the clinic".* (Complete immuniser)

(3) Conditions related to the health system

Participants verbalised factors of the health system that are barriers for them for getting their children immunised. These included a number of factors ranging from lack of waiting areas to lack of services due to nurses attending meetings and on lunch during their (caregivers) visits to clinics. This is what they had to say about this:

> *P2: "The problem here is the prolonged waiting periods worsen by waiting outside in cold weather with the children. You leave home early and return late in the afternoon while children are hungry". (*Complete immuniser)

> *P12: "It is terrible here. We were informed that the clinic start operating from 07H30, you arrive early only to be told that the health workers are in a meeting from 07H30 until 12H00. After the meeting they (staff) will go for lunch or tea. If you can check my child's card, she missed her injections because on that particular date I requested time from work to bring her (child) for injections. I was at the clinic from 07H00 until 14H00 and did not get help from the staff. At times they shout so badly at children who enter their (staff) consulting room while playing. They*

> *(nurses) came to work but they don't want to do their job, they will just sit in the tea room talking about their own things".* (Complete immuniser)

The first three themes attempted to isolate factors that might affect both positive and negative immunisation behaviour by understanding the process involved that will assist in identifying strategies to change the negative perceptions in order for optimal utilisation of immunisation services. Conversely, as mentioned in chapter 2, Xu, Saksena and Evans (2010: 1) argue that people's perceptions to use health service in promoting health behaviour are still governed by supply and demand factors.

The next theme will look at suggestions made by participating caregivers to improve immunisation services.

4.4.4. Theme 4: Participants' opinions on solutions to improve immunisation services

This theme mainly focuses on cues to action and self-efficacy constructs of the HBM. Participants reported internal and external factors within these two constructs to improve immunisation services. However, the intensity of self-efficacy and cues that are needed for prompt action varies among individuals through their perceived susceptibility, severity, benefits, and barriers of the disease.

According to Plumridge, Goodyear-Smith and Ross (2008: 18) improving effectiveness of a health system depends mainly on empowering both health workers and their clients (patients) to develop 'adult–adult' rather than 'adult–child' relationships that respect and enable ethical principles of autonomy, accountability, fidelity and humanity. The authors see interaction between health worker and caregiver as utmost importance during delivery of immunisation services. On the other hand, the HBM predicts that individuals who perceive that they are susceptible to a particular health problem will engage in behaviours to reduce their risk of developing the health problem. However, Xu, Saksena and Evans (2010: 1) argue that health seeking behaviour is governed by economical factors, physical factors, social exclusion, marginalisation and cultural factors.

Two sub-categories emerge from this theme.

4.4.4.1. Sub-Category 1: Solutions to missed immunisation opportunities

With regard to solutions for health system factors pertaining to attitudes of health workers, participants envisage mutual understanding between health workers and caregivers to lower dropout rates in immunisation uptake. One participating caregiver cited:

> *P6: "Problem on missing sessions can be fixed through mutual understanding between us (community) and the staff (health workers). I mean I missed my child's injections date because of the challenges I heard, at least they (health workers) should listen and understand our situations".* (Partial immuniser)

With regard to solutions for health system factors pertaining to infrastructure challenges, participants verbalised frustrations of lacking sufficient waiting areas. They mentioned frustrations of waiting outside in bad weather with their young children while visiting immunisation clinics. Participating caregivers proposed building of a shelter to accommodate overflow of caregivers during immunisation sessions. One participant cited:

> *P2: "At least if they can build us the shelter where we can wait so that we do not wait outside in the bad weather".* (Complete immuniser)

With regard to solutions for health system factors pertaining to human resource shortages majority of participants proposed home visits by health workers to render immunisation services. In addition participants expressed challenges for shortage of health professionals while others mentioned adequate supply of administration personnel in the health facility. One participant stated:

> P14: *"At times you arrive in the clinic at 07H00 and you only go home after 14H00 while children are very hungry. There is a need of at least two or three additional doctors because presently there is only one doctor who is very slow in seeing patients. There is enough admin staff in the clinic, today they were about five to six*

> *of them but they are still very slow in helping us. The one who give out numbers is very fast and so I suggest that nurses should see us even if someone has not yet got clinic file. They (nurses) can record on papers then transfer the information later when the file is retrieved”.* (Complete immuniser)

