INTERVENTION STRATEGY TO IMPROVE PMTCT PROGRAMME IMPLEMENTATION FOR HIV-EXPOSED CHILDREN IN A RURAL SUB-DISTRICT IN NORTH WEST PROVINCE

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LIST OF ABBREVIATIONS

AIDS	Acquired immune deficiency syndrome
ANC	Antenatal clinic
ART	Antiretroviral therapy
ARV	Antiretroviral
AZT	Azidothymidine known as Zidovudine
3TC	Lamivudine
CAMH	Children and adolescent mental health
CHC	Community Health Centre
CINAHL	Cumulative index to nursing and allied health
CHW	Community health workers
DoH	Department of health
DRC	Democratic Republic of Congo
EID	Early infant diagnosis
EMTCT	Elimination of mother-to-child transmission
EBF	Exclusive breastfeeding
HAART	Highly active antiretroviral therapy
HIV	Human immunodeficiency virus
HTC	HIV testing and counselling
IR:D&D	Intervention research design & development
LTFU	Loss to follow-up
MSG	Mother support group
MTCT	Mother-to-child transmission
NIMART	Nurse initiated management of antiretroviral therapy
NMM	Ngaka Modiri Molema

NVP	Nevirapine
NW	North West
PCR	Polymerase chain reaction
PICO	Population, intervention, comparison, outcome
PHC	Primary health care
POC	Point-of-care
PMTCT	Prevention of mother-to-child transmission
PrEP	Pre-exposure prophylaxis
PRISMA	Preferred reporting items for systematic reviews and meta-analysis
QARI	Qualitative assessment and Review instrument
SA	South Africa
SSA	Sub-Saharan Africa country
SDG	Sustainable development goal
SMS	Short message service
STI	Sexual transmitted infection
UCT	University of Cape Town
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNICEF	United Nations International Children's Emergency Fund
UWC	University of the Western Cape
VHW	Village health workers
VMMC	Voluntary medical male circumcision
WHO	World health organization

KEYWORDS

HIV/AIDS

HIV-exposed children

Intervention strategy

Prevention of mother-to-child transmission

Strategy implementation

Rural areas

DECLARATION

I declare that "*Intervention strategy to improve PMTCT programme implementation for HIV-exposed children in a rural sub-district in North West province, South Africa*" is my own work, that it has not been submitted before for any other degree or examination in other university, and that all the sources I have used or quoted have been indicated or acknowledged by complete references.

Name: Sibusiso Buthelezi

Date: November 2022

Signed……

DEDICATION

I would like to dedicate this PhD dissertation to:

Dr Margaret Masilo who played a pivotal role by assisting me to conduct interviews in a participant's mother tongue language. Sadly, she didn't get to live to see the completion of this research project.

All my family members, and friends who lost their life from HIV related illnesses.

All children who are affected and infected by HIV in any way.

All the professional nurses and parents of children exposed to HIV.

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My gratitude to the institutions namely, the University of the Western Cape and Provincial Department of Health in the North West Province as well as the healthcare facilities in Mahikeng district that provided the ethical clearance and permission to conduct the study. I would like to thank all the participants who volunteered to take part in the study and the staff members that facilitated the arrangements for this study to put the study plans into action, without their assistance this study would not have been completed.

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ABSTRACT

Despite the remarkable general decrease of mother-to-child transmission in the global HIV response, a high number, 84%, of child HIV infections are occurring in Sub-Saharan Africa, particularly in rural areas. Mother-to-child transmission in rural areas persists owing to several factors including inadequate implementation of prevention of mother-to-child transmission programmes. In order to achieve a target of zero new HIV infection in children born from women living with HIV, the involvement of professional nurses and mothers of children exposed to HIV in developing new intervention strategies that would improve the implementation of the prevention of mother-to-child transmission programme is undeniable.

Thus, the purpose of this study was to design an intervention strategy to improve PMTCT programme implementation for HIV-exposed children in a rural sub-district in North West province after exploring the characteristics of different intervention strategies, professional nurses' perceptions and their attitudes toward the PMTCT programme implementation, mothers' perceptions on childcare received at the healthcare facility, as well as their role in preventing the spread of HIV to their children.

Applying the intervention research: design and development approach, the study was conducted in two phases, phase one and phase two. Phase one, data collection was carried out by conducting an integrative literature review and qualitative exploratory, descriptive research. Semi-structured individual interviews were conducted, and data were analysed qualitatively following Colaizzi`s (1978) seven steps of data analysis method as shown in chapter three in this study.

Findings from phase one of the study yielded 11 main themes, namely: component of the intervention, people that implement or are involved in the intervention, challenges in the implementation process of the intervention and outcome of the intervention (identified from objective 1); Professional nurses' knowledge, lack of human and consumable resources and challenges in the implementation of the prevention of mother-to-child transmission (identified from objective 2); health benefits from visiting the healthcare facility, professional nurses attitude, healthcare administrative system matters and significance of the role of a mother in the prevention of mother-to-child transmission (identified from objective 3 and 4).

Forty (40) conclusion statements were made based on identified issues from the integrative review and by professional nurses and the mothers of children exposed to HIV. The conclusion from the study findings is that there is a need to improve the implementation of the prevention of mother-to-child transmission programmes in rural areas. The identified conclusion statements formed the basis for the formulation of an intervention strategy process in phase two, which was objective five, the main objective of the study. The intervention process included the formulation of a vision, mission, values, principles, strategy objectives, and functional tactics to solve identified problems. The intervention strategy to improve the prevention of mother-to-child transmission programme implementation for HIV-exposed children in a rural sub-district in North West province was designed.

CHAPTER ONE

PHASE ONE AND OVERVIEW OF THE STUDY

1.1 INTRODUCTION

The Mother-To-Child Transmission (MTCT) of HIV remains a global public health concern (Jackson, Dihn, Lombard, Sherman & Goga, 2019). It has been more than 15 years since South Africa embarked on the fight against MTCT and great progress has been made to protect children from contracting HIV from their mothers through the Prevention of Mother-To-Child Transmission (PMTCT) programme (Wessels, Sherman, Bamford, Makua, Ntloana, Nuttall & Feucht, 2020). The PMTCT programme (Moyo, Mazanderani, Kufa & Sherman, 2020) has yielded noticeable results since its inception; however, to achieve the Elimination of Mother-To-Child Transmission (EMTCT), there must be a deliberate action to improve PMTCT programme implementation for HIV-exposed children, particularly in the rural areas.

In this chapter, the researcher gives an overview of what this study entails and a summary of how the two methodological phases evolved. The two phases of the study comprise phase one; an information-seeking phase and phase two; an intervention strategy development phase. The chapter presents the following sections; study background and rationale, problem statement, aim and objectives, operational definition, the significance of the study, theoretical framework, summary of the research methodology and the research philosophical assumptions. To conclude the chapter, a layout of the thesis is presented.

1.2 BACKGROUND AND RATIONALE FOR THE STUDY

Remarkable progress has been recorded globally in reducing new Human Immunodeficiency Virus (HIV) infections in children exposed to HIV and consequently a decrease in the child mortality rate. New HIV infections among children have declined by 54%, from 2010 to 2020 (United Nations Programme on HIV/AIDS [UNAIDS], 2020). The child mortality rate has been reduced significantly from 76 to 39 deaths per 1000 live births, from 2000 to 2018, globally (UNAIDS, 2019). These trends have also been observed in Sub-Saharan African (SSA) countries where the mortality rate in children due to the acquired immunodeficiency syndrome (AIDS) related deaths has been known to be high. A noticeable reduction from 153

to 78 deaths per 1000 live births from 2000 to 2018 has been recorded (United Nations Children`s Fund [UNICEF], 2019). However, the world's countries are still in the race to fight MTCT. Notwithstanding this, the progress in reducing MTCT and the child mortality rate among children has not been fast enough, particularly in SSA countries (UNICEF, 2019).

South Africa (SA) is one of the SSA countries that remains severely affected by the HIV epidemic (UNAIDS, 2019). However, according to the district health barometer, SA has made considerable progress in reducing MTCT from 1.3% in 2016/17 to 0.7% in 2018/19 (Massyn, Barron, Day, Ndlovu & Padarath, 2020). The reported decline is attributed to the PMTCT programme which was implemented in the early 2000s (Tait, Peters, McIntyre, Mnyani, Chersich, Gray & Violari, 2020), and the multiple strategies implemented to reduce MTCT such as "annual review on implementation policies, accurate data recording and expanding treatment initiation to all primary health care (PHC) nurses" (Massyn et al., 2020).

Since then, in SA, the PMTCT programme has been the leading intervention utilised to curb the new HIV infections and child mortality caused by AIDS-related illnesses among children. This means that the programme had to be up-scaled continuously to strengthen its effectiveness in keeping pregnant women healthy and HIV-exposed children safe from contracting HIV from their mothers. Hence, PMTCT Options A and B antiretroviral protocols have evolved over the years to a current protocol known as PMTCT Option B+. The changes in these protocols evolved as follows;

1) **Option A** commenced in 2002 following the pilot that was conducted in 18-sites across all provinces of South Africa. Option A, comprised of giving zidovudine (AZT) to the mother as early as 14 weeks of gestation and continued during pregnancy; single-dose nevirapine (Sd-NVP); maternal AZT and lamivudine (3TC) were continued with the mother during the first week post-partum, and NVP daily to the infant throughout the breastfeeding period;

2) **Option B** was adopted in South Africa in 2013. It consisted of a triple antiretroviral (ARV) drug, basically consisting of the recommended first-line ART for pregnant women (who require it for their own health) until delivery and through to the end of breast feeding for the women with a CD4 cell count $\geq$ 350cells/mm^3. The HIV Polymerase Chain Reaction (PCR) testing for HIV-exposed children was performed at 6 weeks period, post-breastfeeding period and at 18 months post-delivery period.

3) **Option B+,** an option that was extended by WHO was implemented in South Africa in 2015. It consists of a triple ARV regimen initiated for all pregnant and lactating women living with HIV regardless of the CD4 cell count, for their health and to prevent vertical HIV transmission. The HIV PCR testing for HIV-exposed children is done at birth, prophylactic nevirapine, AZT and Cotrimoxazole are provided after birth then followed by a repeat at 10 weeks and HIV test at 6 weeks post cessation of breast feeding and 18 months rapid test for HIV-exposed children, and (Goga, et al., 2018). At the time of this study, the PMTCT Option B+ was the latest ARV regimen approach used in SA.

The primary aim of the PMTCT programme was to prevent the transmission of HIV from mothers living with HIV to their children from the pregnancy stage up to the breastfeeding period and further decrease HIV/AIDS-related child mortality (Pellowski, et al., 2019). Therefore, the evolution of the PMTCT programme remains a great key to achieving its primary aim; hence it must be guided by scientific evidence in order to ensure that it remains relevant, practical, and effective. It is, therefore, not surprising that the PMTCT evolution has resulted in a national noticeable decline in MTCT from 23% in 2003 to 0.7% in 2019 (Wessels, et al., 2020).

Despite this general MTCT decline recorded in the country, the same cannot be said for the rural districts which have not shown the speed in improvement as compared to the national norm. Therefore, the critical systemic gaps that exist in the PMTCT programme such as; missed HIV testing opportunities due to stock-outs, delayed HIV PCR test results return, late ART initiation in children and lack of HIV retesting post-breastfeeding as well as individual challenges such as mixed feeding because of cultural beliefs and practices, and defaulting from treatment particularly in breastfeeding mothers, result to new HIV infections through MTCT (Mlambo & Peltzer, 2020; Gill et al., 2020; Dirisu, Eluwa, Adams, Torpey, Shittu & Adebajo, 2020; Rwema, et al., 2019; Pellowski, et al., 2019).

In South Africa, it is undeniable that there is a vast difference between rural and urban areas, especially concerning healthcare services. In rural areas, there is a lack of highly skilled professional nurses, and healthcare facilities are still very far from where people live, if not inaccessible at all due to lack of transport, costs to reach them, underdeveloped roads, and culture-related influences, to mentioned a few (Warri & George, 2020; Mlambo, Phaswana-

Mafuya, Peltzer & Penn, 2018; Kaswa, Rupesinghe & Longo-Mbenza, 2018). Yet in the urban areas, the situation is the total opposite of what women living with HIV and their children are faced with in rural areas. Hence, there is a need for more studies to be directed to rural areas to strengthen health programmes and in this case, particularly the PMTCT programme to ensure that children in the rural areas fully benefit from the programme (Dirisu, et al., 2020; Fords, Crowley & Van der Merwe, 2017).

The sustainable development goals (SDGs) particularly Goal 3, which is to "ensure healthy lives and promote well-being for all at all ages", should be a driving force in making sure that rural sub-districts are not left behind if a vision of zero mother-to-child HIV transmission is to be realised by 2030 (Vrazo, Sullivan & Phelps, 2018). Focusing on rural areas is more urgent than ever before because it has been found that higher MTCT rates are mostly in rural regions (Jones, Rodriguez, Mandell, Lee, Weiss & Peltzer, 2018). For instance, some of the districts that report high HIV PCR test positive at 10 weeks in rural provinces are Amathole Eastern Cape Province (2.3%) and Ngaka Modiri Molema (1.0%) compared to the urban regions such as Cape town (0.2%) in the Western Cape. In the sub-district (Ngaka Modiri Molema) in North West Province where this study was conducted, there has not been any progress in the reduction of MTCT of HIV from 2017 (1.0%) to 2019 (1.0%). Even at the provincial level, the rural province is still higher (North West 0.9%) than the national average which is 0.7% compared to the urban province (Western Cape 0.3%) (Massyn et al., 2020).

The North West (NW) province is one of the five provinces where more than half of the population lives in rural areas. According to the district health barometers, 2018/19, NW province's child mortality rate was estimated at 6.2% higher than the national average of 4.7%. Although the district health barometers report did not stratify infant mortality according to the cause of death, it, however, indicated that HIV infection is still the major contributor to child mortality with opportunistic infections such as pneumonia, respiratory tract infections and diarrhoea reported as a cause of death (Massyn et al., 2020). This pattern is confirmed by Tlou, Sartorius and Tanser (2018) who highlight that the leading causes of death in children in SA are HIV, lower respiratory tract infections, diarrhoea, and low weight at birth. Hence, the implementation of the PMTCT in rural areas must be strengthened in order to curb new HIV infections and reduce child mortality from preventable diseases and ultimately achieve EMTCT which remains a challenge in the paediatric health fraternity (Pellowski et al., 2019).

Challenges regarding the proper implementation of the PMTCT programme are still rampant in rural areas (Mlambo & Peltzer, 2020; Yah & Tambo, 2019). These are experienced both at systematic and individual levels. Systematic challenges include the shortages of professional nurses, lack of highly trained skilled professional nurses, shortage of HIV test kits and ARVs, and poor tracking of patients who are 'lost to follow-up' without completing the PMTCT programme. In addition, insufficient consultation rooms, professional nurses' attitudes, long waiting times, and lack of information on the PMTCT are commonly reported (Habedi, 2020; Kilowua & Otieno, 2019). The rural environment such as distance to the nearest health facility and poor road infrastructure also have a significant impact on access to the PMTCT programme.

On the other hand, the individual challenges are often driven by fear of the disease, culture and the socio-economic factors associated with women in these areas. The mothers' refusal to test themselves or their children for HIV infection is one of the depictions of fear of the disease (Habedi, 2020; Yah & Tambo, 2019). This is exacerbated by stigma and discrimination associated with a positive HIV status from their families and partners where the woman is often blamed. Entrenched traditions lend women in rural areas to positions that force them to choose between recommended health practices and cultural practices. These include choices such as mix-feeding the child to observe the conventional cultural practices (Phakisi & Mathibe-Neke, 2019) and home birth which indicate non-adherence to PMTCT protocol among others. Patriarchal beliefs such as the lack of males' involvement in maternal care and infant rearing also hinder the rural women's right of choice and spousal support, consequently, access to health (Mabunda, Sigovana, Chitha, Apalata & Nomatshila, 2021; Dirisu, et al., 2020).

The poor socio-economic status of women in rural areas is another factor that plays a role in the health of rural women and their HIV-exposed children. This often subjects them and their HIV-exposed children to under nutrition and failure to adhere to scheduled appointments at clinics due to a lack of money for transport (Mangena-Netshikweta, Maluleke, Tshililo & Nemathaga, 2019; Fekele & Wasie, 2018). Illiteracy, which influences decision making and lack of information on PMTCT, are critical challenges facing women in the rural areas that ultimately impact PMTCT programme utilisation (Favour Ntoimo, Okonofua, Adejumo, Imongan, Ogu & Anjorin, 2019). Therefore, to achieve the goal of EMTCT and subsequently meet the SDGs targets of reducing the mortality rate in children to as low as 25 deaths per 1000

live births and end preventable deaths in children by 2030 (UNAIDS, 2021). Intervention strategies to close the critical existing gaps should be developed to improve the implementation of the PMTCT programme, particularly in rural areas, especially during a post-partum period when the child is known and can be traced.

Implementation of the PMTCT programme has been found to be inadequate in many instances with a resultant impact on the health and lives of children (Mgabo, Msuya & Mushi, 2020; Jones, et al., 2019; Schmitz, et al., 2019; Kweyamba, Buregyeya, Kusiima, Kweyamba & Mukose, 2018). Health policy implementation have been a challenge not only in South Africa where the gap between policy development and implementation has been reported (Nxumalo, Goudge, Gilson & Eyles, 2018; Chopra, Daviaud, Pattison, Fonn & Lawn, 2009). In a study conducted by Dasgupta et al. (2016) in Malawi on HIV policy and implementation, it was found that policies were inadequately implemented at some healthcare facilities. For instance, HIV testing and counselling is a national policy, but only a few healthcare facilities offered HIV testing and counselling consistently according to a national policy protocol and other healthcare facilities were giving patients two months' drug supply of ART instead of three months as per national policy protocol (Dasgupta et al., 2016).

The PMTCT programme is meant to protect the baby from contracting HIV from the mother who is living with HIV, guide professional nurses to make appropriate decisions about treatment on specific health conditions following set HIV/AIDS management protocols and promote good health for both the mothers and their HIV-exposed children. Therefore, the relevant personnel ought to implement the PMTCT programme cautiously and accordingly. In South Africa, the role of implementers in the health sector is often spearheaded by nurses as they are the largest health cadres at the frontline of healthcare, particularly in rural areas (Mutabazi, et al., 2020; Pratiwi, 2020). The lack of involvement of professional nurses, consumers of care and other relevant stakeholders when developing intervention strategies has the potential to affect the smooth implementation of such programmes and strategies.

Additionally, caregivers are the recipients of care as a proxy for the children under their care. Therefore, their voices as end users should be audible during the intervention strategy planning process and implementation. In a study conducted by Mokitimi, Schneider and de Vries et al. (2018) in South Africa on children and adolescent's mental health (CAMH) policy where the

authors sought to examine the history and current state of CAMH development and implementation, they found that the service users, in their case, parents and children, were not involved in the development and implementation process thus poor uptake of the service. Mwendera et al. (2019), in Malawi, conducted a review on the malaria policy which aims to reduce malaria as a public health concern and ultimately achieve eradication. The authors found that the views of the primary participants were not considered during the development process hence the communities were not accepting the ownership role of the intervention during the implementation process.

Therefore, the involvement of professional nurses and parents in the process when intervention strategies are developed is imperative; so that they do not feel that policies are imposed on them. The people within a context understand the setting better, therefore, can influence the success of the implementation process in a way that the outside actors cannot (Dryden-Palmer, Parshuram and Berta, 2020; Mathieson, Grande & Luker, 2019). Hence, this study explored and described the views of all actors and compared this to what is already reported in the literature in a quest to develop relevant strategies that are relevant for the rural context. It is, therefore, the view of the researcher that to achieve EMTCT and SDG three targets; a proper and efficient implementation of context-tailored strategies must be prioritised to speedily change the tides of HIV/AIDS in children in rural areas. Hence, this study aimed to develop an intervention strategy to improve PMTCT programme implementation for HIV-exposed children in a rural sub-district in the North West Province.

1.3 PROBLEM STATEMENT

Most HIV-exposed children get infected through MTCT during pregnancy, labour, delivery, and/or post-partum (breastfeeding) (Mlambo & Peltzer, 2020). In South Africa, the PMTCT programme has been in place since early 2002, and there has been multiple transitions (such as options A, B & B+) in the interventions to reduce MTCT. However, the transmission of HIV in children, particularly in rural areas, persists (Yah & Tambo, 2019). This is despite the significant progress at the national level in which a reduction from 1.3% in 2016/17 to 0.7% in 2018/19 was reported (Massyn et al., 2020). However, the rural areas still lag behind with HIV, highly contributing to child mortality (52/1000 live birth) than in the urban areas where child mortality rates are estimated at 20/1000 live births (Lake et al., 2019). The North West

Province, one of the provinces where much of its population lives in rural areas, the MTCT transmission was reported to be 0.9% which is still above the national average of 0.7%. In addition, there have been reversal gains in Ngaka Modiri Molema District where this study was conducted; the infant mortality rate has gone up from 4.7 in 2017 to 10.2 in 2019 (Massyn et al., 2020).

Inadequate implementation of Health policies and the programme has been cited as one of the contributors to poor health outcomes. However, it seems like there is a lack of intervention strategies that focus on ensuring proper implementation of programmes, in this case, the PMTCT programme. The scenario is assumed to be worse in rural areas (NW province which is the focus of this study) as more systemic and individual challenges are experienced. These include factors that include, but are not limited to, lack of adequately trained healthcare providers, stock-outs of ARTs, HIV test kits and the inability of the mothers to access the services (Luwanda et al., 2021; Dirisu et al., 2020;).

The nurses who are core to the implementation process in health facilities need to be invested in the development and implementation process. Their views must be heard when implementation strategies are developed as they have a better understanding of context-specific challenges in health facilities. However, it seems nurses, particularly those in rural areas, are often not involved which may lead to implementation resistance hence the need to explore their perceptions so as to inform the intended strategy development process.

Additionally, the importance of the contribution of parents (as users) in intervention strategy development cannot be ignored as they have insight into the factors that make them not comply with PMTCT protocol. This is demonstrated by the mothers' poor return to bringing their babies for follow-up appointments, failure to bring a child for retesting post-breastfeeding, and drop out of care prior to completing the PMTCT programme (Gill et al., 2020; Dirisu, et al., 2020; Rwema, et al., 2019).

Currently, the mothers' input seems to be lacking. This lack of recipients' involvement often leads to resistance and poor adherence to service interventions, in this case, the PMTCT protocols. Hence, there is a need to explore their perceptions in order to inform the development of relevant and acceptable strategies.

1.4 AIM

This study aimed to design an intervention strategy to improve PMTCT programme implementation for HIV-exposed children at a rural sub-district in the North West Province.

1.4.1 Objectives

1.4.1.1. To conduct an integrative literature review to explore the characteristics of different intervention strategies used to improve the implementation of health policies globally and particularly in the rural areas;

1.4.1.2. To explore the professional nurses' perceptions and attitudes on the PMTCT programme implementation pertaining to HIV-exposed children;

1.4.1.3. To explore the perceptions of parents (of children exposed to HIV) on childcare received in the rural sub-district health care facilities;

1.4.1.4. To explore the parents' perceptions of their role in the prevention of the spread of HIV infection to their children; and

1.4.1.5. To design an intervention strategy to improve PMTCT programme implementation for HIV-exposed children in the rural sub-district in North West Province.

1.5 OPERATIONAL DEFINITIONS

Parents: Parents are defined as a person who is an adoptive, a guardian or a biological parent (mother or father) to a child or children exposed to HIV.

Nurses: Nurses are defined as all persons trained and registered under the directives of the South African Nursing Council (SANC) in order to practice nursing or midwifery. In this study nurses refers to professional nurses and midwives that are providing health care services to children exposed to HIV and their mothers.

HIV and AIDS policies: HIV and AIDS policies is defined as policies pertaining to prevention, treatment and care of HIV and AIDS in South Africa as promulgated by the National Department of Health (NDoH) particularly located in the PMTCT programme.

Intervention strategy: Intervention strategy is defined as a systematic plan of action consciously adapted to improve the implementation of HIV and AIDS policies pertaining to paediatrics.

Children exposed to HIV: Children exposed to HIV referred to children who were exposed to HIV from their mothers who are living with HIV.

1.6 SIGNIFICANCE OF THE STUDY

It is envisaged that the results of this study could contribute to closing the gap that exists in the current policy implementation practices in the prevention of mother-to-child transmission of HIV; as well as the management of children that are exposed to HIV. This study could strongly inform policymakers with new perspectives that they need to consider when developing HIV policies for children exposed to HIV, especially in rural health care facilities. Moreover, the study could contribute to the economy of South Africa by bringing new strategies to improve PMTCT programme implementation which could prevent unnecessary spending of money caused by inadequate PMTCT programme implementation in the fraternity of HIV. This study will further contribute to nursing education by bringing new knowledge to HIV/AIDS policies. This will be channelled through the nursing curriculum.

1.7 THEORETICAL FRAMEWORK

A theoretical framework is perceived to be a structure that guides a research study and explains the progression of the phenomenon under investigation. Hence, it comprises concepts interconnected to explaining the relationships between them (Kivunja, 2018). The current study adopted the Health Policy Analysis Triangle by Buse, Mays and Walt (2005).

1.7.1 The health policy analysis triangle

The Health Policy Analysis Triangle as the theoretical framework was adopted to guide this study design and intervention strategy development process. The Health Policy Analysis Triangle is a simplified analytic model which is globally used for any policy, at any policy level, to understand better the process of health policy reform and to plan for implementation more effectively. The model comprises four interrelated elements namely, actors (Who),

context (Why), process (How) and content (What), which help to understand why policies do or do not succeed (Buse et al., 2005).

The framework states that for policy implementation to be a success, the inter-relationships between the four elements should not be neglected right from the beginning stage of policy development because it allows for better planning and effective implementation; hence, the focus of policies should not only be on the content as it frequently has been in the past, but it should take into consideration other elements, especially the actors (Buse et al., 2005). The Health Policy Analysis Triangle is a suitable framework to explore various factors that may affect health policy and implementation thereof. The four elements that comprise the Health Policy Analysis Triangle are depicted in Figure 1, below.

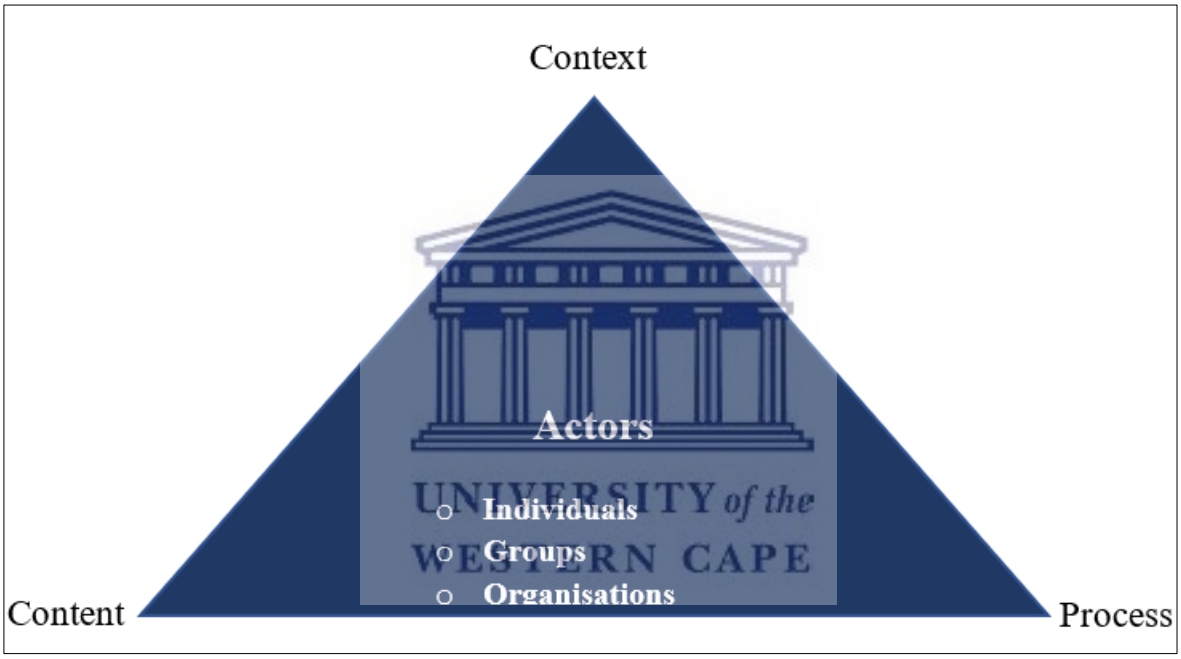

Figure 1-1: A model for health policy analysis triangle
Source: Walt and Gilson, 1994 (as cited in Buse et al., 2005)

The four elements of the Health Policy Analysis Triangle framework namely, actors, context, process, and content are explained as follows:

1). Actors: It refers to individuals or members of groups or organisations or stakeholders who participate in and influence the formulation and implementation of the policy;

2). Context: It deals with a particular area, location, or situation which could be affected by many factors such as political system, type of economy, situational factors, structural factors, cultural factors, international or exogenous factors;

3). Process: It refers to the process in which policies are initiated, formulated, negotiated, communicated, and implemented; and

4). Content: It refers to a substance of a particular policy which details its constituent parts (Buse et al., 2005).

The four elements of the Health Policy Triangle framework are applied in this study as follows;

- ***Actors*:** In this study, actors are professional nurses, midwives (who provide care and implement PMTCT programme in public healthcare facilities) and parents of children exposed to HIV.

- ***Context*:** In South Africa, there is an enormous difference between urban and rural areas, similarly the factors that affect policy implementation and health outcomes in these two areas are different. The context of this study was the healthcare facilities in the rural areas, Ngaka Modiri Molema, in the North West Province.

- ***Process*:** This element focuses on the health policy processes such as formulation and how it is brought forward and implemented. In this study, professional nurses, midwives and parents or caregivers' perceptions, attitudes, roles, challenges, and solutions were explored to gain a deeper understanding of the PMTCT programme (Option B+) implementation.

- ***Content*:** The PMTCT programme formed the contents of this study. The parents' or caregivers` understanding of the PMTCT programme and their role to prevent new HIV infections was explored.

The application of the Health Policy Analysis framework is depicted below, Table 1.1, which shows objectives 2,3 and 4.

Table 1-1: Application of the health policy analysis model to the study

OBJECTIVES	THEORETICAL CONSTRUCT	APPLICATION
1. To conduct an integrative review to explore the characteristics of different intervention strategies used to improve the implementation of health policies globally and particularly in rural areas.		
2. To explore the professional nurses' perceptions and attitudes on the PMTCT policy implementation pertaining to HIV-exposed children.	Actors applied process	The model assumption is that if the actors understand the policy processes and agree with them; actors are likely to implement the policy effectively. However, if actors feel that the policy is forced on them, they are unlikely to adhere to adequate policy implementation processes.
3. To explore the perceptions of parents (of children exposed to HIV) on childcare received in the rural sub-	Actors' context	The model assumption is that recipients of the policy understand the context better than the authorities. In this study, the healthcare facilities are in the rural context; therefore, the parents are in a far much better position to understand the complexities facing the rural context. Meaning

OBJECTIVES	THEORETICAL CONSTRUCT	APPLICATION
district health care facilities.		they will understand the cultural context and possible care delivery within the context in which cultural practices are alive. In addition, they will be able to point out nuances that are part of the cultural, rural context which could be a hindrance to care delivery.
4. To explore the parents' perceptions of their role in the prevention of the spread of HIV infection to their children.	Actors applied process	The model assumption is that if people have a clear understanding of their roles in policies and do not feel that a policy is forced on them, and the policy considers their needs, people are likely to implement the policy effectively. This is important because HIV-exposed children depend on their parents or caregivers to be brought to the healthcare facility for care.
5. To design an intervention strategy to improve PMTCT policy implementation for HIV-exposed children at the rural sub-district in the North West Province.		

According to the model utilised in this study, the health policy focus should go beyond the content aspect of the policy and add the actors (in this case nurses and parents), context and process as part of the focus. This is because these elements are very important when it comes to policy choice; whether a policy would be effective or ineffective and implemented. This is so because actors are influenced by the context within which they work and live, whereas the context is affected by instability or uncertainty created by a change that happens in that area.

In turn, the process is influenced by actors, their position in power, values, and expectations (Buse et al., 2005). Actors are at the centre of the health policy analysis triangle; this means that they have a powerful role to play when it comes to policy outcomes.

Since the aim of the current study was to design an intervention strategy to improve PMTCT programme implementation in rural areas, it was necessary to focus on the actors, as implementers (in this case professional nurses and parents), and mothers; their understanding of the PMTCT programme content (their role and responsibility as outlined in the programme), the process (how they view the current implementation process) and the context as the impeding factors to the proper and efficient implementation of PMTCT services which could be situational, structural socio-cultural factors. Thus, in this study, there was a need to firstly explore the perceptions of the professional nurses and parents in order to design a practical intervention strategy to improve PMTCT programme implementation in rural areas. This was necessary to avoid the implementation gaps because often time, policy decisions are made by authorities and they assume that policies would easily be translated into action by the implementers (Buse at al., 2005).

1.8 RESEARCH METHODOLOGY

1.8.1 Research design

A research design is described as a blueprint for conducting a study and it aims to provide overall control over factors that may influence the validity of the study (Burns & Grove, 2009). Hence, Green and Thorogood (2018) reiterate that a research design is a plan of specifying the selection of the participants, data collection and data analysis method to be used. In this study, an intervention research approach was utilised. Two information-gathering designs in the form of integrative literature review and qualitative exploratory and descriptive design were used in this study. Integrative literature review design was used to meet objective one; whereas qualitative exploratory and descriptive design was used to meet objectives two, three and four. A summary of the research process is presented in Table 1.2 below. A detailed description of the chosen designs is presented in Chapter 3.

1.9 RESEARCHER'S PHILOSOPHICAL ASSUMPTION

A research paradigm refers to a set of beliefs that constitute the researcher`s perceptions regarding the nature of social reality, nature of knowledge and ways of learning about social reality and how to find out about reality (De Vos, Strydom, Fouché` & Delport, 2011). Furthermore, a paradigm is defined as a way of looking at natural phenomena that encompasses a set of philosophical assumptions and that guides the researcher's approach to enquiry (Brink et al., 2012). In addition, Barker (2003) explains paradigm as a pattern containing a set of legitimated assumptions and designs for collecting and interpreting data.

In this study, the researcher arises from a constructivist philosophical assumptions' point of view which holds a belief that reality and knowledge cannot be discovered by researchers alone but are constructed through the process of interaction between the researcher and participants (De Vos et al., 2011). Thus, the knowledge acquired from the participants was valued and used by the researcher to co-construct new information which assisted in designing an intervention strategy to improve the implementation of the PMTCT programme. The researcher's philosophical worldview on ontology, epistemology and methodology as described below, is well aligned with the theoretical framework adopted to guide this study design and intervention strategy development process.

1.9.1 Ontology

Ontology refers to the nature of social reality and what is there to know about it (De Vos et al., 2011). Before anything else, the researcher holds a view that nurses and parents are human beings before their professional roles and or whatever other roles they occupy in their lives. Meaning, their thinking and behaviour are informed by a certain reality. Human beings do not view things in the same way, which dismisses the notion of a single reality or truth. Meaning, what is a reality or truth to one person may completely differ to the other person (De Vos et al., 2011).

In having different views, as a constructivist, the researcher believes that understanding the participants' different points of view, and the nature of their reality, from the people who experienced it personally, would help the researcher to design a practical, contextual tailored intervention strategy to improve implementation of the PMTCT programme.

1.9.2 Epistemology

Epistemology refers to a branch of philosophy that deals with the nature of knowledge and the assumptions and beliefs that people have about the nature of knowledge (Botma et al., 2010). Rising from the constructivist worldview, the researcher holds a view that nurses and mothers or caregivers can construct their knowledge based on their reality and experiences. It is imperative to tap into a person's reality and get to know "how things really are and how things work" (De Vos et al., 2011). Therefore, such knowledge could only be gathered in partnership with the participants. It is for this reason that the researcher chose to interact with the nurses and mothers or caregivers instead of letting them tick a form as a method of data collection.

In this context, the researcher does not separate himself from the participants during the study process but views the participants as project partners working together with the researcher in finding a solution to solve the problem which has been identified. Because it allowed the researcher to co-construct the knowledge of the participants through exploration and gaining a deep understanding of the participants' perceptions and challenges in the implementation of the PMTCT programme in rural areas. Without such an in-depth understanding, it would have been impossible to gather substantial knowledge from the participants to design an intervention strategy that is effective to solving the problem and be well endorsed by the actors and consequently be effectively implemented.

1.9.3 Methodology

Methodology refers to the procedural methods that a researcher must employ to acquire knowledge from the participants (Green & Thorogood, 2018). An integrative literature review was one of the methods that were used to collect non-empirical data in this study. The researcher also conducted face-to-face individual interviews and used a semi-structured tool to collect empirical data in phase one. This method of data collection was chosen because the researcher believes that the best method to find the truth and deeply understand the participants' nature of reality and knowledge is through interacting with each one of them by asking a predetermined question and following up with probing questions for clarity and in-depth information. A summary of the research process is presented in Table 1.2 below. A detailed description of the research methodology is presented in Chapter 3.

Table 1-2: Summary of the research process

OBJECTIVES	POPULATION, SAMPLE AND SAMPLING	DATA COLLECTION	DATA ANALYSIS	RIGOUR	DATA SYNTHESIS/ PRESENTATION
PHASE 1: INFORMATION SEEKING INTEGRATIVE LITERATURE REVIEW AND EMPIRICAL DATA					
OBJECTIVE 1: To conduct an integrative literature review to explore the characteristics of different interventions used to improve the implementation of health policies globally and particularly in rural areas.	PROBLEM IDENTIFICATION: Research question, and Implementation of the PICOS (Population, Intervention, Comparison, Outcome, Study design) strategy	LITERATURE SEARCH: Electronic data bases search, ancestry literature search, PRISMA 2009 flow diagram, Inclusion and exclusion criteria, and Search terms	DATA EVALUATION AND DATA ANALYSIS: Critical Appraisal Skills Programme (CASP) Critical appraisal instrument (Randomised control trials, quantitative and qualitative studies) **Manual content analysis**: Data reduction Data display Data comparison	METHODOLOGICAL RIGOUR: Whittemore and Knafl, 2005	PRESENTATION/ SYNTHESIS OF DATA Synthesis in a form of a conclusion statement to present the process of integration of the study's findings

OBJECTIVES	POPULATION, SAMPLE AND SAMPLING	DATA COLLECTION	DATA ANALYSIS	RIGOUR	DATA SYNTHESIS/ PRESENTATION
			Drawing conclusion and verification		
OBJECTIVE 2: To explore the professional nurses' perceptions and attitudes on the implementation of the PMTCT programme pertaining to HIV-exposed children.	**Population:** (n=39) All the professional nurses involved in providing the PMTCT services **Sample:** (n=12) **Sampling:** Purposive sampling	**Semi-structured interviews:** Face-to-face individual interviews	Thematic analysis by Colaizzi`s seven steps of data analysis	**Trustworthiness:** Member checking Thick descriptions Prolonged engagement Independent coder	
OBJECTIVE 3: To explore the perceptions of parents (of children exposed to HIV) on childcare received in the rural sub-district healthcare facilities.	**Population**: (n=73) All mothers of children exposed to HIV receiving PMTCT services **Sample**: (n=10)	**Semi-structured interviews:** Face-to-face individual interviews	Thematic analysis by Colaizzi`s seven steps of data analysis	**Trustworthiness:** Member checking Thick descriptions Prolonged engagement Independent coder	

OBJECTIVES	POPULATION, SAMPLE AND SAMPLING	DATA COLLECTION	DATA ANALYSIS	RIGOUR	DATA SYNTHESIS/ PRESENTATION
	Sampling: Purposive sampling				
OBJECTIVE 4: To explore the parents' perceptions of their role in the prevention of the spread of HIV infection to their children.	**Population**: (n=73) All mothers of children exposed to HIV receiving PMTCT services **Sample**: (n=10) **Sampling**: Purposive sampling	**Semi-structured interviews:** Face-to-face individual interviews	Thematic analysis by Colaizzi's seven steps of data analysis	**Trustworthiness:** Member checking Thick descriptions Prolonged engagement Independent coder	
PHASE 2: INTERVENTION STRATEGY DEVELOPMENT					
OBJECTIVE 5: To design an intervention strategy to improve implementation of the PMTCT programme for HIV-exposed children at the rural sub-district in the North West Province.					

1.10 OUTLINE OF THE THESIS

The chapter sequence of this thesis is outlined as follows:

Chapter 1: Overview of the study

Chapter 2: Literature review

Chapter 3: Research methodology

Chapter 4: Integrative literature review and discussion with literature control

Chapter 5: Empirical data results' presentation and discussion with literature control

Chapter 6: Intervention strategy development

Chapter 7: Summary, conclusions, limitations, and recommendations of the study

1.11 CHAPTER SUMMARY

This chapter presented the overview of the study which includes a detailed study background and rationale for conducting the study, problem statement, aim and objectives, operational definition, the significance of the study, theoretical framework, and research philosophical assumptions. The next chapter provides a comprehensive literature review conducted in this study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Chapter one outlined the background and rationale of the study, including the problem statement, aim and objectives. This chapter aims to present a comprehensive review of literature on HIV prevention strategies and perceptions of healthcare workers and mothers around the implementation of the PMTCT programme including its challenges, and the characteristics of different intervention strategies used in an attempt to improve implementation globally and particularly in the rural areas. The section of the literature review on characteristics of different intervention strategies is detailed in Chapter 4 of this study because an integrative review approach was followed to outline them.

2.2 THE HIV EPIDEMIC

The year 2022 marks 41 years since the first case of AIDS was reported (De Cock, Jaffe & Curran, 2021). Since then, the global community has done a remarkable job to save people's lives from being wiped out by the devastating epidemic. However, the efforts to fight HIV/AIDS intensified in the early 2000s when the declaration of commitment to HIV/AIDS and the decision to establish the Global Fund to Fight AIDS, Tuberculosis and Malaria was undertaken (Olufadewa, Adesina, Oladele, Oladoye & Eke, 2021; Steurs, Orbie, Delputte & Verschaeve, 2018; Atun, Pothapregada, Kwansah, Degbotse & Lazarus, 2011). Since the declaration to fight HIV/AIDS, a significant impact to save people's lives from being infected and dying from AIDS-related deaths has been noticeable. The achievements include a reduction in AIDS-related deaths by 47%, a reduction of HIV infections globally by 31%, and a reduction in vertical transmission of HIV by 54% (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2021).

Despite the remarkable progress in the global HIV response, the number of people with new HIV infections and AIDS-related deaths remains an ongoing concern. This is because globally, it is estimated that 37.7 million people are living with HIV, 680 000 people died from AIDS-related deaths and 1.5 million people were newly infected with HIV infections in 2020

(UNAIDS, 2021). Thus, the 2020 global target to reduce AIDS-related deaths and new HIV infections to fewer than 500 000 by the end of 2020 was not achieved. Therefore, there must be a concerted effort to intensify the fight against HIV/AIDS in Eastern and Southern Africa where more than half of the world's population living with HIV reside, because without doing so, it would be a serious challenge to achieve most of the global set targets for 2025 and 2030 (UNAIDS, 2021).

It has been documented that sub-Saharan Africa remains the worst affected region thus exceptional action is required to curb HIV/AIDS, particularly on women, adolescent girls, and children (Velloza et al., 2020; Kintu et al., 2020; Odugbesan & Rjoub, 2020). It is stated that in sub-Saharan Africa, the incidence of HIV among adolescent girls and young women (aged 15-24 years) remains high and are at higher risk to acquire HIV infection than their male peers (Cane et al., 2021; Cornell, Majola, Johnson & Dabula-Majola, 2021; Ramjee & Daniels, 2013). This may explain why a high number (15.9 million) of people living with HIV are females compared to men (9.8 million) in sub-Saharan Africa (UNAIDS, 2020) and AIDS-related illnesses remain the leading cause of death for women and adolescent girls between 15 and 49 years (Kiplagat et al., 2021; Zakeyo & Nyashanu, 2021; Tonen-Wolyec et al., 2020). Contrary, a study conducted in Ethiopia, Cameroon, Ghana and Zambia by Akuoko, Sandabunga, Akuoko and Sabogu (2021) found that even though more women were living with HIV/AIDS, AIDS-related deaths were higher among men than women and children.

In South Africa, the first case of HIV infection was first reported in 1982, and it was noted in patients that had received a blood transfusion, those who had haemophilia, and the gay community (Karim & Karim, 2002). The spread of HIV infection in South Africa showed a rapid increase in HIV prevalence as it rose from 0.7% in 1990 to 10.44% in 1995 and 22.4% in 2000 (Karim & Karim, 2002). Since then, in the early 2000s, the number of people living with HIV in South Africa has been significantly increasing from 3,8 million in 2002 to 8,2 million in 2021 (Statistics South Africa (Stats SA), 2021). Thus, SA remains the world's largest country affected by the HIV epidemic (UNAIDS, 2021). Consequently, new HIV infections were estimated at 230 000 in 2020 and these included 140 000 in women, 77 000 in men, and 12 000 infections from Mother To Child Transmissions (MTCT), with most of the new infections in children happening during the post-natal period (Pillay & Johnson, 2021; UNAIDS, 2021).

Despite the fact that the number of people living with HIV has been significantly increasing since 2002, it has to be acknowledged that South Africa has done incredible work to save the lives of the people and children living with HIV or exposed to HIV from AIDS-related deaths from 40% 30,4% of all adults' deaths in 2002 and that percentage has declined to 12,2% in 2021 (Stats SA, 2021), on one hand. On the other hand, the child mortality rate has declined from 55.3 deaths per thousand live births in 2002 to 24,1 deaths per thousand live births in 2021, and the MTCT rate declined from 4.3% in 2016 to 0,7% in 2019 (Massyn, Barron, Day, Ndlovu & Padarath, 2020). These undeniable gains can be attributed to a massive antiretroviral therapy (ART) programme roll-out and multiple prevention strategies which have increased the survival of the people living with HIV and prevented vertical transmission of HIV significantly.

Paediatric HIV infection remains a public concern as children exposed to HIV continue to contract the virus from their mothers during pregnancy, labour, delivery and post-natal during the breastfeeding period (Swain, et al., 2022; Degavi, et al., 2022; Van der Perre, et al., 2021). Great progress to eliminate vertical transmission of HIV to children has indeed been one of the noticeable achievements globally as new infections declined by 53% in the last decade (UNAIDS, 2021). However, the same cannot be said with the high burden of HIV such as in sub-Saharan Africa where rapid progress is needed to eliminate new HIV infections in children. It is reported that half of the new child infections globally are in only seven countries which are Nigeria 14%, Mozambique 8%, South Africa 8%, Tanzania 7%, Democratic Republic of Congo (DRC) 6%, Zambia 5%, and Uganda 3% (UNAIDS, 2021).

The fact is that children living with HIV grow and progress to adulthood hence various HIV prevention strategies are expanded and their impact is noticeable. However, as these prevention strategies are expanded and continuously updated, implementation processes must also be strengthened. Gaps in the implementation process prevent children exposed to HIV from fully benefiting from HIV prevention strategies and results in children exposed to HIV being left behind and later contracting the virus and dying due to HIV/AIDS-related illnesses (Gebremedhin, Alamneh, Hagos, Desalegn & Worku, 2021; Dovel, et al., 2021; Pellowski, et al., 2019). In 2020, gaps in the testing of children exposed to HIV left more than two-fifths of children living with HIV undiagnosed, and 46% of the world's children living with HIV were not benefiting from ART because treatment coverage among children living with HIV remains

low (54%) than among adults (74%) (UNAIDS, 2021). Based on this evidence, it is apparent that the implementation processes of HIV prevention strategies need to be strengthened to fully achieve the elimination of mother-to-child transmission (Remera et al., 2021; Wessels, et al., 2020; Goga, et al., 2018).

2.3 HIV PREVENTION STRATEGIES AND THEIR IMPACT ON PMTCT

HIV prevention strategies are defined as interventions that aim to stop the transmission of HIV and are often implemented to prevent the spread of HIV infection directly to the individual at risk and indirectly to the larger population at risk (Wand et al., 2018; UNAIDS, 2020). The HIV prevention strategies discussed below include Pre-Exposure Prophylaxis (PrEP), Voluntary Medical Male Circumcision (VMMC), behavioural change and condom use, and Prevention of Mother-To-Child Transmission (PMTCT).

2.3.1 Pre-exposure prophylaxis (PrEP)

Oral PrEP is a new biomedical prevention method for people who are at a higher risk of acquiring HIV (often time either from being in a romantic relationship with a partner that is living with HIV or being involved in other activities such as working as a sex worker), and those people take an oral PrEP on a daily basis to reduce their chances of being infected by HIV. PrEP is a composition of two antiretroviral drugs (tenofovir disoproxil fumarate and emtricitabine) which are highly effective at preventing HIV infection to HIV negative people that are exposed to HIV (Greenwald et al., 2019; Irungu & Baeten, 2020; WHO, 2015).

The effectiveness of PrEP has been found to have the potential to accelerate the reductions in HIV incidents. Previous research from Australia, Canada, the United States of America, and sub-Saharan African countries found that oral PrEP contributes to reductions in new HIV infections. Furthermore, PrEP has been associated with decreases in HIV diagnosis (John, Whitfield, Rendina, Parsons & Grov, 2018; O`Malley, Barnabee & Mugwanya, 2019; Greenwald et al., 2019; Irungu & Baeten, 2020). Oral PrEP, as an additional HIV prevention method, remains beneficial particularly in a country such as South Africa with a high prevalence of HIV infections because women continue to acquire HIV during pregnancy and breastfeeding, which poses a risk of transmitting HIV to their infants (Davey et al., 2019; Pillay et al., 2020). Studies have shown that PrEP can reduce HIV incidence and vertical transmission.

Therefore, women tend to be highly motivated to continue with PrEP to ensure that their infants remain HIV-free (Pintye et al., 2017; Zorrilla et al., 2018; Matthews et al., 2019; Davey et al., 2020). However, overcoming uptake of and adherence to PrEP remain a serious challenge that is reported by some studies in literature (Sidebottom, Ekstrom & Stromdahl, 2018; John, Walsh, Pleuhs, Wesche, Quinn & Petroll, 2021; Abou Ghayda et al., 2020; Koss et al., 2021; Haberer et al., 2021; Felsher et al., 2021; Muhumuza et al., 2021; Pintye, et al., 2021). In South Africa, 57% was reported for lack of uptake and 43% of the participants had been offered oral PrEP but had declined (Pillay, et al., 2020). In Kenya, out of 93 women who participated, 21 never initiated PrEP, 48 discontinued less than 3 months and only 24 persisted for more than 3-6 months (Pintye, et al., 2021). Furthermore, in Zimbabwe, out of 55 participants, 10% declined PrEP and 27% discontinued it before 6 months (Gombe, et al., 2020).

However, evidence from the United States of America, Thailand, Nigeria, Uganda, and South Africa, reiterate that PrEP uptake is often linked to personal and environmental factors that need to be considered for successful PrEP roll-out. Thus, interventions to promote PrEP should focus on ways that can inspire PrEP uptake (Muhumuza, et al., 2021; Emmanuel et al., 2020; Felsher et al., 2020; Ghayda et al., 2020).

2.3.2 Voluntary medical male circumcision

In 2011, the World Health Organisation (WHO) and UNAIDS released a strategic framework outlining Voluntary Medical Male Circumcision (VMMC) implementation, particularly in countries with high HIV prevalence and low male circumcision (Nxumalo & Mchunu, 2019). Voluntary Medical Male Circumcision (VMMC) has been accepted by global HIV policy as one of the valuable additional HIV prevention strategies, thus many southern African countries have incorporated VMMC into their national HIV prevention strategies (Bulled & Green, 2016, UNAIDS, 2020). The UNAIDS recommended increasing VMMC as part of a fast-track strategy to reduce HIV transmission, particularly in high-prevalence countries (Kripke et al., 2016).

Scientific evidence from sub-Saharan African countries such as Uganda, Kenya, and South Africa showed that VMMC reduced the risk of female-to-male HIV acquisition by up to 60% (Ngcobo, Woolvaardt, Bac & Webb, 2018; Gilbertson et al., 2019, Fleming et al., 2021; Palmer, Rau & Engelbrecht, 2020). Therefore, it is important to ensure that the implementation

of this prevention method is accelerated not only to meet the 80% VMMC coverage aged 15-49 years old, but also the new complementary targets of 90% VMMC coverage in adolescent boys and young men aged 10-29 years which were set in 2016 (Kripte et al., 2016; Palmer et al., 2020; Thomas et al., 2021). As much as VMMC contributes to the reduction of HIV transmission, it is essential to ensure that implementation of VMMC is accelerated across age and cultural groups; particularly because evidence has found that implementation of VMMC is compromised by poor training of professional nurses who are implementing the services. Therefore, the need for training is crucial for a successful implementation of the VMMC (Nxumalo & Mchunu, 2020; Feldacker, et al., 2020; Mavhu, et al., 2021).