> *P16: “Department of Health must assist people (caregivers) who are unable to bring their children for immunisations. They must visit home at least once a month or recruit volunteers to conduct home visits”.* (Incomplete immuniser)

Solutions pertaining to operational systems, caregivers cited:

> *P13: “It must just be compulsory for all children to get injections. The child who did not get injections should be denied health care if found to be sick. This will make caregivers to bring their children for injections because they (caregivers) will know that if the child did not receive injection they will not get help in the clinic when the child is sick”.*(Complete immuniser)

> *P19: “I think there should be inspectors to check reasons for poor treatment we receive in the clinics”.* (Partial immuniser)

With regard to solutions within communities, proposals pertaining to lack of health information and education prevail among participating caregivers’ comments. Majority of participants emphasised the need for continuous health education and information. Some participating caregiver cited:

> *P10: “I think health workers should continue to give health education for at least 30 minutes in the waiting areas especially with the first time mothers. When caregivers recall about these health messages they will decide to bring their children for injections as scheduled. Others they will still not bring their children because they do not see the need”.* (Partial immuniser)

> *P11: “By educating people the same way as nurses do when educating us about when to introduce solid food after delivery…..they (health workers) just have to continue giving health talks to people because our level of understanding is not the same. If you never experience pains you will not understand the intensity of pain. They (health workers) should keep on educating us maybe mothers will end up bringing children for injections”.*(Complete immuniser)

> *P20: “Education about prevention on health issues in a language that make them (caregivers) to understand. Nurses should talk to people in their own language to explain the importance of immunisation. They (nurses) should use "do” rather than "don’t “in their language to promote positive acceptance of messages. When they emphasise "don't", people may be resistant to change or become afraid”.* (Partial immuniser)

In terms of barriers on accessing immunisation services, home-visit was commonly mentioned to address missed opportunities. Participants verbalised statements such as:

> *P8: “I think nurses should visit people in their homes, check the children clinic cards to see if they are up to date with injections”.*(Incomplete immuniser)

> *P10: “I think nurses should visit homes to check on children who missed their injections and give these injections at their homes and others s should visit children at crèches to give them their injections. The government should get more staff for effective service delivery”.* (Partial immuniser)

Participating caregivers mentioned negative personal traits from other caregivers that contribute to missed opportunities. Participants verbalised door-door home visits as the best solution in addressing personal factors that affect immunisation uptake. Some caregiver cited:

> *P10: “Some of them they do not see importance of bringing children to get injections while other caregivers are just lazy or get tired on coming to the clinic. I*

> *think nurses should continue educating them about dangers of missing injections”.* (Partial immuniser)

> *P15: “I don't have anything to change except that nurse should do home visits which I think will work better because some of the people (caregivers) are just lazy to attend the clinic”.* (Complete immuniser)

Solutions to address missed opportunities looking at caregivers’ responsibilities, one caregiver:

> *P2:” The fact is that people who care about their children lives will bring them for injections. I brought my child because I care about his life”.* (Complete immuniser)

> *P18: “As parents we must take responsibility about our own children, the same way when our parents cared about us. As a parent you must make sure that the child get injections on time and not to leave until when the child is about to start school. Sometimes we (caregivers) also contribute to the negative attitudes of nurses towards us”.* (Partial immuniser)

4.4.4.2. Sub-Category 2: Solutions to increase demand of immunisation services

Participants proposed strategies such as a need for health workers to attend community meetings, health workers to conduct door to door visits, establishing effective reminder system and continuous health education- includes providing information, education and communication (IEC) materials.

Attending community meetings, one participant said

> *P21: “The easiest way is to attend annual general meetings normally held in crèches or any big community event. In these meetings, health messages should be part of their agenda which include giving out of pamphlets or reminders about*

> *health messages. I wish to change the conduct of nurses. Number one is communication. This means that the receptionist must be able to guide you (client/caregiver) and the staff must be able to put smiles on their faces. I will take them (nurses) for team building sessions. Secondly, I will take them for change management. Thirdly I will teach them basic etiquettes to liaise with people like answering of telephones, conduct on how to dress, how to apply make-up and how to talk to people. Lastly, I will have sign posts in the clinic to guide a person in different sections of the clinic like doctor's room and toilets".* (Complete immuniser)

Conducting home visits, some participating caregivers cited:

> *P6: "This can be done through door-to- door home visits where health workers will request and check children clinic cards. There are some people who visit us who I think they are social workers because they only ask about people who are sick. I and some of my neighbours feel that if these people can also check children clinic cards, it was going to much better. I know of one of my neighbour who is not bringing her child to the clinic at all despite several request made to her by some of us including her own mother".*(Partial immuniser)

On establishing effective health reminder system, participants mentioned reminder system to be in place for immunisation services.