2.3.3 Behaviour change and condom use

A successful reduction in HIV transmission requires a concerted effort from individuals to commit to using a condom to further prevent the spread of HIV infections. The increase in condom use plays a critical role in the decline of HIV incidents, on one hand. On the other hand, the lack of using a condom consistently threatens the effectiveness of this prevention method hence there is a serious decline in condom use (Duby et al., 2021; Gao et al., 2021; Ntshiqa et al., 2018). It is critical that behavioural and social factors such as engaging in unprotected sex, multiple sexual partners, and engaging in sex for monetary gains among others, are sensitised enough to use a condom because of the high-risk involved concerning the transmission of HIV (Nganda, Komen & Mbogoh, 2020).

Previous research has found that when condoms are used in the right way and consistently, the risk of contracting HIV infection is significantly low (Ntshiqa et al., 2021; Mwaba, Menon & Kusanthan, 2020). However, this does not mean condom use is one hundred per cent effective in protection against HIV and other sexually acquired conditions such as sexually transmitted infections (STIs) and pregnancy. Consequently, a combination of HIV prevention strategies coupled with HIV testing is recommended (Laher et al., 2020).

The condom-use prevention strategy mostly relies on the willingness to use a condom which is strongly linked to the behaviour and attitude towards condom use. Therefore, behavioural change remains essential to reducing the spread of HIV infections. In addition, behavioural change counselling interventions that are aimed at increasing condom use consistently, having one sexual partner and preventing STIs have demonstrated success. Therefore, these strategies

remain the core standard of care for HIV prevention efforts (Elshiekh, Hoving & De Vries, 2020; Henderson et al., 2020; Reza et al., 2020). However, the successful implementation of the interventions to bring about such behavioural change is a major challenge (Ayele, Tegegne, Damtie, Chanie & Mekonen, 2021; Elshiekh, De Vries & Hoving, 2021; Gore, Yeravdekar, Juvekar & Gangakhedkar, 2021). These challenges remain a serious concern to the elimination of MTCT particularly because it has been reported that men often time than not, refuse to test for HIV and to use a condom (Rodriguez, Parrish, Jones & Peltzer, 2020; Hampanda, et al., 2020; Chibango, 2020).

2.3.4 Prevention of mother to child transmission (PMTCT)

While all other HIV prevention strategies were implemented, globally, efforts to fight HIV and AIDS particularly to protect children from contracting HIV and dying from AIDS-related illnesses were seen when the PMTCT programme was developed and recommended to be adopted by all member states in the early 2000s (UNAIDS, 2015). From the beginning, the PMTCT's major aim was to protect children from being infected by HIV from their mothers during pregnancy, labour, delivery and post-partum; for instance during the breastfeeding period. Worldwide, an estimated 1.7 million children were living with HIV and there were 95 000 AIDS-related deaths in 2019 (UNAIDS, 2020). Although there has been noticeable global progress regarding a decline in new HIV infections among children, from 320 000 in 2010 to 150 000 in 2019, a high number (84%) of child HIV infections occur in Sub-Saharan Africa (UNAIDS, 2020).

South Africa is one of the sub-Saharan African countries that remains severely affected by HIV and AIDS. However, since South Africa officially adopted the PMTCT programme early in the year 2000s, there has been great progress in the prevention of MTCT and child mortality due to AIDS-related illnesses (Goga, et al., 2019). The infant mortality rate has declined from an estimated 55,5 infant deaths per 1000 live births in 2002 to 23,6 infant deaths per thousand live births in 2020; whereas the under-five mortality rate has declined from 75,3 child deaths per thousand live births to 34,1 child deaths per thousand live births between 2002 and 2020 (Stats SA, 2021). In 2020, the MTCT rate in South Africa was (4%), Uganda (6%), Tanzania (11%), Zambia and Mozambique (13%), Nigeria (25), DRC (28%) and a notable low rate in Botswana (2%) (UNAIDS, 2021). However, South Africa has reduced the number of children

contracting HIV by more than 70% thus vertical transmission programme yielded striking results by showing a significant decline from 4.3% in 2016 to 0.7% in 2019 (Massyn, et al., 2020). The progress noted here confirms that there are great benefits in the implementation of the PMTCT programme such as preventing vertical transmission, Early Infant Diagnosis (EID) and treatment initiation, safe breastfeeding methods and subsequently prevent child mortality from AIDS-related illnesses, to list a few (Dovel, et al., 2021; King et al., 2020; Redinger, et al., 2020).

It is undeniable that the benefits of the PMTCT programme and its current progress on maternal and child health outcomes are noticeable at the national level in South Africa. However, despite the highlighted benefits of the PMTCT, mother-to-child transmission of HIV during the post-natal care period persists in children exposed to HIV, particularly in rural areas (Goga et al., 2018). This is noted in the Eastern Cape Province, Amathole sub-district (2.3%) and the North West Province, Ngaka Modiri Molema (1.0%) where MTCT remains even higher than the national average which is 0.7% compared to urban provinces such as the Western Cape (0.3%) (Massyn et al., 2020). Consequently, eliminating vertical transmission of HIV requires a deliberate improvement in the implementation of programmes such as PMTCT.

2.4 HEALTHCARE DELIVERY IN SOUTH AFRICA BETWEEN URBAN AND RURAL AREAS

Singh, Magula, Hariparshad and Assounga (2017), refer to an urban area as a "residential area where roads are formally planned and maintained by the authorities and services such as water, sewage removal, electricity and refuse removal are provided. Whereas rural area refers to an area which is not classified as urban and may comprise tribal areas, commercial farms and informal settlements." In South Africa, there is a vast difference between rural and urban areas, especially concerning health care services. These differences are seen in the socio-economic, and geographic lines and unequal distribution of health resources between urban and rural communities. A significant percentage, 43.6% of the population live in rural areas but they are served by few nurses (all categories) than in urban communities. In addition, this exacerbates the inequalities in access to high-quality care (Besada, et al., 2020). Shortage of skilled professional nurses coupled with HIV test kits and medicine stock-outs are more prevalent in rural facilities than urban facilities (Karimi, Mishra, Natarajan & Sinha, 2021; Kuwawenaruwa,

Wyss, Wiedenmayer & Metta, 2020; Taylor, 2020; Hodes, Prince, Bungane, Toska & Cluver, 2017). The unavailability of these essential resources significantly compromises the implementation of the PMTCT services for children exposed to HIV in rural areas.

Furthermore, geographical lines in the rural areas where healthcare facilities are far from where people live, compromise the implementation of the PMTCT services. This means mothers of children exposed to HIV would have to travel a long distance to the facility which poses a serious challenge to EMTCT. Given that rural communities are faced with poverty where every little cent in the household is a channel to buy food, mothers of children exposed to HIV have to stress about attending healthcare facilities which are often far as they do not have money for transport. In addition, for those that would have transport money at times the transport itself is unavailable.

The other aspect compromises the implementation of the PMTCT services particularly in the rural areas where the cultural practice is vibrant. Mothers of children exposed to HIV are sometimes pressurised by family members or their partners to make use of traditional medicine and expect mothers to breastfeed without considering their HIV status, which poses a serious risk for MTCT to persist (Herce et al., 2021; Naydal, Munyaw, Bruun & Brantsaeter, 2021; Dirisu, et al., 2020; Kisigo, et al., 2020; Le Roux, et al., 2020; Devkota, et al., 2020; Kifle, et al., 2019).

Given these disparities, it is clear that the success of the elimination of MTCT of HIV requires a context-based intervention especially now that the country is working towards achieving the elimination of MTCT and significantly reducing child mortality. Hence, it is imperative to establish various major challenges that hinder the implementation of the PMTCT in the rural setting and subsequently design tailored context-based intervention strategies that would assist in achieving the elimination of MTCT targets by 2030.

The PMTCT programme has been evolving and guided by scientific evidence to strengthen its effectiveness. However, studies continue to point out that inadequate implementation of the PMTCT services remains a major contributor to the persistence of MTCT, particularly in rural areas (Dirisu, et al., 2020; Pillay & Johnson, 2021; King, et al., 2020; Mongwenyana, et al., 2020; Suryavanshi, et al., 2018).

2.5 CHALLENGES IN THE IMPLEMENTATION OF THE PMTCT PROGRAMME IN THE RURAL AREAS

The implementation of the PMTCT programme highly depends on and is influenced by knowledge, attitude, and self-confidence in the management of mothers living with HIV and their children during the post-partum period. Thus, effective implementation of the PMTCT requires a comprehensive understanding of the guidelines from those who are at the forefront (professional nurses) when it comes to implementation. More so, because SA has experienced constant evolution of the PMTCT guidelines, hence it is imperative that registered nurses are well trained and receive continuous in-service training to keep up with constant updates in the PMTCT guidelines.

Previous studies revealed that PMTCT services continue to be inadequately implemented at some healthcare facilities owing to insufficient staff training which remains a serious challenge to the success of the PMTCT particularly in rural areas (Mboweni & Makhado, 2020; Mwendera et al., 2019; Mangoejane & Ramukumba, 2019; Rodriguez & Walters, 2017). The need for adequate training as a contributing factor to the success of PMTCT services has been confirmed numerous times (Mutabazi, et al., 2020; Mohamed, et al., 2020; Hanrahan and Williams, 2017).

The PMTCT services in rural healthcare facilities are led by professional nurses and often time specialist clinicians are not always available on-site. Accordingly, it is critical to have highly skilled trained staff working in the rural facilities. In addition, having highly skilled professional nurses allows for the provision of services to be consistently delivered and avoids situations where mothers and their children exposed to HIV are sent back because a particular staff member who is highly trained and knowledgeable to perform certain skills is not available.

Thus, the shortage of staff in rural areas should be viewed together with a shortage of highly skilled staff because having an adequate number of staff who are not adequately trained does not solve the problem but ends up putting more workload on the few that are trained (Mongwenyana, et al., 2020; Mutabazi, et al., 2020). Therefore, it is critical that all professional nurses working in rural healthcare facilities be trained on Nurse-Initiated Management of Antiretroviral Therapy (NIMART), and PMTCT guidelines. Refresher training and workshops

should be conducted on-site to adequately provide necessary childcare to children exposed to HIV and be able to identify danger signs (Habedi, 2020; Mackay, Gross, Hepburn & Spangler, 2020). An adequate number of staff coupled with trained staff would not only improve the implementation of the PMTCT services, but it has the potential to significantly reduce long waiting times at the facilities which have become a serious challenge that affects the implementation of services to children exposed to HIV.

Another challenge that hinders the adequate implementation of the PMTCT in rural areas is the time spent by mothers of children exposed to HIV, waiting to receive services at the facilities (Feleke & Wasie, 2018). Long waiting times that are experienced by mothers and caregivers is attributed to the shortage of staff (Habedi, 2020; Maputle, Ramavhoya, Makhado & Lebese, 2020). It has been revealed that mothers, during clinic visits, wait in the queue for a very long time and end up leaving before being seen by healthcare workers (Sutcliffe et al., 2020; Suryavanshi et al., 2018; Rodriguez & Walters, 2017).

The consequences of long waiting times lead to missed infant HIV testing which is critical for Early Infant Diagnosis (EID). The studies conducted in Mozambique, Malawi, Ethiopia, and South Africa, reveal that EID provides HIV-exposed children with an opportunity to receive early treatment and prevent child mortality (Matsinhe, et al., 2021; Makanda, 2020; Ebuy, Bekele & Redae, 2020; Naidoo, et al., 2020). The evidence above shows that the necessary care for children exposed to HIV gets compromised when mothers leave the facility after waiting for too long. At times, they are sent back home and told to come back the following day because the professional nurses have to knock off (Kassaw, Matula, Abebe, Kassie & Abate, 2020; Akunda, et al., 2020).

Nonetheless, it appears that long waiting time is not the only reason that leads mothers of HIV-exposed children to leave the facility before their children receive much-needed care as highlighted in studies conducted in South Africa, Malawi, and Tanzania that mothers left the facilities before being seen because of the negative attitude of professional nurses (Watkins, Griffiths & Goudge, 2021; Razzaq, Raynes-Greenow & Alam, 2021; Mpinganjira, Tchereni, Gunda & Mwapasa, 2020). It is undoubtedly the consequences of long waiting times which are attributed to the shortage of staff and negative attitude of professional nurses towards the mothers of HIV-exposed children, which all leads to mothers leaving the facility without

receiving care and increase the risk of loss to follow-up (LTFU) (Ankunda, et al., 2020; Ebuy, Bekele & Redae, 2020; Pilgrim et al., 2018).

Retaining HIV-exposed children in care is critical to improving the implementation of the PMTCT services, hence other challenges that have a potential to result in LTFU such as delayed HIV PCR test results turn-around time, cannot be ignored because it continues to weaken the implementation of the PMTCT services for HIV-exposed children, particularly in rural areas.

A delay in returning HIV PCR test results remains a serious challenge for many reasons over and above LTFU that occurs when mothers stop visiting the facility after so many attempts without getting the child's results. Other challenges that are often caused by delayed test results' return are missed opportunities for EID, and late treatment initiation, which unfortunately can result in child mortality (Nydal, Munyaw, Bruun & Brantsaeter, 2021; Gaitho, et al., 2021; Teasdale, et al., 2020). Moreover, late results' turnaround time and non-receipt of test results undermine the purpose of EID and subsequently the implementation of the PMTCT services (Thiha et al., 2017).

In rural health facilities, the challenge of late results return is exacerbated by the fact that rural facilities do not have a laboratory on-site or closer to the healthcare facility. Studies conducted in Cameroon, Eswatini, Lesotho, Rwanda, Zimbabwe, Zambia, Ghana, Nigeria, and South Africa show that laboratory-based for EID, time-consuming sample transportation to central laboratories, long waiting time for results were the serious challenges that limit the capabilities of the PMTCT services (Bianchi, et al., 2020; Sutcliffe, et al., 2020; Ankrah & Dako-Gayeke, 2021; Anaba, et al., 2019; Mlambo, Phaswana-Mafuya, Peltzer & Penn, 2018).

Having a laboratory on site or closer to the health facility, has been found to have satisfactory outcomes with regard to HIV test results' return. A study conducted in Ethiopia by Ebuy et al., (2020) which was conducted at a healthcare facility that is in the same city as the laboratory where HIV PCR tests are processed, found that the results were received timeously. In similar studies conducted with professional nurses regarding point-of-care (POC), it was reported that healthcare workers were satisfied with the fast HIV test results turnaround time and the ability to initiate treatment for an infant that tested positive sooner (Domaoal, et al., 2021; Bianchi, et al., 2020, Yee, et al., 2020). The delay of HIV PCR test results does not only compromise children exposed to HIV and causes prolonged stress for mothers to wait a long time without

knowing their children's HIV status, but it also affects mothers financially because of the multiple visits they have to make hoping that they will find the results available according to a stipulated date.

Post-natal healthcare visits' attendance is essential for the life of children exposed to HIV. However, some of the challenges that are facing mothers in rural areas that result in missing facility appointments are transport-related (Besada, et al., 2020; Malande, et al., 2019). This problem mostly affects rural communities because of their socio-economic status. Previous studies found that lack of money for transport was a major challenge that resulted in mothers and their children not attending appointments (Dirisu, et al., 2020; Coulon et al., 2019; Suryavanshi et al., 2018).

Despite these challenges, some of the mothers take extreme measures to make sure that their children are not hindered by transport costs from accessing care. Studies conducted in Ghana, South Africa, Uganda, and Kenya found that mothers had to borrow money from friends to take the child for a follow-up appointment. At times, mothers resort to hiking for lifts while others embark on a long walk to the clinic. Sometimes mothers ask relatives or friends who relatively live nearer to the facility to sleep over at their homes and wake up the following day to visit a facility because they live very far from the facility (Domapielle, Akurugu & Mdee, 2020; Laurenzi, et al., 2020; Tumuhimbise et al., 2020; Zakayo, et al., 2020).

However, it is encouraging that mothers or caregivers, at times, do everything in their power to play a major role in keeping their children healthy and free from HIV. Hence, transport in the rural areas needs to be improved, even for those who have money for transport. In most rural areas, transport that goes to the clinic, town and to other public facilities is intermittently available only in the morning and afternoon. If mothers miss an early transport, they end up not going to the healthcare facility on that day, and this poses a serious challenge (Boro & Saikia, 2020; Ebonwu et al., 2018). The lack of transport in the rural areas requires serious attention because the majority of mothers rely on public transport, as reported by Ngandu et al., (2019) that only 4% of women used their cars to travel to the clinic compared to 77.1% that reached the clinic by walking or using public transport.

Overall, these challenges continue to hinder access to healthcare for children exposed to HIV. Given that in some rural areas clinics are far from where people live, if mothers do not have

money for transport, and they cannot even try to walk to a clinic to honour follow-up appointments, then LTFU remains unavoidable. Disclosure of HIV status and support are key to PMTCT adherence (Helova, et al., 2021; Hamilton, le Roux, Young & Sodergard, 2020). Thus, it is essential to encourage mothers of children exposed to HIV to disclose their status to families, husbands, and partners. Once that is done, families, husbands and partners need to be cognizant of the importance and benefit of supporting mothers after disclosing their status.

A mother's failure to disclose their HIV status either to the family, husband or partner leads to poor support and increases the risk of MTCT during the breastfeeding period where mixed-feeding could happen because no one knows the mother's status at home. In rural areas, often time, mothers, particularly young mothers, tend to leave their young babies with their parents or caregivers without having informed them about their status and why they should not mix-feed the baby (Mlambo & Peltzer, 2020; McDonald, Aubel, Aidam & Girard, 2020). Moreover, in rural areas, home births are common (Dongarwar & Salihu, 2020; Katzen, et al., 2020; Chea, et al., 2018), therefore non-disclosure of a mother's HIV status remains a serious challenge because all the necessary management that is supposed to be initiated at birth ends up not being done; especially if a baby is not taken to a healthcare facility soon after delivery. This significantly hinders the proper implementation of the PMTCT services.

A study conducted in Nigeria by Afolabi, Bakarey, Kolawole and Kola (2018) found that the risk of MTCT of HIV was higher among infants delivered at home compared to those that are delivered at the healthcare facility. In addition, mixed feeding was two times higher compared to exclusive breastfeeding. It is high time that aspects that interfere with PMTCT such as cultural practices that lead to mixed feeding be given serious attention and modification in cultural practices be made where necessary to allow children exposed to HIV to fully benefit from the PMTCT programme. Another study conducted in the rural areas in Ghana, by Nsiah-Asamoah, Doku and Agblorti (2020) found that a tradition of giving corn flour mixed with water or light porridge during the first few days after birth to welcome new-borns was common.

2.6 CHAPTER SUMMARY

This chapter reviewed the literature relating to the HIV epidemic, HIV prevention strategies, the implementation of the PMTCT programme pertaining to children exposed to HIV, healthcare delivery in South Africa between urban and rural areas and challenges that hinder

the implementation of the PMTCT in the rural areas. Consequently, it was concluded that context-based intervention strategies are needed to successfully overcome the challenges that lead to inadequate implementation of PMTCT services in rural areas. The next chapter addresses the design and methods applied in this study.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter aims to outline the research designs and methods that were used in this study. Intervention research is research that is carried out with the purpose of conceiving, creating, and testing innovative human services' approach (Fouché, Strydom & Roestenburg, 2021). This can be guided by different models. However, in this study, the researcher chose the intervention research design and development (IR: D&D) as discussed by Fouché et al. (2021) to be used as a model that drives this study.

In applying the IR: D&D model, this study was conducted in three steps which include: (1) problem analysis and project planning (empirical data), (2) information gathering (existing data through integrative literature review), and (3) design (using concluding statements from integrative review and empirical data). This chapter would discuss how the design using the IR: D&D model was followed. Further to that, this chapter will discuss the steps that were taken to ensure scientific rigour, the ethical standards ensured in this study, and the conclusion of the chapter.

3.2 INTERVENTION RESEARCH APPROACH

According to Fraser and Galinsky (2010), intervention research is a systematic study of purposive change strategies that is characterised by both the design and development of an intervention. Intervention research is understood as research that is carried out to create means to improve the health and well-being of society, thus involving creativity and innovation by coming up with new strategies that can bring new solutions to persistent problems in the community (Fouché et al., 2021). This approach permits the researcher to enhance a strong partnership formation with stakeholders in an attempt to address a specific problem (Erl, 2013), thus presenting an opportunity to design an intervention strategy that is contextually tailored and viable to be applied to practical problems.

As indicated by Fraser and Galinsky (2010), creating an intervention strategy that is consistent with the nuances of the setting, requires highly contextual-based knowledge. Gitlin and Czaja (2016) also argue that the majority of health care problems are connected to behavioural patterns which need intervention. Therefore, a context plays a critical role in effective intervention designing, hence it is pivotal to include various key people and multiple layers of the context from the beginning (Fouché et al., 2021). It is, therefore, not surprising that Burns and Grove (2009) pointed out way earlier that nursing studies must focus on designing and testing interventions in order to respond to community health care issues.

It was in this regard that the intervention research was the researcher's choice because this study adopted the constructivist philosophical worldview, which assumes that reality and knowledge cannot be discovered by the researcher alone but are constructed through the process of interaction between a researcher and participants (De Vos et al., 2011). Thus, it was essential to purposely bring the relevant stakeholders, particularly the PMTCT implementers and end users (Mothers) to be part of the process when designing an intervention strategy to point out deeper contextual hindrances that have a potential to affect the practice which might be missed by a researcher.

Given that the study was about the design of the intervention strategy, it was critical to find a model that would guide the design of an intervention effectively and in an orderly manner. The researcher was, therefore, convinced that the IR: D&D model as delineated by Fouché et al. (2021) has the most structured process and is suitable to guide the study and produce the outcome of this research study; which was to design the intervention strategy to improve implementation of the PMTCT programme for HIV-exposed children at a rural sub-district in the North West Province.

3.2.1 Intervention research - design and development model

As Fraser and Galinsky (2010) and Fouché et al. (2021) indicate, Thomas and Rothmans (1994) were the pioneers of the IR: D&D model in social science. Since then, the IR: D&D model has been adapted by several researchers such as Burns and Grove (2009); Fraser, Richman, Galinsky and Day (2009); Fraser and Galinsky (2010); Gitlin and Czaja (2015); McBride (2016), including Fouché et al. (2021) to mention a few. The IR: D&D comprises six steps,

each step of the IR: D&D model has distinctive key activities that should be followed to complete a certain step (Fouché et al., 2021) as depicted in Figures 3.1 below.

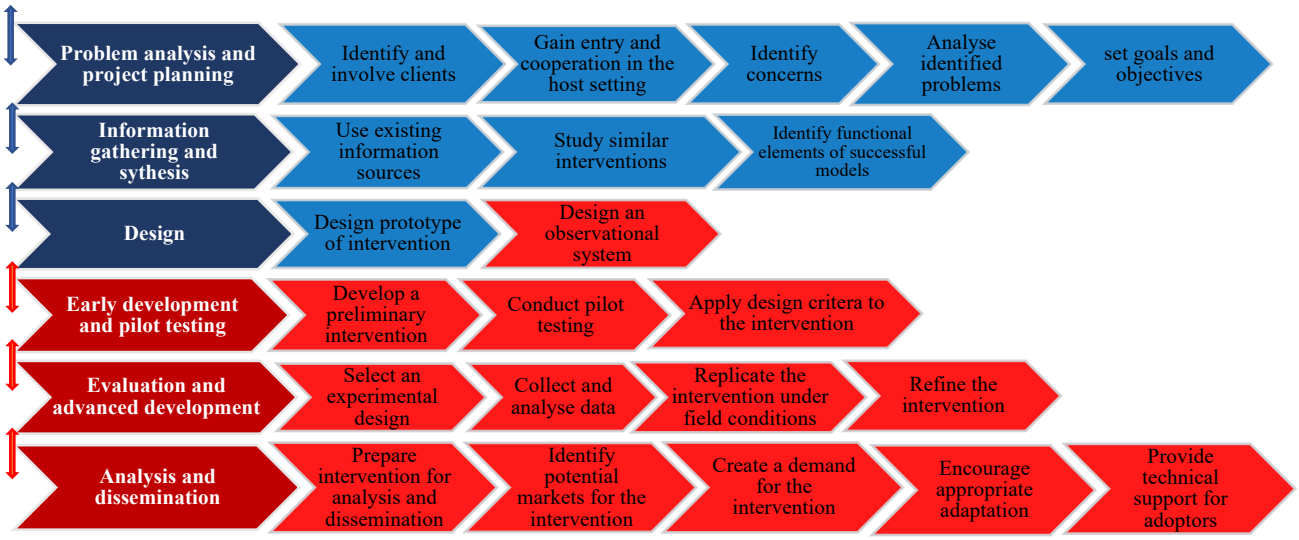

Figure 3-1: Steps and key activities of IR: D&D model (Fouché et al., 2021:466)

The IR: D&D model's six steps can be viewed as two main parts that a researcher can focus on. These are (1) designing the intervention which covers Steps 1-3 and (2) developing the intervention by testing the efficacy and effectiveness which covers Steps 4-6 (Fouché et al., 2021). However, it is not uncommon for researchers to focus on one of the two main parts at a time (designing the intervention or developing and piloting), especially if there are time limits in the project and or a lack of resources because the processes of IR: D&D steps, if applied in their entirety, can unfold over years (Fouché et al., 2021). Therefore, out of the six steps of the IR: D&D model, this study covered Steps 1-3 (part 1), namely: (1) problem analysis and project planning, (2) information gathering and synthesis, and (3) the design. The reason to end at step 3 (part 1), was because the main objective of this study was to design an intervention strategy. Thus, the rest of the IR: D&D steps (part 2) including the design of the observational system were not covered by this study. Table 3.1 depicts the IR: D&D process as applied in this study in relation to the study objectives.

Table 3.1 The IR: D&D steps (part 1) as applied in this study

OBJECTIVES OF THE STUDY	IR: D&D STEPS (1-3)	IR: D&D ACTIVITIES	ACTIVITIES IN THE STUDY
2. To explore the professional nurses' perceptions and attitudes on the PMTCT programme implementation pertaining to HIV-exposed children **3**. To explore the perceptions of parents (of children exposed to HIV) on childcare received in the rural sub-district health care facilities **4**. To explore the parents' or caregivers' perceptions of their role in the prevention of the spread of HIV infection to their children	1. Problem analysis and project planning	Identify and involve clients, and gain entry and cooperation	Selection and recruitment of participants
		Identify concerns	Conduct individual interviews
		Analyse identified concerns	Data analysis
		Set goals and objectives	Design an intervention strategy to solve the problem
1. To conduct an integrative literature review to explore the characteristics of different intervention strategies used to improve the implementation of health policies globally and particularly in the rural areas	2. Information gathering and synthesis	Use existing information sources, and study similar interventions	Conducted integrative literature review
		Identify functional elements of successful interventions	Analysis of different interventions and identifying their characteristics
5. To design an intervention strategy to improve PMTCT programme implementation for HIV-exposed children in the rural sub-district in North West Province	3. Design	Design prototype of the intervention	Drawing conclusion statements from empirical data and integrative review

3.3 PROBLEM ANALYSIS AND PROJECT PLANNING [IR: D&D STEP 1]

This step is going to deal with objectives one, two and three according to the D&D model as delineated by Fouché et al. (2021) and describe a thorough process as to how the first step and its activities were implemented in this study. However, for the researcher to start describing that process, it is essential to commence by providing the study setting.

3.3.1 Study setting

The study was conducted in the North West Province, South Africa. The NW Province comprises four districts: namely, Bojanala Platinum District, Ngaka Modiri Molema District, DR. Ruth Segomotsi Mompati District and DR. Kenneth Kaunda District. The district chosen for this study was the Ngaka Modiri Molema (NMM) District which comprises five sub-districts: namely, Mahikeng, Ratlou, Ramatshere Moiloa, Ditsobotla and Tswaing sub-districts.

Ngaka Modiri Molema is situated centrally in the province, and it shares an international border with Botswana. The district is a predominantly rural district with an estimated population of 968 781 (Stats SA, 2019). There is no tertiary hospital in the NMM district. To further delineate the study, two sub-districts were chosen namely Mahikeng and Ditsobotla. There is one regional hospital which is at Mahikeng sub-district. Over and above that, Mahikeng had one district hospital, four Community Health Centres (CHC) and 25 clinics. Whereas, Ditsobotla had two district hospitals, 2 CHCs and 15 clinics (Massyn, Tanna, Day & Ndlovu, 2020). PMTCT is mainly implemented in CHCs in these sub-districts hence one CHC per district was chosen as the site of the study.

This rural district was reported to have a stock-out of medicine and a high rate of child-positive Polymerase Chain Reaction (PCR) tests reported in sub-districts to be higher than 1.2% (Mahikeng), and 0.95% (Ditsobotla) (Massy et al., 2020). In addition, HIV positive tests at 19 months were 2.8% compared to the SA average of 1.6%. The mother post-natal visit, 6 days after delivery was reported to be worse (65.5%) in these sub-districts (Massyn, et al., 2020). Therefore, the researcher was of the view that the chosen healthcare facilities provided the needed data for the study. It is important to mention that the study setting for phases one and two were the same; hence, the setting would not be described in phase two of this study.

3.3.2 Identification of and involving clients, and gaining entry

This study was about designing an intervention strategy to improve the implementation of the PMTCT programme; therefore, it was crucial to identify and involve participants that have significant experience regarding PMTCT services. Burns and Grove (2009) encourage the researchers to involve key informants that are in the clinical setting especially if the researcher is not practising in the setting. Hence, this study included professional nurses and mothers of children exposed to HIV.

The participants that were involved in this study fit the description of Fouché et al. (2021) that states that the identified problem scale can only be achievable by involving participants who experience and are living with the problem. Thus, in this study, professional nurses as the implementers of the PMTCT services and mothers of children exposed to HIV as end users who experience the persistent problem of mother-to-child transmission of HIV were involved.

Gaining entry to the healthcare facilities happened after ethical clearance from the university was obtained to conduct this study as well as the permission letter from the Department of Health in the North West Province. Gaining entry through key informants and gatekeepers is crucial, hence the researcher wrote an e-mail to the facility managers requesting access to the healthcare facility. Ethical clearance and permission letters as well as study information were attached to the sent e-mail. Then facility managers granted access without a problem. The researcher was convinced that it happened because he firstly contacted the facility managers and respectfully introduced himself and explained the study to them. This behaviour proves the point of Fouché et al. (2021) that researchers who treat gatekeepers and key informants with respect are likely to obtain permission more easily.

As a result of the researcher's respectful approach during this process, the key informants were supportive, cooperative, and willing to assist fully. De Vos et al. (2011) state that building a relationship with the key informant and gatekeepers helps the researcher to gain the cooperation and support needed to conduct the study. The researcher gained access to participants (professional nurses and mothers of children exposed to HIV) because of the support and cooperation of the key informants at the healthcare facilities.

3.3.3 Identifying the concerns of the target population

Fouché et al. (2021) reiterate that after gaining entry to the setting, the researcher should avoid projecting only the external views of the problem and proposed solutions but there must be attempts to understand the issues of importance to the target population. Multiple methods, including in-depth interviews with the participants, quantitative surveys and community forums could be used to obtain inside perspectives (Fouché et al., 2021). In this study, the researcher conducted individual interviews with the participants (professional nurses and mothers of children exposed to HIV) to obtain as much information as possible and understand the dynamics and severity of the problem on the ground.

3.3.4 Analysing the identified concerns

After the empirical information was obtained which explains the scope of the problem from multiple perspectives, a thorough analysis process was conducted. The researcher integrated all the empirical evidence into a discussion report.

3.3.5 Set goals and objectives

After the analysis was done, which enabled the researcher to identify areas of weak points and gaps, a conclusion statement was made, and a set specific outcome was to design an intervention strategy that has the potential to improve the implementation of the PMTCT programme.

3.4 EXPLORATORY QUALITATIVE DESCRIPTIVE DESIGN

A research design is defined as a plan or blueprint set out by a researcher on how the study is going to be conducted; it also gives a clear direction and clarification on the processes and procedures to be followed at each level of the study (Burns & Grove, 2009). In this second part of phase one of the study, it was crucial to choose the research design that was best suited to address the study objectives effectively, hence the qualitative exploratory, descriptive research design was applied in the study.

The exploratory and descriptive design provided the researcher with an opportunity to gain a comprehensive understanding of the phenomenon from the participants' different views and

the nature of their realities (De Vos et al., 2011), which is well aligned with the constructivist worldview applied in this study.

3.4.1 Qualitative research

The qualitative research is well aligned with the constructivist philosophical beliefs which guided this entire study project as detailed in chapter one of this study. It is said that the philosophical base of qualitative research is underpinned by a worldview that is holistic and draws upon the position that there are multiple constructed realities; the knower and known are inseparable and thus knowledge is co-constructed with the researcher (Burns & Grove, 2011). It is for that reason that qualitative research was found to be suitable in this study because the researcher was committed to the naturalistic perspective and the interpretative understanding of human perceptions (De Vos et al., 2011). Botma et al. (2010) concur that people construct their understanding and knowledge of the world through experiencing things and reflecting on such experiences. Thus, the researcher deemed the qualitative research methods appropriate to explore the multiple realities from the perspective of an insider (professional nurses and mothers of children exposed to HIV) as opposed to that of an outsider, which is predominant in the quantitative paradigm (De Vos et al., 2011; Green & Thorogood, 2018).

3.4.2 Exploratory design

Exploratory research aims to explore a phenomenon, particularly when little is known about a problem to find out more information and acquire new insight (Green & Thorogood, 2018). Exploratory research is appropriate to explore the full nature of the phenomenon in an attempt to understand how it is experienced by those who live it (Polit & Beck, 2013). Thus, De Vos et al. (2011) state that exploratory research ascends out of the lack of information about the phenomenon.

The exploratory design was, therefore, appropriate to explore the professional nurses' perceptions and their attitudes about the implementation of the PMTCT programme, and the mothers' perceptions of the care their children receive in the healthcare facility, as well as their role (as mothers of children exposed to HIV) that they play to protect their children/child from being infected by HIV. In this study, it was imperative that the researcher firstly conduct an

exploratory study to gain a deeper understanding of the providers of the PMTCT programme and those that are at the receiving end of the PMTCT programme.

3.4.3 Descriptive design

According to Burns and Grove (2009), the purpose of a qualitative descriptive design is to fully describe the phenomena in a real-life situation and as it happens naturally because people`s perceptions cannot be studied using statistics. It is stated that a qualitative descriptive design refers to a more intensive investigation of a phenomenon and its deeper meaning, thus leading to a thick description of the participants' actions while attempting to understand these actions from the participants' worldview (De Vos et al., 2011).

In this study, a qualitative descriptive design was found suitable to bring up a detailed description and deeper meaning of the participants' perceptions and their attitudes about the implementation of the PMTCT programme. Furthermore, this design was well appropriate for this study as it allowed the researcher to comprehensively describe the care received by children/child at the healthcare facility and the role played by the mothers to protect their children/child from being infected by HIV.

3.5 POPULATION AND SAMPLING TECHNIQUE

3.5.1 Population

The population is defined as the entire group of persons that is of interest to the researcher and meets the criteria of the study (Brink, et al., 2012). In this study, the target population was divided into two categories. The first category which was population one comprised 39 professional nurses working in the selected healthcare facilities in the rural sub-district where the study was conducted and who met the inclusion criteria. Moreover, this population was viewed as a perfect fit for this study because of their critical role in being the implementers of the PMTCT programme for children exposed to HIV.

The second category, which was population two, consisted of 73 mothers of HIV-exposed children who were attending healthcare facilities in a rural sub-district during the period of the study. This population was drawn from two major CHCs in Mahikeng and Ditsobotla sub-districts where PMTCT services were available and provided to the mothers and their children.

Thus, this population was seen as a perfect fit because they would have had a first-hand experience regarding the PMTCT services provided to children exposed to HIV and the role they play to protect their children from contracting HIV.

3.5.2 Sampling technique

In this study, two out of five sub-districts were purposively selected as study sites and these are Mahikeng and Ditsobotla. The two CHCs from these two major districts were selected due to the high rate of 0.95% and 1.2% of child-positive PCR tests. In addition, the mother's post-natal visit, 6 days after delivery was reported to be worse (Massyn et al., 2020).

Similarly, the researcher used purposive sampling to select participants from the target population. Selecting participants that possess knowledge about the phenomenon is essential to obtain information-rich, and useful data (Green & Thorogood, 2018). Hence, all the participants that were selected to participate in this study had to meet the set inclusion criteria outlined below;

3.5.3 Inclusion criteria: population one (professional nurses)

- All professional nurses must speak English.
- All professional nurses must have been working in the selected study site for a minimum of three months prior to the date of data collection for this study.
- All professional nurses must have encountered mothers of children exposed to HIV.

3.5.4 Inclusion criteria: population two (mothers)

- All the participants must be 18 years and above and speak Setswana, and or English.
- Be a biological parent, guardian or adoptive parent of a child/children exposed to HIV.
- Had an encounter with a professional nurse at the healthcare facility for the care of a child exposed to HIV.

3.5.5 Exclusion criteria for population one & two

- Participants living with mental illness.
- A biological parent of a child/children exposed to HIV but not living with them as primary caregivers.

3.5.6 Sample size

It is a principle that qualitative research studies focus more on the quality of information obtained from the participants to gain insight into the phenomenon under investigation than focus on determining the size of a sample upfront (Burns & Grove, 2009). Fouché et al. (2021) reiterate that qualitative studies' emphasis is on quality data, gaining deeper meaning from the participants, thus the number of interviews conducted should be determined by data saturation, not the researcher. In this study, the researcher conducted the interviews for population one until the researcher was convinced that data saturation had been reached, hence the interviewing process was stopped at the 12th participant, and with population two interviews were conducted up to the 10th participant as there was no new information that was emerging. Instead, the participants' responses were becoming repetitive of what had been said by other participants in the previous interviews (Fouché et al., 2021).

3.6 RECRUITMENT OF PARTICIPANTS

An approval to conduct the study was obtained from the University of the Western Cape (UWC) (**Appendix 1**) and the Department of Health (DoH) in NW Province (**Appendix 2**). Thereafter, the researcher wrote to the facility managers of the selected healthcare facilities in the Mahikeng and Ditsobotla sub-districts requesting permission to access the healthcare facility for data collection purposes. Furthermore, detailed information about the study was emailed to the facility managers including the research ethics approval letters from UWC and the DoH in the NW Province. After the facility managers were satisfied with the relevant documents, permission to access the facility for data collection purposes was granted (**Appendix 3**) and the other facility granted permission telephonically.

After all the gatekeepers (UWC, DoH in NW province, facility managers) had permitted the researcher to access the facilities, the researcher established contact with a professional nurse in each healthcare facility to ask them to be a mediator, which they agreed to. The purpose of the mediators was to introduce the researcher to professional nurses and mothers in the facility, assist the researcher to arrange meetings with the participants, and recruitments and convey study information to the participants (particularly mothers) in their language, namely, Setswana.

The researcher, with the help of the mediator, arranged to meet with the participants on specific dates per population category to introduce the researcher to the potential participants. Furthermore, it was for the researcher to explain the aim and objectives of the study, what was expected from the participants, and how data collection would be done. The researcher also indicated the estimated time to conduct each interview with the participants based on the pilot study conducted including ethical considerations for the study. The information sheet (**Appendix 4**) written in English was distributed to the professional nurses and the information sheet (**Appendix 5**) written in English and Setswana was also distributed to the mothers.

In each selected healthcare facility, a secure box and forms that require a person to fill in his/her name, and contact number if interested to participate in the study, were left in the reception area, under the supervision of the mediator. The healthcare workers and mothers who agreed to participate in the study were then contacted telephonically by the researcher and mediator to negotiate an interview appointment date, time and venue that best suited the participants for data collection. In this case, all the participants (mothers) opted to meet at the healthcare facility during their attendance dates. Similarly, the healthcare workers also chose to have individual interviews conducted at their workplace. All the information agreed upon was detailed in the researcher's diary throughout the process.

3.7 PRETESTING DATA COLLECTION INSTRUMENT

The aim of conducting a pretest in qualitative research is to determine whether the relevant data can be gathered from the few numbers of participants selected to participate in the study, and they must possess the same characteristics as those of the main study (Burns & Grove, 2011; Botma et al., 2010). The other important aspect of a pretest is that it allows the researcher to test the data collection instrument and be able to modify, such as rephrasing ambiguous questions, probing and terminologies, before commencing the interviewing stage for the main study (De Vos et al., 2011). In addition, it assists the researcher to estimate the interviewing time, and also to detect the challenges that may surface during the main study when interviews are conducted (De Vos et al., 2011).

In this study, the interview schedule was pretested on four participants (two from each group of the population) who met the inclusion criteria and had the same characteristics as the ones for the main study, and gave informed consent (Majid, Othman, Mohamad, Lim & Yusof,

2017). Conducting a pretest helped the researcher to determine the suitability of the environment and venue to conduct the interviews and whether participants understood the questions posed to them. It further assisted the researcher to identify any shortcomings in the data collection process and make necessary adjustments. In addition, it helped the researcher to gauge the comfortability of the participants during the interview session.

Since the researcher does not speak Setswana, a professional nurse (research assistant) from the study site, but not providing PMTCT services at that time, was invited to conduct the interviews. She was familiar with conducting interviews as she had conducted individual interviews in her study for her Master's degree.

The results of the pretest showed that the participants understood the questions posed. However, some issues were identified with population two (mothers). It was noted that interviews with the mothers should be done after they are done with the consultation with the professional nurses instead of conducting the interview before that, as they tend to panic and worry that they may miss seeing the healthcare worker on time. Also, it was noted that even though the participants understood the questions, they were not comfortable speaking freely in front of the professional nurse, particularly about things that may be perceived as negative. The main reason was the fact that she worked at the facility, and she was still seen as an authorized personnel instead of a researcher. To mitigate these findings, a retired senior lecturer, from the department of nursing, was invited to conduct the individual interviews for the main study using the participants' home language. In addition, the interviews were conducted at the requested time.

3.8 DATA COLLECTION METHODS

Data collection for part two of phase one commenced in February 2019 and was completed in May 2019. In qualitative research, data are collected in the form of words and sentences (Barrett & Twycross, 2018). Often time, such data capture the participants' emotions, feelings, and perceptions of a particular phenomenon (Green & Thorogood, 2018). Hence, it is important for the researcher to first determine what kind of data are required to utilise the most appropriate data collection method. The chosen data collection method was guided by the research topic, question, and purpose of the study as well as the research design (Fouché et al., 2021).

3.8.1 Semi-structured individual interviews

In this study, semi-structured individual interviews were conducted with professional nurses (population one) and mothers (population two). Semi-structured interviews provide flexibility for both the researcher and participants in the sense that participants shared their information and perspectives easily, hence the researcher could ask follow-up questions on interesting issues that he/she did not think of (De Vos et al., 2011). This method of data collection was chosen because the researcher needed to obtain detailed and broader concerns about the participants' perceptions in a natural and relaxed environment. The researcher assumed that to design a viable intervention strategy to improve the implementation of the PMTCT programme, it is essential to ask the people (professional nurses) who provide the services and those that are meant to consume (mothers of HIV-exposed children) such services.

3.8.2 Data collection tool

The semi-structured individual interviews were conducted with professional nurses and mothers of children exposed to HIV. The interviews with professional nurses were guided by a set of broad predetermined questions (**Appendix 6**).

- What are your perceptions of PMTCT services offered in your workplace? Why do you hold such views?
- What is your understanding of PMTCT guidelines processes?
- How do you feel about the role you play in implementing the PMTCT guidelines?

In the interviews conducted with the mothers, the following broad predetermined questions (see **Appendix 7**) were posed:

- What are your perceptions about the care your child is receiving in the health care facility?
- What is your understanding of the PMTCT processes?
- What is the role that you play to prevent the spread of HIV infection to your child?

The research interview guide (**Appendix 7**) for mothers was drafted in English and then translated to Setswana (**Appendix 8**). A back translation was done by an independent person

competent in the language, to confirm that the document was not changed from its intent and purpose.

3.8.3 Data collection procedure

The researcher reminded each participant a day before about the set date, time, and venue for the individual interviews. The researcher arrived early at the health care facility to prepare the venue by organising chairs and a table, including putting the notice "do not disturb interview in progress" on the door, outside. The venue provided the needed privacy to conduct the study interviews and made it feasible to utilise the audio-recording device because there was no noise coming through into the venue. The venue did not have a telephone and the researcher's, and participants' cell phones were switched off or placed on silent while in the venue.

3.8.4 Interview procedure with professional nurses (population one)

Interviews with professional nurses were conducted in English. The researcher welcomed and greeted the participants. The participants were again reminded that participation was completely voluntary, and they could withdraw anytime, and there would be no penalty whatsoever for withdrawing from the study. The researcher explained the informed consent form, and the use of a code instead of a real name in the research documents as well as the potential risks and assistance available in place to deal with such risks if needed. The audio-recording device was also explained to each participant and taking of notes intermittently during the interviews.

The participant was then given the consent form (**Appendix 9**) with permission to sign after it had been explained. The statement that says *individual interviews would be audio recorded* was included in the informed consent. The researcher started the interview by first asking participants' characteristics information (**Appendix 6**). Then the interviews started as a social conversation to get the participants to relax and then it moved to a highly interactive stage as the predetermined questions were asked of the participant. During the interview sessions, multiple probing questions such as "Can you tell me more about that? What do you mean by that? Why do you say so?" were asked to obtain rich data from the participants (Levitt et al., 2018).

The individual interviews were conducted until the researcher was convinced that data saturation had been reached, hence by the 12th participant the interviewing process was stopped as there was no new information coming from the participants. Each interview lasted between 40 and 50 minutes.

3.8.5 Procedure with the mothers (population two)

The interviews for this population were conducted by a research assistant who is a seasoned researcher/ interviewer. The reason was that she spoke the home language of the participants which the researcher did not.

The research assistant commenced all the interviews by greeting the participants, introducing herself, and reminding the participants about their right to withdraw at any stage of the interview, confidentiality, anonymity as well as the potential risks and measures that were in place to deal with such risks should the need arise. The audio-recorder was explained to the participants, and partial taking of notes during the interview was explained to the participants. The consent form (**Appendix 10**) together with the permission to audio-record the interview was signed by the participants. The consent form (**Appendix 10**) for mothers was drafted in English and then translated to Setswana (**Appendix 11**). A back translation was done by an independent person competent in the language to confirm that the document was not changed from its intent and purpose.

The research assistant commenced the interview by first completing the participants' characteristics, and then started the interviews by asking the predetermined questions using an interview guide (**Appendix 7 & 8**). The interviewer used multiple probing questions to obtain in-depth information from the participants. The interview guide assisted the interviewer in properly facilitating the interview session without missing anything. Each interview lasted approximately 35-50 minutes, and all interviews were audio recorded. The research assistant stopped conducting interviews on participant 10 because there was no new information that was coming forth at this stage. Thus, she was of the view that data saturation had been reached. All participants were allowed to ask any question(s) they might have. The interviewer thanked all the participants for their patience and for agreeing to take part in the study.

3.8.6 Field notes

In addition to interviews, field notes were documented based on observations, detailing the things that were seen and what the researcher thought was happening. As much as it is important to take field notes, at times it can be difficult to do so during the course of the interview because the researcher should strive to keep the participant relaxed and connect with the participant by maintaining eye contact and responding with appropriate probing questions at all times (Fouché et al., 2021).

Therefore, the researcher made time immediately after the interview was ended to write a descriptive field note describing things (such as facial expressions of being happy, sadness, crying, emotional, shocked; voice tone; and other non-verbal clues such as sitting position) while they were still fresh in the researcher's mind. These notes helped to refresh the researcher's mind during data analysis (Polit & Beck, 2013; Fouché et al., 2021). The researcher kept a reflective field note diary as additional notes to the descriptive field notes.

3.9 DATA ANALYSIS

Multiple authors concur that the purpose of data analysis in qualitative studies is to bring order, and structure, discover underlying meaning and make sense of the volume of data collected (Polit & Beck, 2017; Brink et al., 2012; De Vos et al.,2011; Burns & Grove, 2009). In this study, massive text data were collected from the participants using semi-structured individual interviews which in turn needed to be transcribed, translated from Setswana to English, and organised in a meaningful manner.

To give qualitative data a structure and full meaning requires creativity because it does not progress in a linear manner instead it is an iterative process (Brink et al., 2012). Hence, De Vos et al. (2011) had already advised that researchers, when conducting qualitative analysis, should move in analytic circles rather than a fixed linear approach. The qualitative analysis intends to produce a detailed and systematic, rigorous, analytic coding process (Fouché et al., 2021).

In qualitative research, data analysis commences as the researcher collects data (Moser & Korstjens, 2018). In this study, the iterative process between data collection and data analysis

was done concurrently. The researcher started the analysis by taking field notes and analysing the tone of voice, non-verbal cues, mannerisms, and body postures of the participants. This process allowed the researcher to identify aspects that could be added in the subsequent interview to accumulate rich data and issues that are necessary to probe further.

Therefore, to organise and provide a meaningful and detailed description of the data collected in this study, the researcher employed a thematic analysis by Colaizzi`s (1978) seven steps methods of data analysis. In thematic analysis, themes are generated from iterative and interpretative analytical coding processes, and it remains a suitable method to reduce the data to a manageable unit by breaking it up and reconstructing it in a new fashion (Fouché et al., 2021). Thus, this study adopted this method of analysis to unravel and describe the participants' perceptions by identifying, analysing, and describing themes found in the data (Fouché et al., 2021). The seven steps methods of data analysis that were followed by this study are depicted in Figure 3.2 below.

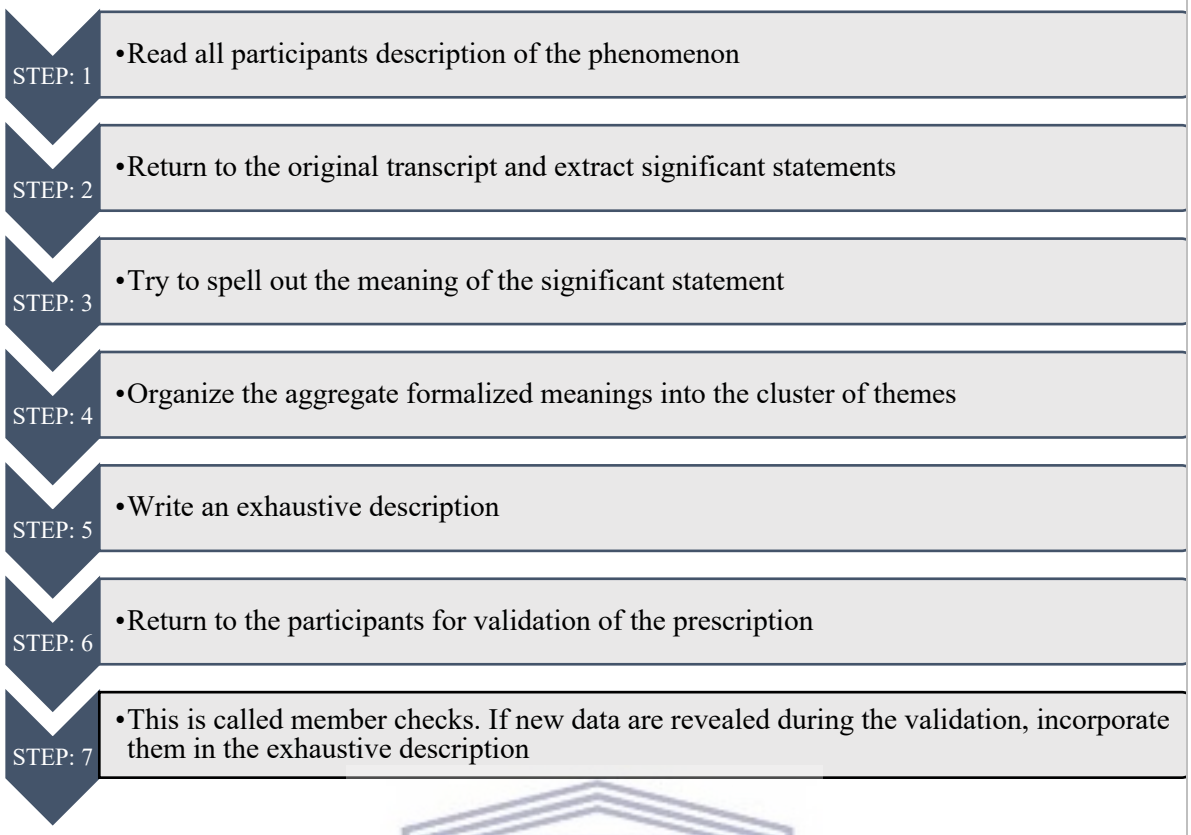

Figure 3-2: Colaizzi`s (1978) seven steps of data analysis as applied in this study

The section below explains in detail how Colaizzi`s seven steps of the data analysis process were applied in this study.