> *P21: "People need constant reminders. It happened to me that I missed immunisation date once but I was able to catch-up. At times the child needs to be consulted on various occasions for illnesses and you (caregiver) tend to forget about immunisations but focus on the sickness. It will be better to have a system which will remind people about return dates for immunisations".* (Complete immuniser)

Participants commonly mentioned continuous education to increase demand of immunisation services. Statements from participating caregivers include:

> *P10: I think health workers to continue to give health education for at least 30 minutes in the waiting areas especially with the first time mothers. When caregivers recall about these health messages they will decide to bring their children for injections as scheduled. Others they will still not bring their children because they do not see the need".* (Partial immuniser)

> *P21: "People need continuous education because it seems health workers took immunisations for granted. They health workers no longer push the services like before because of assuming that people are now used to immunisation services. They (health workers) must do the same way as they do with HIV to have flyers and messages".* (Complete immuniser)

4.5. OVERVIEW OF RESEARCH FINDINGS

The researcher established that knowledge on vaccine preventable diseases was very minimal among majority of caregivers. This implies that community awareness programmes should be intensified in order for the Department of Health to meet goals of the immunisation programme. Different strategies are required to target different age groups with health information and education. Waisbord & Larson (2005: 10) believe on the promotion of immunisation through community networks to be proven means on building trust and acceptance of vaccines. These authors further explain that caregivers are most likely to trust other community members when they make decisions about the health of their children.

The findings revealed perceived barriers to dominate among partial and incomplete immunisers. Despite lack of health information and education, majority of complete immunisers adhered to immunisation schedules due to their perceptions in the severity of VPDs and benefits of immunisation programme. However, findings reveal that caregivers' perceptions or cognitive factors play an important role for having children completing vaccination schedules to protect the public from vaccine - preventable diseases. Most crucial is that incomplete vaccinations or sub-optimal levels of immunisation coverage are very important issues, since they represent inappropriate periods of vaccinations which lead to inadequate protection against vaccine-preventable disease.

4.6. CONCLUSION

Some caregivers do not come regularly for vaccination of their children. As a result they miss the due date of vaccination. Majority of participating caregivers did not know about the diseases for which their children are being immunised but some of them still follow the immunisation card & come accordingly. So there is a dire need to arrange for health education program sessions for caregivers with main emphasis on importance of vaccination & Vaccine Preventable Diseases (VPDs). MomConnect and media can be used effectively for spreading health education messages.

The researcher concluded that caregivers' beliefs and overall knowledge influence their perceptions towards vaccine preventable diseases. It is interesting to note that the majority of caregivers recommended door-door visits (home visits) to improve immunisation uptake by communities. Conversely, Xu, Saksena and Evans (2010: 1) argue that people's perceptions to use health service in promoting health behaviour are still governed by supply and demand factors. The authors describe supply and demand factors to be related to financial affordability, physical factors, social exclusion, marginalisation and cultural factors. This concept supports the statement that stagnation in immunisation coverage or under-utilisation of immunisation services ranges from infrastructural problems of health delivery systems to funding pressures that divert resources away from routine immunisation (Waisbord & Larson 2005: 1). Health workers need to be trained and adequately supervised to ensure that they give relevant and comprehensible information in a respectful and culturally sensitive manner.

CHAPTER 5

DISCUSSIONS, RECOMMENDATIONS AND CONCLUSIONS

5.1. INTRODUCTION

It is again vital for the researcher to mention that the purpose of the study was to explore and describe the perceptions of caregivers with regard to vaccine-preventable diseases in order to make recommendations to support caregivers in the usage of immunisations. Chapter 4 presented the research findings of the study. The researcher presented perceptions of caregivers with regard to vaccine-preventable diseases. In this chapter, the researcher focuses mainly on the conclusions, limitations and recommendations based on research findings discussed in the previous chapter.

5.2. DISCUSSIONS

The main aims of the researcher in this study were two-fold i.e. (1) to explore and describe the caregivers' perceptions with regard to vaccine preventable diseases and (2) to make recommendations for the promotion of vaccination usage among caregivers. The achievement of these objectives was facilitated by the application of the generic qualitative research design that is explorative, descriptive and contextual in nature. The application of the qualitative research strategy helped the researcher explore perceptions in a narrative manner that would have been difficult to identify using a quantitative research strategy. The use of in-depth individual interviews in data gathering helped the researcher to communicate with one individual or participant at a time, which facilitated secure environment.

During the in-depth individual interviews, the researcher asked grand tour question stating ""*Tell me of any childhood illnesses that you think can spread to other people and how can children be protected from these illnesses?"* Participants used the word ***'injections'*** referring to ***vaccines*** and ***immunisation services***. Therefore, the grand tour question was modified to suit the level of understanding of each participant. Some caregivers had a fair basic knowledge about causes of VPDs as they even quoted the signs and symptoms, mode of transmission, management and how to prevent the diseases. However, emerging themes from the study indicate that the knowledge about the causes and consequences of VPDs was not a motivator to some caregivers in completing the immunisation schedule for their children. It is also noted that some of the caregivers were unsure of some aspects of vaccine-preventable diseases and needed some clarification on vaccines that are available for certain infectious diseases.

On the other hand, findings revealed that caregivers' perceptions or cognitive factors play an important role for having children in completing vaccination schedule to protect the public from vaccine- preventable diseases. The researcher is of the opinion that incomplete and partial immunisation among children represent inappropriate periods of vaccinations in the City of Tshwane. The sub-optimal immunisation coverage therefore leads to inadequate protection against vaccine-preventable disease and pose risks to VPDs outbreaks in communities.

It is noteworthy that some individuals have positive perceptions towards improving immunisation services, but unacceptable attitudes of health workers reported by caregivers cause psychological discomfort in the communities to utilise immunisation services at an optimum level. Hence, caregivers find health system factors disturbing and threatening to prevent vaccine-preventable diseases. Participating caregivers suggested increased resource allocation (human and infrastructural resources), increased awareness campaigns, improved attitudes and door-to door home visits to improve immunisation services uptake.

The followings sections present the summary of four themes emerged during data collection:

5.2.1 Participants' knowledge about Vaccine Preventable Diseases (VPDs)

The finding revealed that generally participating caregivers had a poor basic knowledge on naming at least half of the vaccine-preventable diseases of which vaccines are on their children’s clinic records (RTHB/C) which are provided immediately after birth. The correctly mentioned VPDs were measles, polio, tuberculosis, diarrhoea, pneumonia and meningitis. Participating caregivers described ‘flu’ as cough and common cold. On contrary, their description on ‘flu’ is not in line with the case definition of the condition. Influenza (flu) is a contagious respiratory illness caused by different group of influenza viruses (CDC Online: sv “influenza (flu)”). Symptoms tend to be more severe and last longer and it can cause mild to severe illness. Serious outcomes of flu infection can result in hospitalisation or death. It is a vaccine-preventable disease although not targeted by EPI-SA as a routine vaccine.

The findings on poor basic knowledge to name VPDs and their related vaccines corroborate those of a study conducted in Turkey which reveals that mothers were not able to name all of the vaccines that were in the national immunisation scheme (Topuzoğlu, Ay, Hidiroglu & Gurbuz 2007: 349). The authors further revealed that mothers also did not know which vaccines were administered to their children. On contrary, a study conducted in India (Ahmedabad) reveal maximum number of caregivers (85 %) who knew about Poliomyelitis while Measles & Tuberculosis was only 40% and 35 % respectively (Kapoor & Vyas: 2010: 12 - 15). In addition, an Italian study reveal the knowledge on vaccine preventable diseases among mothers with majority mentioning Hepatitis B (87%), Poliomyelitis (79.9%), Tetanus (74.4%), and 66.3% for Diphtheria (Angelillo, Ricciardi, Rossi, Pantisano, Mangiano & Pavia: 1999: 226).