The ***first step*** of data analysis involved transcribing all the audio-recorded interviews sufficiently and verbatim. All transcripts were numbered chronologically, and real names were replaced with a code for all the interviews. Transcription was done as soon as possible after each interview to avoid missing relevant data. The researcher then carefully read and reread all transcripts one by one and line-by-line. The process of reading the transcripts multiple times was to familiarise the researcher with the data and become immersed in the data, as well as to get a complete sense of the collected data. During the transcribing stage, a substantial margin on the left side of the page was created to be used for coding.

The ***second step*** of data analysis involved the extraction of 'striking' phrases that describe the healthcare workers' and mothers' perceptions of the phenomenon under investigation. At this stage, the process of coding the transcribed data was performed. Each interview transcript was

read line-by-line and a relevant phrase in the text was highlighted in a particular colour. A code was allocated to each highlighted text to represent a meaningful unit.

The ***third step*** involved the formulation of the meaning of individual codes from significant statements which aided in the development of categories. An ongoing comparison between the formulated meaning and the original text was done to stay true to the description of participants' perceptions. At this stage, the codes that had similar colours were merged to create categories.

The ***fourth step*** involved the organisation of the created categories that emerged from all the similar codes that were merged from the previous step. These categories were grouped into an umbrella cluster of themes. At this stage, themes and sub-themes were then sorted, and organised in relation to the study objectives.

The ***fifth and sixth steps*** involved the writing of an in-depth and exhaustive description of the healthcare workers' and mothers' perceptions of the phenomenon under investigation, which is presented in chapter five as the results of this study.

In the ***seventh step***, the researcher returned the results to some of the participants for them to verify whether the meaning the researcher have given their words captured their perceptions. This exercise provided the opportunity to obtain clarification about any misinterpretation that could have been made by the researcher and served as a member check.

Detailed written field notes were used as the researcher's memory refresher during the data analysis process. A well-experienced independent coder in qualitative research was given the transcripts and field notes to do the coding independently, thereafter a discussion was held between the researcher and independent coder and a consensus was reached on the final themes and sub-themes of the study. This process was embarked on to strengthen the credibility of the study findings. The interpretation and conclusion statements made from phase one were then used to address objective five, in phase two of the study.

3.10 INFORMATION GATHERING AND SYNTHESIS [IR: D&D STEP 2]

This step consists of the following key activities, namely: using the existing information sources, studying similar interventions, and identifying functional elements of successful

interventions. To fulfil the activities in Step 2, the researcher performed a thorough desktop literature review and conducted an integrative review. The integrative review (in chapter four) gives a detailed functional characteristic identified from various interventions.

3.10.1 Integrative review design

For this study, the aim of conducting an integrative literature review was to explore the characteristics of different intervention strategies that are used to improve the implementation of health policies globally, particularly in rural areas. The integrative literature review design was chosen because of its uniqueness to allow the researchers to review and include studies with different methodologies (Whittemore & Knafl, 2005). In this study, the researcher applied the five stages of conducting an integrative review as described by Whittemore and Knafl (2005), namely: (1) problem identification, (2) literature search, (3) data evaluation, (4) data analysis, and (5) presentation of the findings' stage.

Various databases were searched using the search terms in an attempt to answer the following question: What are the characteristics described in the existing intervention strategies used to enhance the implementation of health policies in the PMTCT programme? The search included articles published in English from 2009 to 2019. The obtained articles were evaluated for methodological quality using relevant appraisal tools for qualitative and quantitative studies.

Thematic analysis was used to analyse data for all included studies in this review. The exploration of the characteristics included reading all studies multiple times to identify themes. A matrix was developed, and each study was then reduced to a page through the extraction of the needed information. The results were presented in a form of themes and drawn conclusions. A narrative presentation was made to describe the results (Whittermore & Knafl, 2005). A complete detailed process and findings of the integrative literature review are presented in Chapter 4 of this study.

3.11 DESIGN OF THE INTERVENTION STRATEGY [IR: D&D STEP 3]

As previously depicted in Table 3-1, this step addresses objective five of the study which was to design the intervention strategy to improve PMTCT programme implementation for HIV-exposed children in the rural sub-districts in North West Province.

The design step remains the most important step of the IR: D&D model and it cannot be done without covering the first two steps (problem analysis and project planning, as well as information gathering and synthesis) because they both allow the researcher to establish what problem requires an intervention, understand the effect of the problem, and identify the elements that are likely to be included to design an intervention strategy (Fouché et al., 2021).

The design step consists of two activities, namely: (1) designing a prototype of the intervention, and (2) designing the observational system, as previously shown in Table 3-1. Thus, in this study, the actual designing of an intervention strategy was done in this step.

For this study, the design commenced after all the information from Step 1 and Step 2 (empirical data and integrative literature review) had been synthesised. The domain of the designing intervention strategy was completed with the concluding statements from an integrative literature review and empirical data.

The other activity (design of the observation system) was not done by this study as the researcher was of the view that it would be most suitable when Steps 4-6 of the IR: D&D as shown in Figure 3-1 are to be executed to test the efficacy, acceptability, and relevance of the designed intervention strategy.

3.12 SCIENTIFIC RIGOUR

Qualitative studies are highly dependent on the rigour that has been applied throughout the research steps followed in a research project. Thus, Burns and Grove (2009) state that rigour requires a researcher to be disciplined, and adhere to details and meticulous accuracy in the research process, as this provides a high quality of the research findings. The researcher's openness to the procedures used in the research project help to enhance the trustworthiness of the research process. Trustworthiness of the quality of data collection and analysis is measured by four criteria, namely, credibility, dependability, confirmability, and transferability (Polit & Beck, 2012).

3.12.1 Credibility

The credibility of a study refers to confidence in the truth of data and interpretation thereof (Polit & Beck, 2012). To increase a high level of credibility in qualitative research, one can use

different strategies such as prolonged engagement, triangulation, member checking and debriefing (Fouché et al., 2021). In this study, prolonged engagement was ensured because the data were collected over a long period of time, and this assisted the researcher to gain a deeper understanding of participants' behaviour, values, and social relationships in their social contexts. The other strategy that ensured credibility was to triangulate the information gathering methods, with the use of method triangulation and data source triangulation. This study employed two different data collection methods, namely, semi-structured individual interviews, and integrative literature review.

Data source triangulation in this study was applied through the inclusion of different samples included at different phases of this study, namely professional nurses and mothers of children exposed to HIV. Furthermore, the researcher kept a comprehensive field note journal and a separate journal detailing data collected and analyses thereof. The persistent observation that was carried out in this study was to identify non-verbal expressions projected by the participants which cannot be captured by audio-recording. This was essential so that attention be given to them when analysing data and designing intervention strategies. Member checking was ensured by returning data transcriptions to the participants for them to verify that their views were represented accurately.

3.12.2 Dependability

Dependability refers to the stability of findings over time. Furthermore, dependability refers to whether the findings would be consistent if the study were to be repeated with the same participants or in a similar context (Brink et al., 2012). In a qualitative study, a research process ought to be logical, clearly documented, and audited (Fouché et al., 2021). In this study, the researcher kept an audit trail of the research process to enhance the dependability of the study. The continuous discussions of every stage of the research process of data collection and analysis with the supervisors, ensured critical scrutiny and thus strengthened dependability. In addition, independent verification of coding by an independent coder enhanced the dependability of the study. Furthermore, in this study, data collection and data analysis were run concurrently in order to identify aspects that could be added in the next interview to facilitate rich data. The interviewing process depended on data saturation instead of depending

on a specific number of participants stipulated by the researcher (Moser & Korstjens, 2018; Fouché et al., 2021).

3.12.3 Confirmability

Confirmability refers to whether other researchers can confirm the origins of the findings and further confirm that they would come to the same conclusion by following the same methods (Fouché et al., 2021). In this study, the audit trail was used to determine if the derived interpretation, findings, and conclusion could be traced to its source. Confirmability was further enhanced by making sure that the data represents the information provided by the participants, not the researcher's bias (Brink et al., 2012). This was done by having a peer debriefing with the participants and making use of a well-experienced independent coder to check whether the findings were consistent. Thus, Fouché et al. (2021) reiterate that researchers should pay attention towards their preconceptions, hence the need for continuous reflexivity. In this study, the researcher kept a self-reflective journal to acknowledge his presumptions and experiences throughout the research study.

3.12.4 Transferability

Transferability refers to the extent to which findings can be applied in another similar context (Polit & Beck, 2012). In this study, transferability was ensured by providing a detailed description of the participants' characteristics, research setting, and research methodology. Furthermore, this study employed multiple information-gathering methods to strengthen the study's usefulness in other settings. As indicated by Fouché et al. (2021) transferability means that the study's findings should be recognisable not only by other scholars in the field but by the context within which the study was conducted. To do so, quotes were used in the analysis that linked the findings to the context. In the current study, a thick description has been documented regarding the processes and steps that were applied in this research and the actual context of the study to allow a reader, who was not part of the study, to relate to the content and findings (Fouché et al.,2021).

3.13 DATA MANAGEMENT AND SAFETY

In this study, all collected raw data were stored on the University`s OneDrive. The storage of data in a university's server was to ensure that the data were highly secured and only accessible by using my university credentials anywhere should I need to access the data. This form of data storage allows data to be protected both when at rest and shared among the team if and when necessary. The data that were stored in the University`s OneDrive were in a form of a narrative in nature because the researcher collected data through conducting interviews with the participants. All interviews and group discussions were labelled, and names were not used on any documentation, instead, codes were allocated to ensure anonymity after it had been cleaned. To note is that data backing is done frequently.

The researcher also made use of cloud storage (Google Drive) to keep the encrypted research data files safe. To minimise the possible weak point, the researcher's laptop has a password-locked screen saver and timeout lock. The laptop software is kept up to date and the antivirus is updated accordingly.

3.14 ETHICAL CONSIDERATIONS

Ethics is described as a set of moral principles that are widely accepted and offer rules and behavioural expectations about the correct conduct towards the participants and the way of conducting the research (Fouché et al., 2021). It is, therefore, the responsibility of the researcher to conform to a code of these principles, and the rules of conduct at all times when conducting a research study to ensure the participants' protection (Arifin, 2018). The set of ethical principles that should guide the researcher`s ethical behaviour is discussed from 3.14.1 – 3.14.5 below.

The researcher obtained ethical clearance for the proposal from the Biomedical Research Ethics Committee of the University of the Western Cape (**Appendix 1**). The research project was also registered with the University of the Western Cape, project number: **BM18/6/29**. Additional permission was obtained from the facility managers. The researcher wrote to the facility managers of the selected healthcare facilities in the Mahikeng and Ditsobotla sub-districts requesting permission to access the healthcare facility for data collection purposes. Detailed information about the study was emailed to the facility managers including the

research approval letter from the University of the Western Cape and DoH in North West Province. After the facility managers were satisfied with the relevant documents, and the purpose of the study, permission to access the facility for data collection was granted. A study site in Mahikeng granted access in a written form (**Appendix 3**) and in Ditsobotla access was granted telephonically by a facility manager.

3.14.1 Informed consent

The participants were provided with an information sheet that had a detailed explanation of the study purpose, ethical considerations, and guidelines for participating in the study. All the information about the research study was shared in a language that participants preferred so that they could be fully informed and understand the content and have the ability to give consent to participate or decline participation (Polit & Beck, 2012; Fleming & Zegwaard, 2018).

Participants were asked to indicate their willingness to participate in the study by signing the informed consent form. In addition, participants were informed and requested to permit audio recording, and that statement was included in the informed consent form.

3.14.2 Anonymity and confidentiality

The researcher ensured that the information discussed with the participants was not identifiable even to the researcher himself. Hence, no participants' names were used during data collection. But instead, pseudo names were used where there was any real name/s mentioned during the data collection process (Hennink, Hutter & Bailey, 2011). The identification of the participants in the transcripts such as Interview 1, and Participant 1 were used.

To ensure confidentiality, the names of the specific clinics used are not and will not be mentioned, and the identity of the participants who participated in the study was only limited to the researcher and his team (Green & Thorogood, 2018). The researcher reiterated the importance of confidentiality in his research team. Also, audio-recording, transcripts were kept in digital storage with a coded password only known to the researcher. These files of data will be kept in the digital storage for the duration of five years in the event of any queries from the participants and then they will be deleted from the digital space.

3.14.3 Autonomy and right to withdraw from the research study

The participants were informed that they had a right to withdraw anytime from participating in the study. Complete information about the study was provided to all participants, wherein they decided on their own to take part in the study. They were further reassured that there would be no penalty posed against them regarding their work, and the services that are supposed to be provided to them were not going to be affected by their decision (Burns & Grove, 2009; Brink et al., 2012). The researcher never applies any sort of coercion to the participants, hence even a decision to use a senior lecturer to conduct interviews with mothers was also an attempt to eliminate the risk of coercion and possible feeling of intimidation.

3.14.4 Principle of justice

As indicated by Brink et al. (2012) participants have the right to fair and equal treatment before, during and after participating in the study. In this study, the researcher did not do any favours for any participant/s by including him/her in a research study. Furthermore, there was no discrimination in the selection of participants. However, participants were selected to participate in this research study because they met the study's inclusion criteria as outlined earlier. The researcher treated all the participants with care and integrity and made them comfortable during the entire study process. Furthermore, the use of an interpreter and including the participants who do not speak English was the researcher's effort to ensure justice.

3.14.5 Risk, beneficence, and non-maleficence

Even though there are always risks associated with research that involves the participation of humans, the researcher must ensure that benefits are balanced against the potential risks and harm. Furthermore, the principle of beneficence requires the researcher to focus on the attempt to do good to benefit the participants and community at large; whereas non-maleficence is an obligation not to harm whether intentionally or unintentionally. Therefore, the researcher needs to have a planned procedure to minimise any possible harm to participants (Fleming & Zegwaard, 2018; Fouché et al., 2021).

For this study, the researcher was aware that the questions may evoke feelings of distress, that is why for participants who could have experienced emotional distress, the arrangements were

made for them to be referred to a professional counsellor in the healthcare facility who was informed about this study before the commencement of data collection. This service was arranged to be available to the participants throughout the duration of the study.

Moreover, in this study, there were no monetary rewards offered for participation (Green & Thorogood, 2018), however, it was made clear that participation would benefit the larger community by sharing information that would help to design an intervention strategy to improve the implementation of the PMTCT programme and subsequently improve the lives of children. In addition, the participants were only given the reimbursement (R100.00) for their transport costs because it is fair practice, and no undue influence was placed on the participants as the reimbursement was given after participation (Fouché et al., 2021). Lastly, refreshments were provided because of the long time they had spent for individual interviews.

3.15 CHAPTER SUMMARY

This chapter provided a detailed methodology of the research. Exploratory qualitative descriptive research was used to collect empirical data [IR: D&D step 1], integrative review (more details presented in Chapter 4) was conducted to gather and synthesise existing information [IR: D&D step 2], and designing of the intervention strategy [IR: D&D step 3]. This study was conducted at two CHCs from Mahikeng and Ditsobotla sub-districts in the North West Province. Purposive sampling was employed to select the participants. Semi-structured interviews were conducted to gather data from the professional nurses and mothers of children exposed to HIV. The interview schedule was pretested with four participants (2 from each population group). Data were analysed using thematic analysis by Colaizzi`s (1978) seven steps' methods of data analysis.

CHAPTER FOUR

INTEGRATIVE LITERATURE REVIEW

4.1 INTRODUCTION

This chapter provides a detailed integrative literature review method as applied in this study and provides the rationale as to why it was best suited for this study compared to other types of review methods. Furthermore, this chapter explains the purpose of conducting an integrative review in this study. The objective covered by this integrative review, guided by the five stages of Whittemore and Knafl's (2005) framework, was to explore the characteristics of different intervention strategies used to improve the implementation of health policies globally and particularly in rural areas.

4.2 REVIEW METHODS AND THEIR USE

Generally, the aim of and contribution associated with reviews is to provide a synthesised overview of the current state of knowledge about a specific topic or question, describe research insights and existing gaps, resolve definitional ambiguities, and make recommendations that could be used by healthcare stakeholders to make decisions about a particular health issue or intervention (Palmatier, Houston, Hulland, 2018; Noble & Smith, 2018). There are four types of literature review methods commonly used namely, meta-analysis, systematic reviews, qualitative reviews, and integrative reviews. Each of these reviews has a different purpose, sampling frame and type of analysis (Whittemore & Knafl, 2005).

A meta-analysis research review combines the evidence of various primary studies through statistical analysis to determine the effect of an intervention (Burns & Grove, 2009). In order to do this, the research designs, hypotheses, and methods of these studies need to be identical (Whittemore & Knafl, 2005).

Meta-synthesis, meta-studies, formal grounded theory, and meta-ethnography all fall under the category of qualitative reviews and refer to review methods that synthesise the findings of qualitative studies on the phenomenon under investigation. These methods aim to synthesise qualitative findings into a new theory or overarching framework for the phenomenon under

study. Even though these methods differ in their approach to analysis and level of interpretation, they have the potential to broaden the generalisability of qualitative research findings (Whittemore & Knafl, 2005; Toronto & Remington, 2020).

Systematic research reviews combine the evidence of multiple studies to address a particular problem in practice, and this review method uses quantitative studies with a similar methodology particularly randomised control trials that are reviewed by the researcher to answer the research question. In systematic reviews, statistical and quasi-statistical approaches are often employed to combine studies (Botma et al., 2010; Burns & Grove, 2009).

In contrast, an integrative literature review is an approach that permits the inclusion of diverse methodologies such as experimental and non-experimental research. Its inclusion of both qualitative and quantitative studies at the same time allows the researcher to produce a much broader understanding of the subject under study and increase the scale of the conclusion reached, compared to other reviews (Torraco, 2005; Whittemore & Knafl, 2005).

4.3 INTEGRATIVE LITERATURE REVIEW METHOD

An integrative literature review is a research methodology that reviews, critiques, and synthesises mature and new literature on a topic in an integrated way such that new frameworks and perspectives on the topic are generated (Torraco, 2005; Souza et al., 2010). Various authors consider an integrative review to be the most "comprehensive methodological approach of the reviews" (Souza, Silver & Carvalho, 2010; Torraco, 2005; Whittemore & Knafl, 2005). According to Whittemore and Knafl (2005), the purpose of an integrative review is to define concepts, review theories, find evidence, and analyse methodological problems.

An integrative literature review methodology was, therefore, the most suited for this study to obtain as much comprehensive evidence from diverse studies as possible. Thus, other types of reviews were not suitable because they would have excluded a variety of studies from this review and fail to provide the researcher with a broader perspective on the phenomenon under study.

4.4 STAGES OF AN INTEGRATIVE LITERATURE REVIEW

The researcher adhered to the stages of the integrative literature review as described by Whittemore and Knafl, (2005), namely: (1) problem identification, (2) literature search, (3) data evaluation, (4) data analysis, and (5) presentation of findings.

4.4.1 Problem identification stage

The first critical stage of any review is to identify a clear problem that the study intends to address and the purpose of the review. A clearly defined review purpose assists the researcher in accurately operationalising variables and facilitates the extraction of the appropriate data from primary sources. Furthermore, having a clear purpose for the review is critical because it provides the researcher with focus and set boundaries for the integrative review process (Whittemore & Knafl, 2005).

The purpose of conducting an integrative literature review in this study was to address the fourth objective of this study which was to explore the characteristics of different strategies used to improve the implementation of health policies globally and particularly in rural areas.

After clearly stating the purpose of the study based on the identified research problem, a research question should be developed. It is critical to formulate a specific question of inquiry to distinguish between relevant and irrelevant information that would best answer the review question (Whittemore & Knafl, 2005). However, a research question can originate from various situations such as the interaction of a researcher with healthcare workers, and patients, and from the researcher`s observations (Botma et al., 2010).

In this study, the persistent mother-to-child transmission of HIV prompted the researcher to formulate the question for this integrative review. The PMTCT programme has been the key maternal and child health intervention used to curb MTCT for more than a decade (Nicol, Dudley & Bradshaw, 2016) and has yielded remarkable results to reduce MTCT since its inception in the early 2000s (Barron et al., 2013). However, the PMTCT programme continues to be faced with various challenges at different stages of its implementation hence MTCT persists (Goga et al., 2018; Suryavanshi et al., 2018; Fokam et al., 2019). Despite the progress made so far, elimination of MTCT has not been reached and children continue to contract HIV

through mother-to-child transmission, particularly in rural areas (Pellowski, Wedderburn, Stadler, Barnett, Stein, Myer & Zar, 2019). Poor, if not inadequate, implementation of policies guiding the PMTCT programme has been sighted as one of the contributing factors that impede success, particularly in rural areas.

Nonetheless, there has been a dedicated effort towards eliminating MTCT by coming up with different interventions that are intended to overcome the challenges in the PMTCT and make EMTCT achievable (Barker, Barron, Bhardwaj & Pillay, 2015; Aarons et al., 2016; Ngidi, Naidoo, Ncama, Luvuno & Mashamba-Thompson, 2017; Vrazo, Firth, Amzel, Sedillo, Ryan & Phelps, 2018). It is, therefore, the interest of the researcher to explore these existing intervention strategies to gain an understanding of their characteristics in order to assist in tailoring intervention strategies specific to a rural context.

It is the very background that prompted the researcher to ask the following review question: *What are the characteristics described in the existing intervention strategies used to improve the implementation of health policies in the PMTCT programme from 2009 to 2019?*

This review question was constructed using the population, intervention, comparison, and outcome (PICO) strategy as discussed by Welty, Hofstetter and Schulte (2012). However, in this study only P (population), I (Intervention), and O (Outcome), were used to construct the searches as no C (comparison) was done between the outcomes. The researcher looked for different characteristics and the settings where the intervention strategies were employed. Therefore, in this review, the characteristics refer to the components of the interventions, people that were implemented and/ or were involved in the intervention, challenges in the implementation process as well as the outcome of the intervention.

4.4.2 Literature search stage

Whittemore and Knafl (2005) reiterate that a well-defined literature search strategy remains critical in an integrative literature review process, not only to enhance the rigour of the review but also to prevent bias in the review process. An incomplete and biased search is likely to result in an inadequate database and potentially inaccurate results. During the literature search stage, a computerised search remains the most convenient, efficient and effective method. However, it is helpful to combine a computerised search with other search strategies such as

ancestry searching, journal hand searching, networking, and searching research registries to maximise the literature search (Whittemore & Knafl, 2005).

In this review, a comprehensive electronic search was conducted using the following databases: PubMed, Medline, EBSCOhost, Cumulative Index to Nursing and Allied Health (CINAHL), Cochrane Library, Sabinet, and Google Scholar. The search was limited to (inclusion criteria) empirical studies written in English, peer-reviewed publications published from 2009 to 2019 and full-text availability. There were no restrictions placed with regard to the study design or sample size. In cases where full texts were not available, a librarian was contacted at the University of the Western Cape and the University of Cape Town (UCT) to retrieve those articles. The Boolean 'OR' and 'AND' were applied separately and in combination with the search terms. Furthermore, medical subject headings (MeSH) were used to solicit more terms in the database vocabularies. The list of search terms used during the search process in this review is shown in Figure 4-1 below.

PMTCT OR Prevention of Mother-To-Child Transmission OR Preventative of mother-to-child transmission OR Mother-To-Child Transmission OR MTCT OR maternal-infant transmission OR mother-infant transmission OR Vertical transmission AND HIV OR Human Immunodeficiency Virus OR HIV infection OR HIV infections OR Acquired Immune Deficiency Syndrome OR Immune deficiency Syndrome OR AIDS OR AIDS Virus OR AIDS Viruses AND Child OR Children OR Infant OR Infants OR babies OR paediatric OR paediatric OR HIV-exposed infant OR HIV-exposed infants OR HIV-exposed children OR HIV-exposed babies AND Policy OR policies OR strategy OR strategies OR intervention OR PMTCT Policy implementation OR Implementation strategy for policy OR Intervention strategy for PMTCT AND Rural areas OR rural health OR rural population OR limited resource areas

Figure 4-1: List of search terms used in the title, abstract or text.

4.4.3 Descriptors for the search

The initial search yielded a total of 743 publications after using various combinations of search terms from different selected databases mentioned above. After the removal of duplicates, 268 articles were retained. Further exclusion of 174 articles was done after reading the titles and abstract. These (174) articles were excluded because they did not indicate that an intervention

pertaining to the PMTCT was covered. A total of 94 articles were retained and their full text was retrieved for more comprehensive screening against the inclusion criteria. Of the 94 articles retained, after reading their full text a further 87 articles were excluded. A final sample of seven articles was retained for the critical appraisal, coding, and analysis process.

In addition to an electronic search of the database, an ancestor searching strategy was conducted. This was done by locating cited studies in the reference list of other studies. The ancestry search provided three articles and was subjected to scrutiny against the inclusion criteria. After reading the full text, one article was excluded as it was a protocol at that stage. Subsequently, the final two articles were added to the initial seven articles that were retrieved from various databases; thus nine articles were retained as a final sample for analysis in this integrative review. The result of the search process is depicted in Figure 4-2 below.