In terms of the traditional epidemiologic triad model described in chapter 2, the mode of transmission occur either through direct or indirect route. (Friis & Sellers (2009: 438 - 439). However, the findings revealed that some participating caregivers were having poor knowledge and misconceptions about the mode of transmission for most VPDs. Conversely, findings in this study reveal that level of understanding about transmission of VPDs did not seem to influence participating caregivers in bringing their children for immunisations. This was evident particularly when majority of complete immunisers among participating caregivers had poor knowledge and misconceptions on transmission of infectious diseases.

Majority (81%) of participants in this study believe that immunisation is the best intervention to prevent all vaccine preventable diseases. The exception is only 19% of participants who regard measles as a natural disease and believe that it will disappear naturally without any medical intervention to prevent it. These findings confirmed a study conducted in Nepal that indicates 78.9% of caregivers believed that immunisation prevent the child from contracting VPDs (Matsuda 2002: 29). In addition, other participants did not regard TB and diarrhoea as diseases that can be prevented by vaccines but perceive them to be among those that require treatment if they occur.

Hence, Plumridge, Goodyear-Smith and Ross (2008: 15) argue that health workers should prioritise their best practices by empowering communities who most of the times treat them as "experts" in medical matters. Moreover, community empowerment will facilitate individuals in the formulation of values and fulfilment of health responsibilities. This implies that individuals possessing knowledge would be able to rationalise the cause and effect of the processes in a particular phenomenon. These responsibilities are outline in the South African Patient Rights Charter.

In summary, common dominating constructs of the Health Belief Model (HBM) were perceived susceptibility and self-efficacy for theme 1. External cues such as information written on the child's Road to Health Booklet/Card (RTHB/C) did not prompt participating caregivers' curiosity on reading or enquiring about it in order to possess satisfactory knowledge with regard to VPDs and their vaccines. On the other hand, participants perceived the risks of children being infected with VPDs but due to poor information (external cues); some caregivers failed to get their children to be fully vaccinated.

5.2.2 Participants' views of seeking health care

Perceived severity construct of the HBM tend to dominate participating caregivers' beliefs on effects of vaccine-preventable diseases in this theme. This construct is the belief about the seriousness or severity of a disease. This also comes from beliefs a person has about the difficulties a disease would create or the effects it would have on his/her life. Despite insufficient information on which vaccines children are eligible to get, participating caregivers reported children to be at risk of VPDs. These caregivers decided on visiting immunisation clinic for children to be vaccinated although some did not complete the schedule. The HBM suggests that people's perceptions or beliefs explain engagement or lack of engagement in health promoting behaviour. Influencing behaviour of caregivers therefore play a vital role in the uptake of immunisation by children under their care. In addition, positive opinions about effects of vaccines in protecting VPDs prompted some participating caregivers to complete immunisation schedule.

According to Bond and Nolan (1998: 442 - 443), both complete and incomplete immunisers recognised that immunisation protect others in the community and that if immunisation uptake was low, the risk of contracting these diseases would increase. This study reveals that strong opinions about the threat of the diseases do not significantly influence the desired health outcome (complete immunisation). Hence, incomplete and partial immunisers also held strong perceptions about the severity of the diseases. On the other hand findings from another study reveal only 1% of the focus groups holding positive opinion about immunisation stated absence of immunisation will lead to very high mortality in children (Etokidem & Wondifon 2013: 3).

In interpreting three constructs of the HBM in this theme, some participating caregivers believed that immunisation protect children against VPDs (perceived benefit) but were not capable of keeping with immunisation appointments (perceived barrier) due to personal/family commitments. On the other hand, some participants strived to visit the immunisation clinic to get new appointments (self-efficacy) because they believe vaccines will protect their children from VPDs (perceived benefit). Efficacy expectation is defined "as the conviction that one can successfully execute the behaviour required to produce the outcomes" (Rosenstock, Strecher & Becker 1988: 178).

Therefore, health interventions should aim to boost self-efficacy of caregivers by providing awareness on the benefits of immunisation and the dangers of vaccine-preventable diseases due to incomplete immunisation or non-immunisation of their children. High self-efficacy levels will influence compliance on keeping with immunisation appointments.

5.2.3 Perceptions on access to immunisation services

This theme focuses on perceptions that promote or inhibit caregivers to visit immunisation services. The researcher explored participants' emotions such as feelings and views in order to identify factors that affect immunisation services. Findings reveal two set of caregivers; those whose initial fears were allayed by health workers' positive attitudes and those who remain uncomfortable when visiting immunisation clinic. Nevertheless, majority of complete immunisers verbalised anxiety and fear on their initial visit to immunisation clinic followed by 'happy' feelings with subsequent visits. On contrary there were no significant differences among partial and incomplete immunisers in verbalising 'happy' or opposite feelings with subsequent visits. Feelings associated with bringing children to be vaccinated were cut crossing all six constructs of the HBM among participating caregivers.

In addition, findings reveal that the modifying factors such as demographic characteristics discussed in chapter 4 did not have significant influence on completion of immunisation schedule. The findings in this study corroborate that in Bofarraj (2011: 30 - 32) that reveal no significant difference of demographic characteristics were found to influence immunisation uptake. Contrary several studies reveal demographic characteristics to be predictors in completeness of immunisation schedule (CDC 2009: 103; Kapoor & Vyas: 2010: 12 - 15; Matsuda 2002: 24; Topuzoğlu et al 2007: 351).

Moreover, the attitudes of the health care workers towards the caregivers are very important for making use of the immunisation services. Plumridge, Goodyear-Smith and Ross (2008: 15) see the interaction between health worker and caregiver as utmost importance during delivery of immunisation services. The authors further argue that once caregivers find offence during this interaction, they may not complete a course of immunisations and may influence others not to immunise. The participating caregivers stated that they were reproved severely in instances when they missed immunisation sessions or lost clinic cards (RTHB) including when they had asked questions. The reported health workers' negative and judging attitudes caused the caregivers to feel uncomfortable for seeking health care when they delayed immunisation session. Therefore, they opted not to get the services when they had missed one session.

However, in this study, there was no significant difference on completing immunisation schedule by participating caregivers despite health workers' positive or negative attitudes during immunisation session since majority were complete immunisers. On the other hand, several studies found attitudes of caregivers towards immunisation services affecting immunisation uptake. According to Bofarraj (2011: 31) positive attitude of caregivers indicates to be significantly highly associated with better immunisation status where 86.33% were complete immunisers than 58.97% with negative attitudes. The author further reveals those who held negative attitudes were 13.66% from complete immunisers and 41.02% from partial immunisers.

To isolate factors that might affect both positive and negative immunisation behaviour, this study attempted to understand the process involved as well as identifying strategies to change the negative perceptions in order to optimise utilisation of immunisation services. Participants mentioned conditions contributing to barriers in accessing immunisation services. These conditions included poor knowledge on VPDs, physical and emotional health status of the caregiver, economical constraints and health system factors. In terms of the barriers to the uptake of immunisation services, findings reveal the health system factors as a major barrier towards seeking immunisation services in this study. The participants equated attending immunisation services with perceptions of 'invading health workers' spaces'.

Some caregivers mentioned that negative health workers' attitudes discourage them. Participating caregivers reported an alternative use of private health practitioners for immunisation services. However, due to high cost implications in visiting private health practitioners, caregivers opted to stay away and not to bring their children for immunisation. Hence, the researcher sees behaviour to have prompted the outbreaks of vaccine-preventable diseases (measles) in the district. These barriers to immunisation services can be overcome by promoting access to healthcare services. The researcher reviewed various literature studies that reveal perceived barriers of caregivers' perceptions that eventually affect immunisation coverage.

Savedoff (2009: 8) argue that by defining “access as the probability that an individual with a particular condition will receive an effective treatment for that condition does not address an individual’s perception of their access to health care”. Whereas, Xu, Saksena and Evans (2010: 1) describe supply and demand factors that are related to financial affordability, physical factors, social exclusion, marginalisation and cultural factors to govern people’s perceptions in accessing healthcare services. The authors’ argument is evident by one foreign participating caregiver from complete immunisers who reported hesitance on visiting immunisation clinic because of fearing xenophobic attack, but due to her HIV status later opted to get the child immunised.