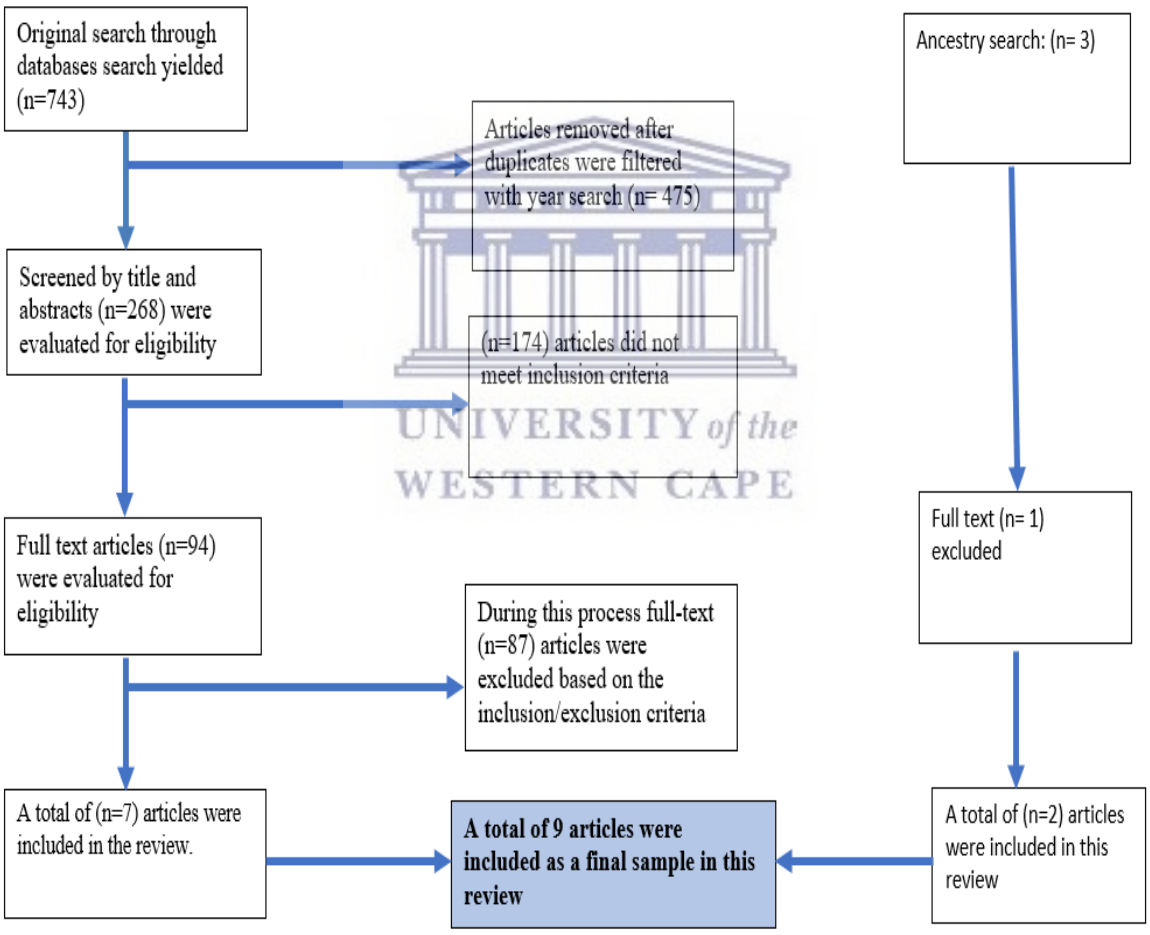

Figure 4-2: **Flowchart depicting selection process and final number of selected articles in this study** ***(Moher, Liberati & Tetzlaff, 2009)***

4.4.4 Inclusion and exclusion process

After stating the purpose of this review and formulating a clear review question, the researcher outlined the inclusion and exclusion criteria for this review. This was done to ensure that articles retrieved from the literature were in accordance with the set inclusion and exclusion criteria for this integrative review. A final sample of nine articles that were obtained from various databases mentioned above was subjected to a rigorous process by using the inclusion criteria. In this integrative literature review, articles were included if they focused on interventions, strategies, policies on PMTCT programme, HIV-exposed children, rural areas, globally, published between 2009 and 2019 and were written in English. The inclusion and exclusion criteria consultation meeting was held with the supervisors to check if these criteria were appropriately applied during the search process. At the end of the meeting, a consensus was reached on the nine included articles. Therefore, articles that did not meet the criteria for this review were excluded.

4.4.5 Data evaluation stage

According to Whittemore and Knalf (2005), there is no gold standard for evaluating and interpreting methodological quality. However, quality scores may be used to support interpretation (ibid). Thus, the researcher adopted two critical appraisal tools to appraise the rigour of included studies. During the process of this integrative review, the qualitative and quantitative studies fulfilled the stipulated criteria. Therefore, the qualitative studies were critically appraised using the qualitative assessment and review instrument (QARI) checklist (Pearson, 2004), (see Table 4-1) and quantitative studies were appraised using Bowling's (2009) checklist, (see Table 4-2). There are 10 and 20 questions for qualitative and quantitative studies respectively. The questions on the checklist tools used to appraise, included studies that required a "yes" or "no" answer. A "yes" response led to a score of 1 per question, and a "no" led to a score of zero. The qualitative studies had to meet 6-8 out of the ten items on the checklist to be included; whereas quantitative studies had to meet 11-17 out of the 20 items on the checklist to be included in this integrative review (Pitt, Powis, Levett-Jones & Hunter, 2012). After a critical appraisal was done for qualitative (n=3) and quantitative (n=6) studies, none of the studies were excluded. A complete summary of all nine research studies included in this integrative review is depicted in Table 4-3.

Table 4-1: The quality appraisal checklist tool for qualitative studies (Pearson, 2004)

Author and Year	DiCarlo et al. 2018	Doherty et al. 2009	Schuster et al. 2016
Criteria: Y (Yes) OR N (No)			
1. Is there congruity between the stated philosophical perspective and research methodology?	Yes	Yes	Yes
2. Is there congruity between methodology and research question or objective?	Yes	Yes	Yes
3. Is there congruity between methodology and methods used to collect data?	Yes	Yes	Yes
4. Is there congruity between methodology and representation and analysis of data?	Yes	Yes	Yes
5. Is there congruity between methodology and interpretation of results?	Yes	Yes	Yes
6. Is there a statement locating the researcher culturally or theoretically?	No	No	No
7. Is the influence of the researcher on the research, and vice-versa addressed?	Yes	Yes	No
8. Are participants and other voices adequately represented?	Yes	Yes	Yes
9. Is the research ethical according to current criteria, and evidence of ethical approval?	Yes	No	Yes
10. Are the conclusions drawn flow from analysis or interpretation of data?	Yes	Yes	Yes
Total score for each article	**9**	**8**	**8**

Table 4-2: The quality appraisal checklist tool for quantitative studies (Bowling, 2009)

Author and Year	Dillabaugh et al. 2012	Foster et al. 2014	Gamell et al. 2016	Herce et al. 2015	Odeny et al. 2019	Peltzer et al. 2017
Criteria: Y (Yes) OR N (No)						
1. Aims and objectives clearly stated	Yes	Yes	Yes	Yes	Yes	Yes
2. Hypothesis/research question clearly specified	Yes	Yes	Yes	Yes	Yes	Yes
3. Dependent and independent variables clearly stated	Yes	Yes	Yes	Yes	Yes	Yes
4. Variables adequately operationalised	Yes	Yes	Yes	Yes	Yes	Yes
5. Design adequately described	Yes	Yes	Yes	Yes	Yes	Yes
6. Method appropriate	Yes	Yes	Yes	Yes	Yes	Yes
7. Instrument used tested for reliability and validity	No	Yes	Yes	Yes	Yes	Yes
8. Sample, inclusion/exclusion and response rate described	Yes	Yes	Yes	Yes	Yes	Yes
9. Statistical errors discussed	Yes	Yes	Yes	Yes	Yes	Yes
10. Ethical considerations	Yes	Yes	Yes	Yes	Yes	Yes
11. Was the study piloted	No	Yes	Yes	No	Yes	Yes
12. Statistical analysis appropriate	Yes	Yes	Yes	Yes	Yes	Yes
13. Results reported and clear	Yes	Yes	Yes	Yes	Yes	Yes
14. Results reported related to hypothesis	Yes	Yes	Yes	Yes	Yes	Yes
15. Limitations reported	Yes	Yes	Yes	Yes	Yes	Yes
16. Conclusions do not go beyond the limit of data analysis	Yes	Yes	Yes	Yes	Yes	Yes

Author and Year	Dillabaugh et al. 2012	Foster et al. 2014	Gamell et al. 2016	Herce et al. 2015	Odeny et al. 2019	Peltzer et al. 2017
17. Findings able to be generalised	No	No	No	No	No	No
18. Implications discussed	Yes	Yes	Yes	Yes	Yes	Yes
19. Existing conflict of interest with the sponsor	No	No	No	No	Yes	No
20. Data available for scrutiny and re-analysis	No	Yes	Yes	No	Yes	Yes
Total score for each article	**15**	**18**	**18**	**16**	**19**	**18**

Table 4-3: Summary of all included studies in the integrative literature review (2009 – 2019)

Author and year	Country	Population and Sample	Aim	Design
DiCarlo et al. 2018	Kenya	10 health facilities. 15 Lay health workers and 170 HIV-positive women	To assess the experience and perceptions of lay health workers administering the interventions	Qualitative study
Dillabaugh et al. 2012	Kenya	119 health facilities, HIV-positive women and infants	To increase assessment of HAART eligibility, its uptake among HIV-positive women, improve testing for HIV-exposed infants and HAART uptake among HIV-positive infants	Prospective cohort study
Doherty et al. 2009	South Africa	18 PHC clinics, 15 facility managers interviews, 35 lay counsellors' interviews	To report on the results of a participatory quality intervention to improve the PMTCT programme in South Africa	Participatory research
Foster et al. 2014	Zimbabwe	30 rural health facilities in two districts. 150 HIV-positive women	To assess whether Mother Support Groups (MSGs) increase retention rates in the care of HIV-positive mothers and their exposed infants during the post-partum period and increase	Cluster randomised trial

Author and year	Country	Population and Sample	Aim	Design
			male involvement in the PMTCT programme	
Gamell et al. 2016	Tanzania	200 HIV-infected pregnant women; 547 HIV-infected children and HIV-exposed infants	To evaluate the clinical outcomes of children and pregnant women before and during the implementation of a bundle of measures to improve the quality of HIV care in rural Tanzania	Prospective cohort study
Herce et al. 2015	Malawi	5 health districts. HIV-positive women and HIV-negative women	To evaluate performance on PMTCT outcomes	Cross-sectional study
Odeny et al. 2019	Kenya	20 health facilities. HIV-positive women enrolled in the PMTCT programme	To evaluate the real-world effectiveness of the intervention for increasing rates of early infant diagnosis of HIV and increasing the proportion of HIV-positive pregnant women who remain in care	Cluster randomised trial
Peltzer et al. 2017	South Africa	699 HIV-infected pregnant women and infants from 12 community health centres	To test whether behavioural intervention delivered by lay health workers could increase PMTCT knowledge and reduce MTCT	Randomised Control Trial
Schuster et al. 2016	Mozambique	92 participants. Maternal and child health nurses, community healthcare workers, volunteers, and traditional birth attendants	To characterise the barriers and promoters to PMTCT of HIV service delivery and assess the appropriateness of performance-based incentives intervention and application to the PMTCT programme	Qualitative investigation

4.4.6 Data analysis stage

The purpose of the analysis stage in the integrative review was to synthesise the evidence through coding, categorisation, and summarisation of the primary sources into an unbiased integrated conclusion about the research problem (Whittemore & Knalf, 2005). Despite the fact that there are no definite data analysis methods for integrative review, primary research

methods of analysis such as qualitative research are applicable (Sandelowski, 2000; Whittemore & Knalf, 2005). In this review, thematic data analysis was employed for analysing and synthesising the findings of the included studies. Thematic analysis is a broadly used, flexible method, for identifying, analysing, and reporting patterns within the data. Moreover, this method of analysis was found suited for this review because it organises the main important themes or concepts across diverse sources of literature (Toronto & Remington, 2020).

According to Whittemore and Knalf (2005), it is imperative to ensure methodological rigour by employing a reliable and valid coding process in the integrative review. Therefore, in this review, the researcher became immersed in the data by reading and re-reading each article, and this was done to all included articles in this review. Line-by-line coding was done using words when a pattern of characteristics was identified across the studies. The included studies' results or findings' section were analysed inductively. Thereafter, inductive codes were grouped into clusters of categories. Finally, the categories were compared and collapsed to create themes and sub-themes which formed the basis of the findings. In addition, a table was used to display the data in order to examine the patterns, themes, commonalities, and differences across the review sample.

4.4.7 Presentation of findings stage

Table 4-4: Data analysis of included studies

Author and Year	Intervention	Finding/characteristics
DiCarlo et al. 2018	Multi-level combination intervention to improve retention among women living with HIV initiating the PMTCT services and their infants.	***Components of the intervention***: - Home visit to provide support on medication adherence, nutrition, and breastfeeding - SMS text and phone calls were used to remind clients of their upcoming appointments - Health education using PMTCT flip charts for mothers during both home and clinic visits
		People that implementing and or are involved in the intervention: - Lay health workers - Women living with HIV

Author and Year	Intervention	Finding/characteristics
		Challenges in the implementation: - Client concerns related to privacy (during a home visit and at the clinic), disclosure, and fear of being stigmatised - Lack of space (offices, consultation rooms) - Staff shortages, limited resources (test kits)
		The outcome of the intervention The overall intervention was found to be feasible, acceptable, and well received by clients. Phone calls and SMS text message reminders increased the communication between the clients and lay health workers and enabled clients to attend their appointments. The intervention was able to deliver mother and child health and ART education to mothers and support them in unique ways.
Dillabaugh et al. 2012	Rapid Results Initiative (RRI) intervention.	***Components of the intervention***: - Sample transport was increased, to daily or twice weekly - Access to cell stabiliser tubes was increased to allow daily blood drawing at peripheral sites - CD4 samples were flagged at the lab for prioritisation - Improved identification of HIV-exposed infants by offering to test women of unknown HIV status - Conducting same-day dried blood spot sampling for PCR testing for exposed infants - HIV-positive PCR was flagged at labs and immediately communicated by phone to facilities - Facility staff contacted parents by phone or sent a community health worker to notify parents - Staff were trained and empowered to rapidly initiate HAART on HIV-infected infants
		People implementing and or are involved in the intervention Facility staff, Community health workers, and women living with HIV
		Challenges in the implementation: Failure to return to the clinic for blood test results and HAART initiation Lack of HIV test kits and HAART services in the health facilities
		The outcome of the intervention

Author and Year	Intervention	Finding/characteristics
		There was a significant increase in women that were counselled and tested. However, post-RRI period women counselled and tested dropped CD4 testing increased and remained higher in the post-RRI period There was a significant improvement in CD4 test performed and HAART uptake in women living with HIV HIV PCR tests from HIV-exposed infants significantly increased Male partners HIV testing in the ANC improved during the RRI. However, the proportion of men tested for HIV decreased but was sustained at a 50% increase level in the post-RRI period
Doherty et al. 2009	Quality improvement intervention consisted of a participatory assessment phase, followed by a feedback and monitoring phase.	***Components of the intervention***: -Clinical staff trained on, PMTCT protocol, PCR testing, infant feeding counselling, and HIV counselling and testing - Strengthened supervision of PMTCT implementation services (managers assessed facility registers weekly)
		People implementing and or are involved in the intervention Professional nurses, lay counsellors, women living with HIV
		Challenges in the implementation: Shortages of staff Inadequate infrastructure in terms of counselling rooms Mother's fear of disclosing HIV status Poor data recording systems
		The outcome of the intervention CD4 testing of women living with HIV increased from 40% to 97%, maternal nevirapine from 57 to 96% and infant nevirapine from 15% to 68% An increase in 6 weeks of PCR testing from 24 to 68% was achieved
Foster et al. 2014	Mother Support Groups (MSGs) on retention in care in the PMTCT programme.	***Components of the intervention***: - Reducing inaccurate or incomplete data entry, monetary incentives were provided to healthcare workers responsible for data capture and management - Monetary incentives management processes were developed with the involvement of senior staff

Author and Year	Intervention	Finding/characteristics
		- Professional nurses from sites providing low-quality data received additional training to improve data quality - Procedures to manage referrals from one facility to another were established - SMS texts were sent to the MSG coordinator to non-attending patient-members of support groups by cell phone - Creating a space to hold MSGs meetings at the facility - Information was provided to mothers through teaching PMTCT topics - Community healthcare workers conducted home visits to antenatal and post-natal non-attenders
		People implementing and or are involved in the intervention Professional nurses and women living with HIV
		Challenges in the implementation: Lack of support from partners and or an in-law discouraging mothers to enrol in the MSGs Lack of space for MSG meetings was identified as a constraint, adding concerns around confidentiality and unintended disclosure Poor data quality of routine data collection
		The outcome of the intervention Increased retention in care of HIV-exposed infants at 12 months of age, and mothers living with HIV at 12 months post-partum
Gamell et al. 2016	Intervention package to improve PMTCT and paediatric HIV care.	***Components of the intervention***: - Increase early infant testing diagnosis to identify asymptomatic HIV-infected infants - Reduction in HIV PCR turnaround time to initiate treatment by using reliable transport to a referral laboratory - An electronic data collection system is used to minimise missing data and data capturing mistakes
		People implementing and or are involved in the intervention Professional nurses and women living with HIV
		Challenges in the implementation: Diagnosing children outside the PMTCT programme was a challenge

Author and Year	Intervention	Finding/characteristics
		Stock-out of kits to collect and store samples
		The outcome of the intervention The intervention resulted in an increased number of pregnant women and children diagnosed and linked to care Children diagnosed through the EID programme and transferred from other facilities increased significantly Sample collection and delivery of results to caregivers decreased to 13 and 35 days for positive and negative results Data capturing mistakes and missing data improved after the implementation of electronic records and the clinic became paperless
Herce et al. 2015	Safeguard the Family to strengthen the PMTCT services from ANC to post-delivery.	***Components of the intervention***: - Increase EID through staff training in DNA PCR testing, and HIV testing and counselling - Improve HIV PCR test results turnaround by having a reliable transport for sample collection - Lay counsellors training to strengthen couples` HIV testing and counselling
		People implementing and or are involved in the intervention Professional nurses, HIV pregnant women, and women living with HIV
		Challenges in the implementation: Prolonged results turnaround times and delayed first DNA PCR testing Shortages of staff delayed services
		The outcome of the intervention High uptake of HIV testing observed may be attributed to couples` HTC and male partner involvement during the ANC period An increase in the proportion of HIV-exposed infants receiving DNA PCR testing and early uptake of EID testing was observed HIV-exposed infants with complete documentation, first DNA PCR decreased significantly from 112 days to 76 days Pregnant women living with HIV that received nevirapine syrup for infant HIV prophylaxis had increased
		Components of the intervention:

Author and Year	Intervention	Finding/characteristics
Odeny et al. 2019	Text messaging intervention to improve early infant diagnosis.	- Increase uptake of infant HIV testing by sending an automated text message during pregnancy and after delivery - Phoning the clients - Training of health workers and other intervention implementers
		People implementing and or are involved in the intervention Lay cadre women living with HIV [Mentor mothers], Pregnant women living with HIV and Healthcare staff
		Challenges in the implementation: Maternal retention in the health care services was a major challenge
		The outcome of the intervention Increased uptake of HIV PCR testing and health staff`s knowledge Text messaging and phone call intervention was found to be efficacious for improving both infant HIV testing rates and maternal post-partum retention in the PMTCT programme
Peltzer et al. 2017	Behavioural intervention to enhance PMTC on mother-to-child transmission of HIV.	***Components of the intervention***: - Additional staff training on PMTCT services - Supervision of staff on PMTCT protocol implementation - Staff training on how to manage sensitive issues
		People implementing and or are involved in the intervention Lay health workers, women living with HIV
		Challenges in the implementation: Privacy and confidentiality concerns led to the mothers` fear to disclose their HIV status Lack of male involvement during pregnancy
		The outcome of the intervention Improved infant HIV status at six weeks and 12 months and ART adherence for mothers and infants, and PMTCT knowledge
Schuster et al. 2016	Performance-based incentives to improve the delivery of PMTCT services.	***Components of the intervention***: - Reduction of HIV PCR test results turnaround time - Staff training on PMTCT protocol to improve maternal and child health - Collaboration with other cadres to retain women in the PMTCT programme - Linkage of women living with HIV to clinical care, treatment adherence, infant feeding, and

Author and Year	Intervention	Finding/characteristics
		appointment follow-up by utilising community workers
		People implementing and or are involved in the intervention Nurses, Community health workers, and lay health workers
		Challenges in the implementation: Lack of office space (for meetings, storage, report writing), lack of privacy (child consultation conducted in air open hallway, lack of screen for women in the maternity ward) Poor record system High workload Stock-out Delays in obtaining patient results
		The outcome of the intervention Performance-based incentives based on social recognition that enable action on intrinsic motivation through training, supervision and collaboration had the most potential for improvement in record systems. There were concerns about the implementation of incentives which included neglect of non-incentivised tasks and distorted motivation among colleagues.

4.5 DEMOGRAPHIC INFORMATION OF THE STUDIES

A total of nine articles met the inclusion criteria and were all included in this review. This review included qualitative (3) and quantitative (6) studies. All included studies were carried out in rural areas. The countries associated with the articles in this review were Kenya (3), South Africa (2), Zimbabwe (2), Malawi (1), Mozambique (1) and Tanzania (1).

4.6 PRESENTATION OF THE MAIN FINDINGS

The themes and sub-themes that emerged from the analysis of the integrative literature review are contained in Table 4-5 below.

Table 4-5: Summary of the themes and sub-themes

Themes	Sub-themes
1. Component of the intervention strategy	Knowledge transfer
	Strategic management
	Fast-tracking as a strategy for improved clinical response
	Communication
2. People that implement or are involved in the intervention strategy	Healthcare workers
	Community health workers
	Lay counsellors
	Mothers living with HIV
3. Challenges in the implementation process of the intervention strategy	Inadequate infrastructure
	Limited resources
	Delayed reporting of CD4 count and PCR blood test results
	Lack of family support
4. Outcome of the intervention strategy	Increased uptake of HIV PCR, CD4 count testing and HAART uptake
	Increased communication, maternal retention, and blood results in turnaround time
	Improved couple HTC and family support
	Improved data capturing system

Four main themes emerged from the analysis of this review as depicted in Table 4-5. 1) Component of the intervention, 2) People that implemented or were involved in the intervention, 3) Challenges in the implementation process, and 4) Outcome of the intervention. These themes and their sub-themes emerged as the most influential intervention characteristics of successful strategy implementation.

4.6.1 Theme 1: component of the intervention

4.6.1.1 Sub-theme 1: knowledge transfer

In this review, knowledge transfer refers to the training of health staff such as nurses, lay counsellors, and community health workers. It also refers to teaching mothers of children exposed to HIV about PMTCT services. Out of the nine studies, knowledge transfer seemed to be a common characteristic with eight studies using some form of knowledge transfer strategy to increase uptake of whatever intervention. However, the majority of the studies showed that knowledge was transferred by conducting training of healthcare workers, community health

workers (CHW), lay counsellors and mothers living with HIV that are involved in healthcare provision.

Studies in this review (Dillabaugh et al., 2012; DiCarlo et al., 2018; Doherty, et al., 2009; Foster et al., 2014; Herce et al., 2015; Odeny et al., 2019; Peltzer et al., 2017; Schuster et al., 2016) reveal that staff training resulted in a significant ART medication uptake among pregnant women living with HIV. Furthermore, a high rate (85%) of infant HIV PCR testing and high (76%) maternal retention in the post-partum period was reported after training of frontline healthcare and CHW was conducted with the staff.

The review studies showed that after lay counsellors were trained, there was a significant improvement in the couples' HIV testing and counselling services provided to couples. Knowledge transfer through conducting training of mothers living with HIV remains crucial because they play a significant role in delivering a strategy. Thus, in this review studies showed that mentor mothers [lay cadre women living with HIV] at Phase 1 intervention were trained immediately after randomisation and at the end of training an evaluation of competence was conducted and each mentor mother was required to obtain a certificate of training by taking an online course following the two-day training.

Equally so, knowledge was also transferred to mothers of children exposed to HIV through teaching. Studies in this review revealed that information was provided to mothers by nurses and CHWs through teaching PMTCT topics such as infant feeding and the importance of medication adherence using PMTCT flip charts during home and clinic visits.

4.6.1.2 Sub-theme 2: strategic management

Another characteristic that was identified as key to strategy implementation was strategic management. Strategic management in this review refers to aspects such as staff supervision, performance incentives, data monitoring, and adequate infrastructure. Out of nine studies, strategic management was identified as the key characteristic to a successful strategy implementation with five studies using some key strategic management aspects during their strategy implementation.

The studies (Doherty et al., 2009; Foster et al., 2014; Gamell et al., 2016; Peltzer et al., 2017; Schuster et al., 2016) in this review showed that strengthened supervision of PMTCT

implementation services by assessing facility registers weekly, significantly improved the implementation process. It was also pointed out that to reduce inaccurate or incomplete data entry, monetary incentives were provided to health workers responsible for data capture and management, and the process of monetary incentives management was developed with the involvement of senior staff.

However, other studies in this review revealed that the implementation of an electronic data collection system was used to minimise missing data and data capturing mistakes. The review studies further showed that procedures to manage referrals from one facility to another were established through collaboration with other stakeholders to retain women living with HIV in care. It was also pointed out that creating adequate spaces to hold Mother Support Groups (MSGs) meetings, consultation, and counselling rooms at the health facility was a key component to successful strategy implementation. The studies reported that it is essential to strengthen human resources such as CHW to conduct home visits to antenatal and post-natal non-attenders to significantly improve strategy implementation.

4.6.1.3 Sub-theme 3: fast-tracking as a strategy for improved clinical response

The fast-tracking refers to different strategies used to ensure that the conducted clinical test example, CD4 count, and HIV PCR tests receive immediate attention, subsequently, quicker diagnosis and treatment. In this review, fast-tracking of blood test results was identified as a critical characteristic in four studies (Schuster et al., 2016; Herce et al., 2015; Gamell et al., 2016; Dillabaugh et al., 2012) using strategy to improve turnaround time. The fast-tracking strategies identified in the review studies included same-day dried blood spot sampling for PCR testing for exposed infants; flagging of CD4 count samples at the lab for testing prioritisation; and flagging of HIV-positive PCR at labs for immediate communication by phone to health facilities. It was also pointed out that after allocating a reliable transport for sample collection, the reduction in CD4 count and HIV PCR test results turnaround time improved significantly.

4.6.1.4 Sub-theme 4: communication

Out of the nine studies, communication with the clients through sending SMS texts and phoning the clients using their contact details as obtained from the records seemed to be a common

characteristic in five studies (DiCarlo et al., 2018; Dillabaugh et al., 2012; Foster et al., 2014; Odeny et al., 2019; Schuster et al., 2016) using one or both communication strategies.

The communication happened through sending SMS texts and phoning clients to either remind them about their upcoming appointment or to inform them about CD4 count and HIV PCR test results' availability. The review studies showed that facility staff contacted mothers by phoning them to alert them about the results or remind them about their upcoming clinic visits. In cases where mothers were not reached telephonically, CHWs were sent to notify mothers about the availability of the results in their homes as an additional communication strategy. Phone calls and SMSs were not only used to inform mothers about the results or remind them of their upcoming appointment but used to contact women that missed their clinic appointment and for early infant diagnosis.