In this theme, findings reveal perceived barriers to dominate perceptions of caregivers with regard to vaccine- preventable diseases and accessing immunisation services. In some other instances, immunisation could not be a priority due to the economical problems within the family because caregivers have to find income for living (work). Moreover, clinic operational times were not in favour for such caregivers.

5.2.4 Participants’ opinions on solutions to improve immunisation services

Regarding suggestions to improve the uptake of immunisation services, participants gave their views in relation to the strategies that should be implemented to boost the immunisation coverage. Their recommended measures included increased resources allocation, increased awareness campaigns, and making immunisation services more accessible. However, perceived barriers tend to influence low uptake of immunisation services.

Perceived barriers about health system factors reported involved attitudes of health workers, infrastructure challenges - inadequate waiting areas for caregivers, human resource shortages - prolong waiting periods, operational system; as well as community factors that involve lack of health information and education, barriers to access health services, personality traits-laziness, ignorance, selfishness, and lack of accountability. Participants were keen in maintaining relationship between communities and health professionals. They proposed healthy interactions through mutual understanding to reduce dropout rates in immunisation services. Participants commonly mentioned continuous education and establishment of proper reminder system to increase demand of immunisation services.

In line with the participants' suggestions on reminder system, the National Department of Health has launched MomConnect during 2014 as an initiative to use cell phone SMS technology by registering every pregnant woman in South Africa. Once registered the system send each mother pregnancy stage-based messages to support both mother and baby during the course of her pregnancy, childbirth and up to the child's first birthday. This initiative aims to strengthen demand and accountability of maternal and child services in order to improve access, coverage and quality of care for mothers and their children in the community. MomConnect system has incorporated immunisation messages to remind mothers about return dates.

5.3. LIMITATIONS TO THE STUDY

The key limitations to the present study include that it relies only on data collected from caregivers at one community health centre in the City of Tshwane, one district in Gauteng province. Therefore the results cannot be generalised as there are other seven community health centres and 68 public clinics rendering immunisation services in the district. Only caregivers of children who were considered the target group for routine immunisation services participated in the study. Some of the caregivers refused to participate in the study due to exhaustion caused by long waiting periods already raised as one of the barrier in the health facility.

Since this is a qualitative study, characterised by non-probability sampling and most likely a small sample size, the results of the study may not be generalised with certainty to a larger population. As such, the findings may not be a true reflection to identify contributing factors for missed opportunities or vaccine preventable disease outbreaks in the country. It is acknowledged that the major disadvantage of non-probability sampling is that it does not contribute to generalisation, that the extent of the sampling error cannot be estimated and that bias may be present (Brink 2005: 132).

However, the study helped to obtain an in-depth understanding of the factors influencing the use of immunisation services by the caregivers of children from birth up to 12 years of age. The data was collected and analysed until no new themes or perspectives emerged and when redundancy was achieved (Polit & Beck 2008: 351). The data collected during the face-to-face interviews was supported by field notes, which were used as part of the data analysis. The purposive sampling technique of the site helped to select participants who were able to provide valuable information about the factors influencing the utilisation of immunisation services (Mack, Woodsong, Macqueen, Guest and Namey 2005: 5). The theoretical significance of the study, its applicability to public health practice and its influence on future research activities therefore remain unquestionable.

5.4. RECOMMENDATIONS

This section makes suggestions based on the findings and provides recommendations that are made on the Department of Health and further research:

5.4.1. Suggestions for Department of Health

The findings of this study raise a number of important issues for practice. The observation of the current situation suggests that the cost incurred by managing vaccines preventable diseases and outbreaks can be cut down dramatically once the reasons for caregivers to immunise or do not immunise children is identified. Therefore the health system can help caregivers to overcome the obstacles to immunisation.

There is an urgent need for public education and mass media programmes in order to address the problems related to knowledge, the role of vaccines in reducing high morbidity and mortality rates against VPDs and access to immunisation services. Such programmes can include community based interventions led by community members including drama groups, community workshops, media and marketing projects, road shows, marches, games, poetry slams and community outreach. Priority VPDs should target those with higher burden of diseases and mortalities in the country such as measles, diarrhoea, pneumonia and TB however, not neglecting others especially those causing most common types of invasive diseases such as poliomyelitis, hepatitis B, meningitis, Haemophilus influenzae B, and others.

There is an urgent need for immunisation services to be made more accessible in order to boost their uptake. The present study reveals that caregivers were dissuaded from utilising immunisation services because of the health system factors such as attitudes of health workers, infrastructure and operational factors. Evidence from the present study suggests poor interaction between health workers and the caregivers requiring urgent attention. There is also an urgent need for increased allocation of human and infrastructural resources in order to improve the uptake of immunisation services by caregivers. In addition, there is a need for establishment of Social Mobilisation and Advocacy human resource post in the district to support public awareness and education activities.

5.4.2. Suggestions for further research

Since this study was limited only to caregivers attending child health services in one selected community health centre, the results cannot be generalised to all South Africans. It is therefore recommended that future studies may be done in other provinces of South Africa on the following topics:

- Perceptions of caregivers with regard to vaccine-preventable diseases
- Caregivers and health workers interactions during immunisation of children
- Knowledge, beliefs and attitudes of health workers with regard to vaccine-preventable diseases

Key message from the current study reveal a need for more studies to ascertain why immunisation dropout rate is still high and evaluate the effectiveness of current strategies and programmes for increasing immunisation coverage within communities. The researcher further recommends that a quantitative study involving large sample be conducted in order to generalise the findings of the study to other settings. One major limitation to the present study is that a small sample of caregivers was used for this study, hence the findings of this study cannot be generalised to other settings. In addition, the researcher recommends that a household community analysis study on perceptions of caregivers with regard to vaccine-preventable diseases to improve the utilisation of immunisation services be conducted.

5.5. CONCLUDING REMARKS

A number of important themes that emerged from this study helped the researcher to better understand why some caregivers hesitate to immunise, why some fail to complete immunisations and why some decide against immunisation. Importantly, those who complete immunisations, those who default and those who do not immunise share many perceptions of vaccines and diseases. This study has shown that the decision to immunise children can be explained to some extent by the constructs of the Health Belief Model. However, caregivers' interpretations of these concepts in this study showed to be complex. Nonetheless, perceptions of severity, susceptibility and cue to actions were important constructs found in this study, but not all vaccine-preventable diseases were considered serious.

It is noteworthy that many caregivers in this study have positive perceptions towards improving immunisation services, but unacceptable attitudes of health workers reported causes psychological discomfort in the communities to utilise immunisation services at an optimum level. The attitudes of health staff reported by participating caregivers created barriers in utilising immunisation services at optimum level. Moreover, non-compliance with routine vaccinations remains an unsolved problem among communities since South Africa is continuously reporting outbreaks of vaccine-preventable diseases e.g. measles, diphtheria etc.

Findings in this study reveal the perceived barriers of HBM explained in terms of values and health workers' attitudes being a significant construct contributing to increased missed immunisation opportunities in the City of Tshwane. Hence, the significance of this study assisted to enhance knowledge of health care workers with regard to acceptable legal practices, human rights and good public health practices. Moreover, the current study acknowledged social/environmental barriers that may improve educational efforts to increase the delivery of childhood immunisation. Nonetheless, the study has provided insight and a better understanding of the factors that influence caregivers to immunise or not immunise their children. The study findings have helped to make recommendations to support caregivers in the usage of immunisations.

The Expanded Programme on Immunisation in South Africa (EPI-SA) remains committed to its goal of national access to all relevant vaccines for all at risk. The EPI-SA slogan states “make everyday an immunisation day; if a child is well enough to be sent home, the child is well enough to go home immunised”. In fulfilling its strategic and legislative imperatives, South Africa undertook major reform in developing national core standards that respond towards quality of health care (see section 1.2.3). One of the six critical areas of core standards regarded as non-negotiable priorities focuses on values and attitude of health staff (South Africa 2011: 12). This priority area assesses monitors and evaluates patient’s perception and experiences towards health care they received to improve utilisation of services. Achieving compliance with these standards will assist the country proactively to put the systems in place that will avoid the most important risks to poor quality care and contribute towards improvement in immunisation uptake rate.

In conclusion the researcher recommends the strong need for each health manager’s annual performance contract in the City of Tshwane to include regulated national core standards as part of their key performance areas. This will ensures compliance with the set standards that will benefit the immunisation programme to achieve its goal in preventing, controlling, eliminating and eradicating vaccine-preventable diseases.