The review further showed that non-attendance members of the Mother Support Group (MSG) were also contacted by cell phones to remind them about group meetings and reported to the health worker if they still failed to attend the MSG at the health facility. The studies revealed that continuous communication using SMSs and phoning clients improved both infant HIV testing rates, blood results turnaround time and maternal post-partum retention in care.

4.6.2 Theme 2: people that implement and or are involved in the intervention strategy

This theme refers to professional nurses, lay counsellors, community health workers and mothers living with HIV in the strategy implementation identified across the studies in this review. It seemed that the strategy implementation role was not solely executed by healthcare workers as it usually would happen. Therefore, identifying people that are involved in delivering the strategy and their roles is one of the characteristics that remain crucial to successful strategy implementation.

4.6.2.1 Sub-theme 1: professional nurses

The studies in this review showed that professional nurses were involved and executed various roles in the strategy implementation. Studies in this review revealed that serostatus disclosure, HIV PCR testing, HIV testing, counselling, phoning clients, and data capturing were delivered by healthcare workers.

4.6.2.2 Sub-theme 2: lay counsellors

The review studies showed that lay counsellors were involved in the strategy implementation and played a key role in providing counselling services to a sizeable number of clients. In this review, it was revealed that the availability of counsellors contributed to the high uptake of HIV testing and counselling (HTC).

4.6.2.3 Sub-theme 3: community health workers

The involvement of CHW was identified across the majority of studies. This review showed that some of the intervention strategies were administered by CHW, and it was revealed that CHW played a critical role in supporting mothers on safe infant feeding and treatment adherence, and across a range of behavioural, and social domains hence mothers were kept engaged in the PMTCT services.

4.6.2.4 Sub-theme 4: mothers living with HIV

A lay cadre of women living with HIV who had experience in the PMTCT programme was involved in delivering the TextIT intervention strategy. Furthermore, this review pointed out that Mother Support Groups (MSGs) intervention was led by a mother living with HIV who was appointed as a coordinator.

4.6.3 Theme 3: challenges in the implementation process

This theme emerged as a result of the challenges identified across the studies in this review and these challenges were strongly viewed as impediments to successful strategy implementation.

4.6.3.1 Sub-theme 1: inadequate infrastructure

Inadequate infrastructure refers to a lack of space and privacy, consultation rooms, counselling rooms and office spaces as a major challenge that was identified in five studies in this review (DiCarlo, et al., 2018; Doherty, et al., 2009; Foster, et al., 2018; Schuster, et al., 2016; Peltzer et al., 2017). The review studies showed that participants voiced out their concerns about fear of stigmatisation or being exposed as HIV positive at the clinic, and these fears were reinforced by lack of privacy at the clinic, sometimes due to carelessness of healthcare workers, and sometimes due to the physical set-up of the clinic rooms. The lack of space for mothers' support

group meetings in the clinic was mentioned as a serious challenge, adding to the concerns around privacy, confidentiality, and unintended disclosure.

Studies in this review revealed that the lack of counselling rooms, lack of office space, and staff sharing rooms were a challenge because mothers were scared to disclose their HIV status in the presence of other clients. Furthermore, this review showed that more than half (56%) of lay counsellors waited for a room to become available before they could counsel a client and that occurred daily. The challenge pertaining to privacy was not limited to the clinic, but it was also noted at the client`s homes.

The review showed that the most significant challenge for home visits was privacy. Home visits conducted by CHW to women who had not disclosed their status to their husbands, partners and or families were found extremely challenging. In some instances, CHW had to hide PMTCT flip charts that they were using to teach mothers in their homes because there was no privacy. It was revealed that even SMS texts and phone calls that were made to communicate with the mothers caused privacy concerns to participants who had not disclosed their status to their partners, especially where women and their partners share one phone.

4.6.3.2 Sub-theme 2: limited resources

Limited resources refer to shortages of staff, medication stock-out and HIV test kits which were reported as another major hindrance to strategy implementation by five studies (DiCarlo et al. 2018; Dillabaugh et al. 2012; Doherty et al. 2009; Gamell et al. 2016; Herce et al. 2015). The review studies reported that staff shortages led to long waiting times and delays in care. Furthermore, studies in this review pointed out that lack of human resources contributed to inadequate strategy implementation. It was also revealed that in other health facilities, there was no medicine such as nevirapine and HIV test kits, hence mothers ended up going back home without receiving the services despite having made several visits to the clinic.

4.6.3.3 Sub-theme 3: delayed reporting of CD4 count and HIV PCR blood test results

The studies in this review (Dillabaugh et al. 2012; Herce et al. 2015; Gamell et al. 2016; Odeny et al. 2019) point out that the blood test results turnaround time from the laboratory to the health facility and the client was a major challenge. Thus, failure to return to the health facility, and initiate HAART on time was noted and attributed to a prolonged results' turnaround time. This

review noted that the delay in receiving the test results contributes to other major problems such as late EID and loss to follow-up.

4.6.3.4 Sub-theme 4: lack of family support

Family support for mothers living with HIV was another challenge identified in this review (Dillabaugh et al. 2012; Doherty et al., 2009; Odeny et al., 2019; Foster et al., 2014; Peltzer et al., 2017). The review studies showed that mothers did not have family support because at times, they were discouraged by their in-laws to participate in the mothers' support groups established for women living with HIV. Studies further point out that lack of support from their partners during pregnancy and post-natal period contributed to a fear to disclose their HIV status, leading to poor treatment.

4.6.4 Theme 4: outcome of the intervention

4.6.4.1 Sub-theme 1: Increased uptake of HIV PCR, CD4 count testing and HAART uptake

Proper training of healthcare staff and all other stakeholders involved in the strategy implementation contributed to various PMTCT service improvements. There was a significant increase in the uptake of HIV PCR testing in HIV-exposed infants and health staff's knowledge. An increase in the CD4 count testing and HAART uptake in women living with HIV was achieved. There was a significant increase in women that were counselled and tested. An increase in 6 weeks of PCR testing from 24 to 68% was recorded. Furthermore, there was increased retention in care of HIV-exposed infants at 12 months of age, and mothers living with HIV at 12 months post-partum. Pregnant women living with HIV that received nevirapine syrup for infant HIV prophylaxis, increased.

4.6.4.2 Sub-theme 2: increased communication, maternal retention, and blood test results turnaround time

The communication through SMS text messages and phone calls increased the communication between the clients and health staff and amongst health staff respectively. There was a significant improvement in maternal retention and clients that returned to the health facility. Strategy outcomes showed an improvement pertaining to blood test turnaround time. A

communication strategy was able to increase maternal and child health service delivery and increased support to mothers in a unique way.

4.6.4.3 Sub-theme 3: improved couple HTC and family support

High uptake in couple HIV testing, and counselling improved. Male partner involvement during the ANC period and support received by pregnant mothers from their partners showed improvement. An increased rate in the mother's HIV status disclosure was noted. Family involvement and support received by mothers living with HIV showed improvement.

4.6.4.4 Sub-theme 4: improved data capturing system

Data capturing mistakes and missing data improved after the implementation of electronic records and the clinic became paperless. Performance-based incentives based on social recognition that enable action on intrinsic motivation through training, supervision and collaboration had the most potential for improvement in record systems. Regarding monetary incentives, there were concerns about the implementation of incentives which included neglect of non-incentivised tasks and distorted motivation among colleagues.

4.7 DISCUSSION OF THE RESULTS

As pointed out earlier, this review explored the characteristics of different intervention strategies used to improve the implementation of health policies globally and particularly in rural areas. Knowledge transfer, which happens through activities such as staff training on PMTCT protocols and educating mothers on PMTCT topics such as infant feeding and medication adherence, were identified as key drivers to a successful implementation of the strategy. Staff training should not involve nurses only, but it should include other stakeholders such as lay counsellors, CHWs, and mothers living with HIV. It is so because the proper implementation of any strategy requires nurses and all others that are involved in health provision to possess adequate knowledge and understanding of the protocols to implement the strategy consistently and effectively. The review studies revealed that staff training resulted in a significant ART uptake, infant nevirapine prophylaxis, infant HIV PCR testing, and maternal retention in the post-partum stage (Dillabaugh, et al., 2012; Doherty, et al., 2009; Herce, et al., 2015; Odeny, et al., 2019; Peltzer et al., 2017; Schuster et al., 2016).

Habedi (2021) and Jones et al. (2021) reiterate that sufficient time has to be allocated for training in order to equip professional nurses with information that can assist in the successful implementation of the PMTCT services. It is for that reason training of people involved in health provision should not be neglected if intervention strategies are to be implemented consistently and effectively. Previous research shows that training of health providers involved in PMTCT services led to a significant increase in the uptake of services and retention of mothers and their infants (Mgolozeli, Shilubane & Khoza, 2018; Sifunda et al., 2019).

Moreover, the fact that PMTCT guidelines are not static, but they are continuously evolving and updated time and again, shows that without continuous training of implementers, the intervention strategy is unlikely to be delivered consistently and successfully. This means professional nurses have to keep up with the task of updating and refreshing their minds on new developments in the PMTCT guidelines. In another study conducted by Mutabazi et al. (2020) on the integration of PMTCT into PHC, the authors reiterate that in order to implement the evolving guidelines, it is essential that all staff go through a process of training and retraining.

As it was revealed in this review, staff training was not limited to nurses but other people involved in the delivery of intervention strategies in the PMTCT such as CHW. The CHW play a crucial role in the implementation of the strategy in PMTCT services to execute their supportive role in the community during home visits and at the health facility. Thus, Mutabazi et al. (2020) report that some of the CHWs who did not have the required education to support the community members, had to receive continuous training. The seriousness to ensure that CHWs are trained so that strategies are delivered successfully, was found in the Zimbabwean government when they incorporated the PMTCT content in village health workers (VHW). This was necessitated by the fact that the VHWs mobilize communities for PMTCT services and encourage pregnant women to visit health facilities for services (Musarandega et al., 2020).

Another characteristic that was identified in this review was supervision and monitoring as well as staff support, hence it was referred to as strategic management. This characteristic is of importance because at times, professional nurses do not execute their tasks or follow protocols as they should despite having adequate knowledge. This practice opens a gap for inconsistencies and suboptimal provision of services. Therefore, it is imperative that there is

constant adequate supervision in place so that supervisors and managers are able to monitor whether the strategies are delivered accordingly or not.

The reviewed studies found that strengthened supervision of PMTCT implementation services by assessing facility registers weekly significantly improved the implementation process (Doherty et al., 2009; Foster et al., 2014; Gamell et al., 2016; Peltzer et al., 2017; Schuster et al., 2016). Mutabazi et al. (2020) report that CHWs, after receiving training, were supervised by the clinic nurse to ensure that the right information and quality services were delivered to the mothers. In the same vein, Mohamed et al. (2020) found that there is a great need for coordination to scale-up PMTCT uptake and maintain the quality of services.

It is apparent that supervision and monitoring of how services are delivered is equally important to also ensure that professional nurses have sufficient support. At times, strategies are not properly implemented because of the frustration experienced by healthcare providers due to the lack of support needed in order to execute their duties effectively. The support could include things such as the availability of drug-stock, and HIV test kits at all times, human resources, and adequate information on the new guidelines. In an intervention study conducted by Mohamed et al. (2020) on the feasibility and acceptability of implementing a point-of-care EID testing (Xpert HIV-1), the nurses revealed that the presence of additional staff made the implementation feasible at the study site, and further acknowledged that without the research nurses it would have been impossible to integrate a point-of-care EID into their existing workload.

Another critical characteristic that was identified was the fast-tracking strategies to ensure that clinical tests such as CD4 count, and HIV PCR blood test results received immediate attention, therefore immediate diagnosis, and patient management. The EID of HIV and timeous initiation of ART have been shown to reduce mortality among HIV-positive infants (Mofenson, Cohn & Sacks, 2020). Therefore, a fast turnaround time for blood test results is extremely important. There must be a deliberate collaboration and teamwork between the laboratory and health facility staff to maintain the speed at which the blood test results are processed and made available. Obtaining blood test results faster has an impact on the mother's motivation to return to the health facility for a final confirmatory test after stopping breastfeeding. In a study

conducted by Yee et al. (2020), it shows that mothers were promised to receive the dried blood spot in one and a half months, yet they ended up waiting for more than three months.

The other essential identified characteristic that was found as a key driver of a successful strategy is communication. The communication with clients happened through sending SMS texts, phoning clients, and in a form of conducting home visits. Continuous communication between staff to staff, and staff to the mothers during the implementation of a strategy is crucial in order to sustain quality care delivery. Hence, this review revealed that sending SMS texts and phoning the clients to remind them about their upcoming appointments and informing them about the availability of test results, assisted in improving the uptake of the strategy in the PMTCT service.

Previous research indicates that text messaging intervention was found to be efficacious for improving both infant HIV testing rates and maternal post-partum retention in the PMTCT programme (DiCarlo, et al., 2018; Dillabaugh, et al., 2012; Foster, et al., 2014; Odeny, et al., 2019). Another study conducted by Fairbanks et al. (2018) found that women attributed forgetfulness of taking medication and attending the clinic to various stressors during a post-partum period such as caring for a newborn. It is for such reasons that Mabachi et al. (2021) concur that SMS text messaging reminds the client to take ART medication on time because they get so busy with various chores and before they know it, the time to take medication is up. Therefore, the majority of the clients appreciated the text messages because it reminded them to be consistent with taking their medication.

As much as this form of communication has been found to increase the communication needed during the implementation of the strategy between the clients and staff and enable clients to prepare to attend their clinic appointments and take medication on time regularly, unfortunately, they are some clients that do not have cell phones. Thus, it is essential to involve other key people in the implementation of the strategy such as CHWs and mothers living with HIV, and family members to play a supporting role to women living with HIV including conducting home visits to deliver the necessary message from the healthcare workers.

The other important characteristic identified as having a critical influence on a successful strategy was people that implement and or are involved in the intervention strategy such as professional nurses, lay counsellors, CHWs and mothers living with HIV. Often time,

intervention strategies involve professional nurses implementing the strategy and that appears to be a limiting factor given the work required to be done diligently. Hence, this characteristic (involving key people in the health provision) was found to be significant in many ways when it comes to successfully implementing the strategy.

One of many ways is that staff shortages continue to exist particularly in rural health facilities (Winter, Schreyögg & Thiel, 2020; Habedi, et al., 2020; West, et al., 2021). Therefore, the involvement of multiple stakeholders assists in delivering a strategy efficiently and effectively. Moreover, in addition to nurses, people such as CHW and mothers living with HIV understand the *nuances* that exist in the community better thus their involvement in the intervention strategy is critical. It is clear that a successful implementation of the strategy is not a "one-man show" but it requires a concerted effort from all stakeholders for it to be successful.

Hence, in their intervention strategy implementation (Foster, et al., 2014; DiCarlo, et al., 2018; Peltzer, et al., 2017; Odeny, et al., 2019), professional nurses, community health workers, and mothers living with HIV were involved in delivering the strategy after extensive training. The involvement of CHW and mothers living with HIV is essential because sometimes clients find it easy to relate to another mother living with HIV. Consequently, it was found to be the case in DiCarlo et al. (2018) where CHWs' close relationship with their clients was attributed to their own HIV status disclosure and mutual recognition of shared experience. In addition, their involvement helped clients to disclose personal matters during home visits. It is in this regard their involvement in the strategy delivery is important, especially because some health facilities lack adequate space for privacy, for sensitive personal matters to be disclosed which is a serious challenge.

After identifying the characteristics that are key drivers to a successful strategy from the interventions which were found to be feasible, acceptable, and well received by clients, it was essential not to turn a blind eye to the challenges that were found as barriers during the strategy implementation. Understanding the challenges encountered by previous interventions, was extremely important in this review because when the researcher designed a new strategy, the measures to eliminate those challenges were well considered.

Inadequate infrastructure refers to a lack of space in the health facility and it was reported as a major challenge by multiple studies in the implementation of the strategy (DiCarlo, et al., 2018; Doherty, et al., 2009; Foster, et al., 2018; Schuster, et al., 2016).

Lack of space particularly in rural health facilities is a concern not only to the client's privacy and confidentiality but also to the health providers. Health facilities must create enough spaces for health providers which would bring necessary privacy needed to address clients' personal and sensitive matters. Even though previous intervention strategies are efficient in the midst of such a challenge, things cannot continue as is especially if a target to achieve zero new HIV infections in children is to be realised. Lack of space does not just affect clients' privacy but also delays care because patients have to wait longer to get services.

In a study conducted by DiCarlo et al. (2018) CHW did not have office space, so they had to borrow space in a comprehensive clinic and at times they had to wait for a long time because the room was occupied. The lack of space and delays forced them (CHW) to talk to their clients under a tree. Other studies also found that lack of space continues to be a serious constraint because it increases clients' waiting time to get services, who end up leaving without being offered services (Marwa, et al., 2020; Heerden, et al., 2021; Drysdale, et al., 2021).

Clients ought to disclose their HIV status and other sensitive matters without fear that their matters would be known by everyone, especially in the context of crowded clinical spaces. Previous research has shown that confidentiality issues related to HIV remain a major challenge within the overcrowded and limited resourced health system (Kagiso, et al., 2020; Berlacher, et al., 2021; Nkhonjera, Suwedi-Kapesa, Kumwenda & Nyondo-Mipando, 2021; Pillay, 2021).

Limited resources in the health facilities were another challenge reported by the review studies. In this case, limited resources mostly referred to a shortage of staff, and a stock-out of ART and HIV test kits. It seems that lack of resources has a serious negative impact when it comes to strategy implementation; it reverses the gains made to curb the MTCT of HIV. In a study conducted by Habedi (2020) and Mohamed et al. (2020), there was a shortage of ARVs that were requested from neighbouring clinics. In addition, staff shortages, including psychologists and counsellors, were found to be a serious hindrance to access and availability of PMTCT services. The healthcare staff sometimes find themselves providing mothers with fewer drugs

and shorter drug refill intervals in an attempt to cope with stock-outs in the health facility (King et al., 2020).

The delay in receiving HIV PCR blood test results was another challenge pointed out by various studies (Dillabaugh et al. 2012; Herce et al. 2015; Gamell et al. 2016; Odeny et al. 2019). The lack of quick turnaround time for blood test results remains a serious concern because it opens up the gap for 'lost to follow-up' without even finding out the infant's HIV status. As a result of the prolonged turnaround time for blood test results, mothers end up going back home without receiving their infant's results. Studies conducted by Ajemu and Desta (2020); Ngadu et al. (2020) found that mothers were frustrated by not knowing their infant's HIV status much earlier; however, they were appreciative to finally receiving the results after six months.

The fight to win the elimination of MTCT would not happen without family involvement and partner support. Thus, in this review, lack of family support was identified as a challenge that contributes to poor EID and initiation treatment timeously, mother's failure to disclose their HIV status, getting lost to follow-up, and non-adherence to medication among others (Peltzer et al., 2017 Odeny et al., 2019).

Studies conducted by Lusaka and Crowley (2021); Ogueji and Omotoso (2021) show that mothers feared abandonment if they disclosed their HIV status to their partners and another pair of mothers reported that their partners refused to test and did not support them at all. The only support they got was from the nurses and doctors. It is clear that there is still a need to educate family members to understand the importance of providing adequate support to mothers living with HIV and their children.

The outcome of the intervention strategies in this review showed a significant increase in the majority of maternal and child health care services that were implemented by these interventions, despite the challenges pointed out as impediments. The following aspect was noted in the outcome of the interventions: There was an increase in the infant HIV PCR testing and maternal retention in care during ANC and after delivery, and an improved CD4 count testing and HAART uptake for women living with HIV. Family involvement was also noted and some improvement in the couples' HIV testing during the ANC period. The blood test results turnaround time showed some improvement. However, the complexities involved to sustain the strategy were acknowledged. A significant improvement in communication

between healthcare staff and mothers, hence an increase in the PMTCT uptake was recorded. The data management system showed improvement after training and supervision of staff and the use of electronic data systems (DiCarlo et al., 2018; Dillabaugh et al., 2012; Doherty et al., 2009; Foster et al., 2014; Gamell et al., 2016; Herce et al., 2015; Odeny et al., 2019; Peltzer et al., 2017; Schuster et al., 2016).

4.8 CONCLUSION

The effect of training professional nurses and other stakeholders involved in the strategy implementation remains a serious key driver to achieving consistent and adequate strategy implementation. Then once adequate training has been obtained, there must be sufficient support such as human resources (adequate professional nurses, CHW, lay counsellors, psychologists), consumables (nevirapine, ARVs, and HIV PCR test kits) and proper functioning equipment. Fast-tracking strategies such as dedicated transport to collect blood specimen from the health facility to deliver them in the laboratory and flagging those key tests for immediate attention is extremely important. The use of SMSs and phone calls between the health facility staff and laboratory staff must be strengthened and maintained as functional as possible. Innovative methods to process the blood test and upload the results electronically so that clinical staff could access them timeously, is crucial. Health facilities should be encouraged to utilise electronic data record systems to avoid missing data and incomplete data capturing. Once supportive measures are well put in place, constant supervision and monitoring should be conducted regularly.

Task shifting is unavoidable to implement a strategy successfully. Therefore, the involvement of CHW, lay counsellors, and mothers of children exposed to HIV in the intervention is necessary. The linkage between clinical staff and CHW needs to be strengthened to notice mothers that are no longer returning to the health facility especially after failing to respond to SMS text messages or phone calls. It is essential that CHW continue to educate mothers on PMTCT protocols and clearly explain to them the importance of taking medication and breastfeeding and attending their children's appointments. Mothers of HIV-exposed children should be properly counselled and encouraged to disclose their status to their partners and or family members. CHW should clearly explain to family members the importance of providing

support to mothers living with HIV after disclosure. Similarly, male partners of mothers living with HIV should be encouraged to support their partners and participate in couple testing.

There should be an innovative method in place to create proper space in the health facility to hold support groups for mothers living with HIV, counselling rooms and consultation rooms to increase the uptake of the PMTCT services, thus enhancing the implementation of the PMTCT programme.

4.9 CHAPTER SUMMARY

This chapter presented the results of the integrative literature review. The results were analysed based on objective one which was to explore the characteristics of different intervention strategies used to improve the implementation of health policies. A total of nine studies were analysed in this review. The review findings were discussed in this chapter and were categorised according to the characteristics that were found to be key drivers for successful strategy implementation and challenges that were reported as barriers to the implementation of the strategy.

CHAPTER FIVE

PRESENTATION OF THE RESULTS AND DISCUSSION OF PHASE ONE

5.1 INTRODUCTION

This chapter presents the results of the analysed data of all the participants pertaining to Objectives 2, 3, and 4 which addressed data from the professional nurses (Objective 2) and mothers of children exposed to HIV (Objectives 3 and 4). Two populations were used to gather empirical data for this study. Population one consisted of the professional nurses and population two were the caregivers who, in this case, ended up being biological mothers. Therefore, this chapter is organised into two main sections. Section one presents the analysed results of the semi-structured interviews conducted with professional nurses. Section two presents the analysed results of the semi-structured interviews with biological mothers of children exposed to HIV.

SECTION ONE: RESULTS AND DISCUSSION ABOUT PROFESSIONAL NURSES POPULATION

5.2 DEMOGRAPHIC INFORMATION OF HEALTHCARE WORKERS

The first population was professional nurses providing PMTCT services at the healthcare facilities in rural areas in the North West Province. A total of 12 professional nurses (all females) participated in the semi-structured interviews. The participants' ages ranged from 25 to 55 years. The participants had been providing the PMTCT services to mothers and children exposed to HIV for more than three months which was the main inclusion criteria to participate in this study.

5.3 PRESENTATION OF THE FINDINGS FROM PROFESSIONAL NURSES

Three main themes emerged from the analysis of the collected data. All themes emerged under Objective 1, and each theme was then divided into sub-themes. To provide the reader with a complete understanding of the findings' context from the professional nurses, each theme and sub-themes are presented followed by a narrated explanation of the participants' responses.

Participants shared their perceptions and attitudes in the implementation of the PMTCT programme pertaining to children exposed to HIV as summarised in Table 5-1 below:

Table 5-1: Theme and sub-themes from professional nurses

Objective	Themes	Sub-themes
1. To explore the professional nurses' perceptions and attitudes on the PMTCT policy implementation pertaining to HIV-exposed children	**1**. Professional nurses' knowledge regarding the implementation of the PMTCT programme	• Professional nurses' training in the PMTCT programme
	2. Lack of human resources and consumable resources	• Shortages of staff • HIV test kits stock-out
	3. Challenges in the implementation of the PMTCT programme	• Delayed PCR birth test results
		• Tracking of mothers and their children
		• Mothers' non-disclosure of HIV status

5.3.1 Theme 1: Professional nurses' knowledge regarding the implementation of the PMTCT programme

The participants understood that PMTCT guidelines serve as the key framework for the management of children exposed to HIV including their mothers. Furthermore, participants viewed the PMTCT guidelines as a relevant tool because it guides them to correctly initiate prophylaxis and treatment for both baby and mother. The training was confirmed to be important, particularly in the evolving guidelines such as PMTCT guidelines. However, the involvement of professional nurses in planning and decision-making pertaining to the improvement of the PMTCT implementation is critical. In addition, participants pointed out that guideline protocols serve as an essential health information resource which they use as a point of reference to provide care. Hence, the availability of the latest updated PMTCT guidelines should be made available in all facilities timeously in the rural areas.

5.3.1.1 Sub-theme 1: Professional nurses' training in the PMTCT guidelines

Providing appropriate care to children exposed to HIV requires all professional nurses involved in the provision of care to be well versed and knowledgeable with the latest PMTCT guidelines. In this study, professional nurses informed the researcher that even though they are knowledgeable and can diagnose cases among children who come to their facilities, there are things that they do not have sufficient knowledge of, especially when it comes to practically implementing the management of the policy. Participants expressed this, *"…in theory, we are all knowledgeable about HIV, but sometimes management is a different story… Not to mention the children, wives, and husbands…" (P5).*

Professional nurses admitted that having a limited understanding of the interpretation of the results has the potential to compromise the care of children exposed to HIV, especially in the rural setting where doctors are not always available to intervene when needed. The participants had this to say: *"Eish, sometimes you don't know what to make of the results" (P2).* Decision making when dealing with children exposed to HIV is crucial. Participants admitted to having found themselves in a position where they have to handle indeterminant results which requires a multidisciplinary approach from various clinicians in a manner that is often not possible in rural facilities. This is what was expressed: "*…sometimes you do not know what to do but a decisive action is still required to effectively implement the management for the control of the HIV in children" (P7).* Implementing guidelines that are constantly evolving requires continuous in-service training so that professional nurses stay abreast with how to appropriately implement the guidelines and manage the children including their mothers.

Moreover, training empowers professional nurses not only to provide adequate care but to also provide mothers with relevant information that is key to the prevention of MTCT of HIV. Notably, guidelines that are needed to be used as a point of reference are not always there as the participants put it this way: *"At times we struggle with guidelines outlining the provision of antiretroviral treatment for HIV positive mothers or prophylaxis for infants" (P3).* This is alarming as the updated guidelines offer additional protection against vertical transmission through infant feeding. The professional nurses, therefore, need continuous in-service training to empower themselves and their mothers especially when mothers have to continue with childcare at home.

As much as training and continuous in-service training of professional nurses are essential, the involvement of professional nurses in planning and decision making of measures to be taken to improve the implementation of the PMTCT services is of utmost importance to change their attitude towards the implementation of the PMTCT services and foster accountability. This is what was expressed "*we are tired of people coming from Cape Town and Jo'burg (Johannesburg) to tell us what to do …yet they don't know how things work here" (P10).*

5.3.2 Theme 2: lack of human resources and consumable resources

Healthcare facilities are expected to have an adequate number of professional nurses in order to provide quality services to both mothers and children. This theme emerged from the analysis as a result of the concerns expressed by the participants in this study, pertaining to an inadequate number of professional nurses and the effect it has on the implementation of the PMTCT services.

5.3.2.1 Sub-theme 1: Shortages of staff

The participants were very vocal about the challenges caused by not having enough staff in their workplace. Participants agreed that consistent implementation of the PMTCT is critical in managing children exposed to HIV. However, at the same time, they pointed out that because of the work that one person has to do, it becomes a serious challenge to provide care to children consistently exposed to HIV because of work overload. The professional nurses' perceptions of the PMTCT implementation pertaining to children exposed to HIV were that: "*We are overwhelmed by the workload because they are few of us… (P1)"; "The most important thing that we need is adequate staff" (P9).* Participants agreed that having adequate staff would afford them sufficient time to also oversee that the guidelines are implemented accordingly.

Participants went further to inform the researcher that even when they complain to the management about work overload, which compromises the implementation of the PMTCT services, the management seemed to put the image of the institution first over the staff needs as one participant expressed herself in the following manner: *"I'm often reminded that I work for the 'best-resourced' national health system in Africa" (P4).* Despite the discouraging comment, participants revealed that many times they had to sacrifice their tea break and lunch time to ensure that services are delivered. Thus, they admitted that they do not have time to

check whether PMTCT services are adequately implemented or not as per the guidelines. This is what was said: *"…Where do I find the time to see that things are done properly?" (P10).* The challenge of shortage of staff, especially in the rural setting, has a multi-faceted adverse effect concerning proper implementation of the PMTCT services.

5.3.2.2 Sub-theme 2: Shortages of HIV test kits

Another challenge that was found to be compromising implementation of the PMTCT services was not having enough HIV test kits due to stock-outs. This is what was said: *"…HIV test kits should be available on a 24-hour basis at all facilities with a maternity service in the rural areas" (P12).* Sadly, the researcher was informed by the participants that blood collection samples is not always done because of test kits stock-out. The lack of these resources in rural facilities remain a major contributor to various challenges in the implementation of the PMTCT programme.

5.3.3 Theme 3: challenges in the implementation of the PMTCT programme

This theme presents the challenges on the PMTCT programme implementation in the rural healthcare facilities in the North West Province. The following five sub-themes presented below depict the perceived challenges as expressed by the participants in this study.

5.3.3.1 Sub-theme 1: Delayed PCR birth test results

Participants revealed that they are committed to providing quality care to children exposed to HIV by implementing the PMTCT guidelines accordingly; but they also admitted that receiving PCR test results within a short space of time from the laboratory remains a serious challenge. They said *"…it is not always possible to obtain a PCR test results timeously from the laboratory" (P6).* Participants admitted that not obtaining PCR results on time compromises the effectiveness of the PMTCT in managing children exposed to HIV. Furthermore, participants voiced out that they believe that they do their best to implement the guidelines in order to protect children from contracting the virus and to initiate treatment as early as possible where needed, but fail to obtain the results after phoning the laboratory frustrates and demoralises them. One participant expressed this: *"Sometimes when I asks the lab for the results, and they tell me that results are not available I find myself getting angry and shouting in front of a mother" (P11).*

5.3.3.2 Sub-theme 2: Tracking of mothers and their children

Tracking emerged as one of the leading challenges in the supervision of infant HIV management in this study. Tracking refers to phoning the mothers of children exposed to HIV using their contact details to remind them about their clinic appointments and to inform them about the availability of test results for their children. Participants revealed that lack of sufficient resources to do tracking impedes the intended outcome and they believe that a lot more can be done to increase the number of infants receiving PMTCT services and to keep them in the programme. In addition, professional nurses admitted that the tracking methods have a potential to retain mothers and their children in care given that they are applied effectively. The participants hastened to point out this: *"...the challenge is that we do not have phone allowances earmarked for making official calls to follow up on mothers and their children" (P8).*

The participants further shared that lack of human resources and work overload contribute immensely to the challenge of poor tracking and this is what was expressed "…we *lack staff numbers to undertake tracking for mothers because the staff that is available don't have time to make numerous phone calls because we have to make sure that ART section, medical and voluntary counselling and testing services are done" (P1).*

It was at this stage that the participants shared with the researcher that the idea of having additional staff members such as community health workers to intensify the tracking of mothers would make a significant improvement in the implementation of the PMTCT services and retain children in care. They pointed out that: *"...they* [facility management] *must get community health workers to assist us to follow up mothers and their children ...that's what is needed right now to manage this challenge" (P10).*

5.3.3.3 Sub-theme 3: Mothers' non-disclosure of HIV status

Healthcare workers admitted that implementation of the PMTCT services sometimes is hindered by non-disclosure of the mother's HIV status. Participants believed that disclosure of the HIV status would benefit children exposed to HIV to receive necessary PMTCT services timeously. However, participants revealed that often time, mothers are scared to disclose their status to families and their partners and that hinders the implementation of the PMTCT

guidelines. This is what they said: "…i*t is frustrating that even though diagnostic skills have improved tremendously, disclosure is still a challenge since mothers of infants exposed to HIV do not notify their partners about their status" (P5);* participants further pointed out that *"... mothers are afraid to inform their families and husbands about their HIV status" (P12).*

Participants pointed out that their engagement with mothers living with HIV has revealed that at times mothers do not disclose their status because they fear breakups and rejection particularly from their partners. This is what was expressed: "*... divorce and break-ups in romantic relationships are not uncommon once a partner's HIV status is revealed" (P8).* Another participant shared the mother's reason for non-disclosure to her partner as follows: *"I have someone new in my life and I do not want to scare him off*" *(P3)*. In this view, participants agreed that mother's non-disclosure of HIV status remains a serious challenge that possibly leads to non-compliance to treatment. This is what one participant said: "…another *big contributor to the failure of the PMTCT is poor patient compliance in ART treatment" (P6).* It appears that mothers do not adhere to treatment as they should, and this remains a challenge particularly to MTCT of HIV during the post-natal period.

5.4 DISCUSSION OF THE MAIN FINDINGS FROM PROFESSIONA NURSES WITH LITERATURE CONTROL

This section discusses the results from the professional nurses in line with the research objectives of the study. The study findings revealed relevant information on the professional nurses' perceptions and attitude pertaining to HIV-exposed children in rural healthcare facilities. The aspects that are discussed in this section will cover the main three themes and sub-themes that emerged from the analysis, conclusion, and chapter summary.

5.4.1 Professional nurses' knowledge in the implementation of the PMTCT

This study shows that one of the key factors that hinders adequacy and consistency in the implementation of the PMTCT when pertaining to children exposed to HIV is insufficient knowledge in certain aspects of the PMTCT. Thus, it is crucial for professional nurses to possess sufficient knowledge in order to provide quality care to children exposed to HIV especially when the guidelines that are used as the framework to prevent MTCT and initiate treatment, are constantly updated. Hence, activities such as continuous in-service training are

needed to bridge the knowledge gaps that come as a result of updates that are made in the PMTCT guidelines, and thus improve implementation of the guidelines. Providing professional nurses with continuous in-service training is critical because PMTCT is a programme that is accepted as a key framework that guides childcare for children exposed to HIV in South Africa. Therefore, any changes made in the guidelines needs to be implemented accordingly and all professional nurses should be updated on it, thus their involvement in planning and decision making is essential to change their attitude and foster successful implementation of the PMTCT services and accountability. This is importantly so because one participant expressed that *"we are tired of people coming from Cape Town and Jo'burg (Johannesburg) to tell us what to do yet they don't know how things work here".*

Habedi (2020) found that there was a lack of knowledge concerning the PMTCT programme among professional nurses. Another study conducted by Mutabazi et al. (2020) revealed that frequent changes in the PMTCT and ART guidelines presents challenges in ensuring that professional nurses implement updated guidelines hence the process of training and retraining is necessary. Other studies conducted in Ethiopia, Nigeria, and Zimbabwe, showed that after training was conducted with health professionals, the number of women and infants receiving PMTCT services improved significantly (Tolossa et al., 2020; Ibu & Mhlongo, 2021; Musarandega et al., 2020).

It appears that continued training/in-service training on the constant evolving PMTCT guidelines remains a key factor in the implementation of successful PMTCT services. Therefore, facility managers should ensure that professional nurses are provided with continuous in-service training on the updated guidelines to significantly improve the implementation.

5.4.2 Lack of human resources and consumable resources

This study's findings institute that the lack of adequate human resources remains a serious barrier to the implementation of the PMTCT services. Professional nurses who participated in this study pointed out that they do not have time to monitor and check whether guidelines are properly implemented or not because of work overload. It was noted in a study conducted by Zimba, Sherwood, Mark and Leeman (2021) that healthcare workers complained that the workload is too much in proportion to the staff, and as a result, mothers of children exposed to

HIV wait for too long and end up leaving the facility without being assisted. It is the professional nurse's professional duty to adequately implement the PMTCT services, but the management must provide them with all necessary support including human resources.

A study conducted by Onalu, Agwu, Okoye and Agha (2021) point out that health managers should employ more healthcare staff because they are needed to provide efficient services. Furthermore, Mohamed et al. (2020) in their feasibility and acceptability of implementing Early Infant Diagnosis (EID) at the point-of-care (POC) study, emphasised that hiring an adequate number of staff in facilities where POC EID services are implemented is critical. The challenge of shortage of staff cannot be ignored if the elimination of MTCT of HIV and ending new infections in children is to be achieved by 2030.

Another challenge raised in this study pertains to the lack of consumable resources in the healthcare facilities such as HIV PCR test kits. The consequences of not having a child's blood collected for HIV test in the first encounter are dire. Missed opportunity for EID, late treatment initiation, 'lost to follow-up' and child mortality are some of the consequences of test kit stock-outs. The unavailability of HIV test kits weakens the benefit of the PMTCT services, and it opens up a wide gap for 'lost to follow-up' to happen.

In a study conducted by Mongwenyana et al. (2020), professional nurses revealed that testing HIV-exposed children is not always possible because at times PCR test kits are not available. Similarly, Debelew, Fana and Habte (2020) highlight that shortage of dried blood sport (DBS) test kits is a common occurrence and mothers were sent back and told to come at another time. HIV test kit stock-outs remain a barrier to the full implementation of the PMTCT services that need serious measures to be put in place. Thus, supply chain management must be strengthened and well managed to prevent the continuation of stock-outs in rural healthcare facilities.

5.4.3 Challenges in the implementation of the PMTCT programme

Professional nurses revealed that they are willing to play their role in implementing the PMTCT services concerning children exposed to HIV. However, professional nurses clearly stated that the delay in PCR test results remains a challenge that needs serious attention. It is understandable why healthcare workers point out late PCR test results return as one of the major challenges that hinder the adequate implementation of the guidelines. The consequences

of late PCR results turnaround time include missed Early Infant Diagnosis (EID), late treatment commencement, and 'lost to follow up', especially in a situation where a mother had been visiting a facility several times without success to find results. This is of serious concern in rural areas where mothers struggle to get money for transport and facilities are far from where they live (Dirisu et al., 2020; Getaneh, Negesse & Dessie, 2021).

In a study conducted in Ghana, Ankrah and Dako-Gyeke (2021) found that the delay in receipt of PCR test results served as a barrier to mothers' utilisation of EID services for HIV-exposed infants. A study conducted in SA by Nongwenyana et al. (2020) found that turnaround time for birth HIV test results was a challenge as the results were often not available at the post-natal visit. The concerning part is the delay of turnaround time for PCR test results increases the chances of 'lost to follow' up which affects the child's life more than anything else. Lolekha et al. (2021), in Thailand, found that some HIV-positive infants received late PCR testing and some infants were lost to follow-up before diagnosis and returned to the healthcare facility when they were very ill.

Thus, tracking of mothers and their children should be given serious attention so that children exposed to HIV are retained in care. The challenges about tracking of mothers which were found in this study, are consistent with challenges that have been reported in other studies; there it was reported that tracking of mothers is the most critical challenge faced by PMTCT (Dirisu et al., 2020; Godfrey et al., 2020; Musarandega et al., 2020; Mutabazi et al., 2020; Naidoo, Archary & Kalawan, 2020). Such challenges increased the risk of MTCT of HIV, thus new strategies to counteract the challenges in the tracking of mothers and subsequently improve the implementation of the PMTCT are needed (Nydal, Munyaw, Bruun & Brantsaeter, 2021).

Successful tracking of mothers will assist in preventing non-adherence to treatment and improve retention in care. However, the most pressing concern is to get the mothers to disclose their HIV status to their families, husbands, and partners. Mothers' non-disclosure of HIV status coupled with non-compliance increases the chances of MTCT of HIV and prevents children exposed to HIV from benefiting from the PMTCT service. Disclosing their HIV status will prevent putting a child at risk of contracting HIV. Thus, concerted efforts to educate families, husbands and partners of mothers living with HIV about the benefits of the PMTCT are paramount because disclosure will ensure future support.

However, this study revealed that without full cooperation and support from a male partner, it would be extremely challenging to successfully prevent and end MTCT of HIV. A study conducted by Matula, Mamo, Kassie and Abate (2020) revealed that men are not willing to visit the clinic for couple HIV testing and forced mothers to discontinue follow-up care, but the mothers refused and had to find other precautions for the child. Hampanda et al. (2020) highlighted that mothers are scared to disclose their HIV status to their husbands fearing divorce and losing financial support, and this was so because mothers were always reminded by their husbands that should they become HIV positive, the marriage will be over. This exacerbates the risk of 'lost to follow up' because mothers who do not disclose their status are likely to get lost to follow up; because they do not want to be tracked into their homes (Mongwenyana et al., 2020).

Contrary, Ngangue, Fleurantin, Adekpedjou, Philibert and Gagnon (2021) reported that 90% of mothers received financial support from their partners to attend a clinic. A commitment to support mothers was noted in a study conducted by Mabachi et al. (2021) where they reported that male partners indicated a willingness to receive text messages to support their pregnant partners' PMTCT engagement and medication adherence. The positive findings of the above studies with regard to partner support are encouraging; however, more intervention strategies to further improve partner involvement and continuous support in the PMTCT programme are needed.

5.5 CONCLUSION

Professional nurses are determined to provide quality care to children exposed to HIV including their mothers. However, continuous training/in-service training of professional nurses particularly in the rural setting, where there are no other clinicians such as doctors that are always available to intervene, needs to be prioritised. Facility managers should ensure that the latest updated PMTCT guidelines are made available in the healthcare facilities and that staff are aware. A dedicated transport to collect blood specimen from the facilities directly to the laboratory is needed to avoid the long stay of specimen in a facility. Strong collaboration and communication between the facility staff and laboratory staff should be strengthened to ensure that HIV PCR test results are communicated to the professional nurses and uploaded into the

system timeously. The supply chain management should be strengthened and managed appropriately to avoid issues of HIV test kit stock-outs which have a devastating effect.

Facility managers should seriously address the issue of shortage of staff with the Department of Health. Task shifting should be realised by hiring community health workers to assist with other tasks that add a workload to an already overwhelmed staff. A sustainable and effective method that would be used to track and follow up with mothers is necessary to prevent 'lost to follow up' and to retain mothers and their children in care. Continuous education of families about the benefits of PMTCT services and the importance of providing support to mothers living with HIV is essential. In the same vein, a male should be involved in the PMTCT engagements to better understand why they should support their partner especially when it comes to getting an HIV test and disclosure of HIV status.

SECTION TWO: RESULTS AND DISCUSSION ABOUT MOTHERS OF CHILDREN EXPOSED TO HIV POPULATION

5.6 DEMOGRAPHIC INFORMATION OF MOTHERS OF CHILDREN EXPOSED TO HIV PARTICIPANTS

In this study, the population was caregivers and biological mothers were actual caregivers. A total of ten mothers were individually interviewed using a semi-structured interview guide. As indicated in Chapter 3, this number was determined by data saturation and a specifically outlined inclusion criterion. All the participants in population two were females who were the biological mothers of HIV-exposed children, thus no males participated. The participants' ages ranged from 23 to 38 years. Children's gender: there were six (6) boys and four (4) girls. The children's ages ranged from 1 month to 16 months.

5.7 PRESENTATION OF THE FINDINGS FROM MOTHERS OF CHILDREN EXPOSED TO HIV

Four main themes emerged from the analysis of the collected data. All themes emerged under Objectives 3 and 4. Each theme was further divided into categories and sub-categories. Table

5-2 below presents a summary of the results according to the themes, categories, and sub-categories.

Table 5-2: Themes, sub-themes, and sub-categories from parents

	Themes	Sub-themes	Sub-categories
Objective 2: Perceptions of parents on childcare received in the rural health facility	**Theme One**: Health benefits from visiting the healthcare facility	Expected services received	• Nevirapine • HIV PCR Test • Blood test results
		Communication and information needs 1. Information received	• Infant diet and feeding • Importance of medication
		2. Unmet information needs	• Child`s diet • Medication • Child`s HIV test results
	Theme Two: Professional nurses' attitude	Professional nurses` negative attitude	• Not supportive • Not kind • Lack of respect
		Effect of professional nurses` negative attitude	• Fear to ask for information • Emotional stress • Patients feel unhappy • Risk of loss to follow up
		Attitude expected from professional nurses	• Respect • Support • Kindness • Clarity • Be patient
	Theme three: Healthcare administration system	Poor administration	• Long waiting time • Perceived shortage of staff
Objective 3: Parents' perceptions of their role in the prevention of the spread of HIV infection to their children	**Theme four**: Significance of the role of a mother in PMTCT	Commitment to better child's health	• Child`s follow-up visit • Daily medication for both mother and baby • Collecting medication monthly and blood test results • Exclusive breastfeeding for six months
		Support associated with the disclosure of HIV status	• Family support • Partner support • Partner reluctant to test for HIV

5.7.1 Theme one: health benefits from visiting healthcare facility

Health benefits from visiting the healthcare facility refer to the childcare services that are provided to children such as PMTCT, assessment and diagnostic tests, medication, as well as communication by the healthcare staff. The participants in this study agreed that there are multiple childcare health benefits in the healthcare facility and these benefits are crucial, especially to children exposed to HIV. Thus, when mothers take their children to healthcare facilities, they expect their children to receive these services pertaining to childcare.

5.7.1.1 Sub-theme 1: Expected services received

This study found that mothers do everything they can to visit the healthcare facility for their children to receive quality childcare services according to the PMTCT guidelines. The expected services to be provided to children exposed to HIV include administration of nevirapine, HIV PCR blood test sample and provision of blood test results among others. The following verbatim quotes illustrate this:

> *"...she* [the child] *was given medication* [nevirapine] *that was supposed to protect her... They* [nurses] *also took some blood test* [HIV PCR]" (*P3).*

> *"...they also gave them* [twins] *medicine so that they should not be infected by HIV" (P5)*

> *"I am happy that after birth he was given nevirapine in the clinic" (P7).*

The mother's understanding of the benefit their children are supposed to receive when visiting the healthcare facility was noted when some mothers opted to visit the hospital because the healthcare facility was closed due to a strike.

> *"I always get baby`s medication to drink in the clinic, it was only when there was a strike that I couldn't get any medication, we had to go to hospital because the clinic was closed." (P10).*

The mother's expectations that their children should get tested for HIV and receive nevirapine which is one of the benefits of visiting the healthcare facilities, were met because the blood test

samples were collected from the children and the nevirapine was administered and provided. The following quotes illustrate this:

> *"When I brought her for body mass checking they also took blood. They found the blood result still negative" (P2).*

> *"The baby gets everything like at birth she was given medication* [nevirapine] *that supposed to protect her. They also took some blood test" (P6).*

5.7.1.2 Sub-theme 2: Communication and information needs

Communication between mothers and healthcare workers is another essential benefit of visiting the healthcare facility. This is so because it helps the mothers to be empowered with the information they need in order to provide childcare at home effectively after leaving the healthcare facility. Proving mothers with enough relevant information during consultation is one of the crucial aspects with regard to childcare especially because not all mothers can read and comprehend the information on their own.

Information received

In this study, mothers reported that they received helpful information regarding childcare from the professional nurses with regard to infant feeding and breastfeeding which was seen as a great benefit of visiting the healthcare facility. The following quotes illustrate this:

> *"They* [nurses] *explained to me that the child is not to be given anything until she is six months old, the baby should not eat any food" (P1).*

> *"You* [mother] *don't mix breastfeeding with formula milk. Yes, you either breastfeed or give formula, not both and wait until the baby is 6 months to give soft food and water" (P8).*

Communicating information to mothers with regard to medication and its importance remains critical; more so, because children exposed to HIV depend on their mothers to stay free from the virus. Thus, even CHW went the extra mile to provide mothers with such information. The following quotes illustrate this:

"…they [nurses] *explained to me that in the morning I must give the baby her nevirapine so that she should not get infected" (P4).*

"*The nurse said the baby is negative but there is possibility of being positive as time goes especially if I don`t take my treatment and give her* [the child] *own treatment too" (P6).*

This study found that professional nurses did not merely focus on childcare, but they also focused on the mother's care which is another great benefit of visiting the healthcare facility. It seems that professional nurses did that because it is not possible to prevent MTCT of HIV if mothers are completely left out. Hence, information with regard to treatment adherence is seen as an additional benefit not only to the mother's care but also to childcare as well. The following quotes illustrate this:

"I [mother] *was instructed to take this treatment every day at the same time, and I do exactly that… I can see change in my life" (P3).*

"I spent time in the consulting room. The professional nurse was explaining that I must accept my status and take treatment at 20:00 hours every day" (P7).

Unmet information needs

This study revealed the major benefits of visiting healthcare facilities, especially for children exposed to HIV. This study's findings showed that even though mothers were provided with very helpful beneficial information pertaining to childcare, there were instances where mothers did not receive much-needed information from the professional nurses. The following quotes illustrate this:

"I remember they just told me you must breastfeed the baby…you are the mother now but at that time I didn`t know how to breastfeed this is my first baby… I got home and cried" (P9).

"I was just told to breastfeed the baby…don`t give solids but I was not given any reason of not giving solids" (P2).

Due to lack of information, one mother ends up taking medication incorrectly. The following quote illustrates this:

"Sometimes I will be sick, when they check me, they will find that I am not taking the treatment accordingly… I end up telling them that no one explained to me" (P10).

Communicating information pertaining to the availability of the blood test results and informing mothers when they should come back for blood tests results was not always done as shown in the following quotes:

"I don`t know why they don`t tell us that the baby result is there [clinic]…*luckily my baby results was negative when I got them after a long time" (P5).*

"When they take my baby's blood, they did not to tell me that I must come for blood results on this date" (P1).

5.7.2 Theme two: Professional nurses' attitude

The theme of professional nurses' attitude was the second theme that emerged under objective two in this study. This theme was about the perceptions of parents or caregivers on childcare received in the healthcare facility. In order for professional nurses to provide adequate childcare, mothers need to take the child to the facility. Furthermore, mothers have to understand the information given to them in order to continue to render efficient services pertaining to childcare at home. Thus, professional nurses' attitude is critical to ensure that childcare is provided without any disruptions.

However, it appears that professional nurses' negative attitude has a direct adverse effect on childcare in the sense that when mothers perceived the professional nurses' attitude to be unprofessional, they may end up not visiting the healthcare facility thus compromising childcare.

5.7.2.1 Sub-theme 1: Professional nurses' negative attitude

Mothers in this study expressed how negatively they were treated by some of the professional nurses during their visit with children in the facility. The following quotes illustrate this:

"My problem is the professional nurses without respect and negative attitude… just now I asked one of the nurses the place for changing the baby's napkin. Her response was you can go and change it on that road" (P4).

"Last time when I brought the baby for three days check-up one of the nurses told me to go and sit down, I told her that people who came late are forcing their way in. She was rude telling me to go and sit. I went to take a seat, but I was not happy because she was not respectful. I was hurt I even cried" (P7).

"Today again I nicely asked her something, eh…eh… she was rude, scolding at me. Many of them have got hurting words and ill-mannered [tears rolling down her face]" (*P6).*

At times mothers were not even given a chance to explain the reasons that made them attend Clinic A instead of Clinic B, instead, they were shouted at and sent back home. The following quote illustrates this:

"When I am from another clinic and come to this one bringing the baby, the nurse shouted me so badly and sends me back. Yoh, imagine the distance… she does not even ask the reason for bringing the child to this clinic. On that day I left without being attended to. I feel that attitude is not right" (P1).

5.7.2.2 Sub-theme 2: Effect of professional nurses' negative attitude

The effect of the professional nurses' negative attitude left mothers seriously distressed, hence some mothers contemplated not visiting the healthcare facility again as illustrated in the following excerpts:

"I always panic that I will meet nurse with rude attitude. I never relax because this affects me emotionally" (P9).

"When I know that tomorrow, I have to take my child to the clinic yoh… yoh… I just think of those hurting words they said to me…honestly sometimes I just don't want to come here" (P2).

One mother had this to say *"I`m still not happy because she was not respectful. I was really hurt…nurses always make you cry but I did not say anything because I don`t think I will come back here again yoh" (P8).*

5.7.2.3 Sub-theme 3: Attitude expected from professional nurses

This study found that some mothers expect certain attitudes from the nurses such as being treated with respect, kindness, and patience and be supported during their visits to the clinic. The following quotes illustrate this:

> *"If you ask her, I am new here, please can you explain to me the correct procedure. She would do that, tell you where to start and how to go about. She will tell you even the last person on the queue" (P5).*

> *"Some of them are good they have positive attitude. Those who are good talk to us polite, down to earth, and respectful. They are not harsh" (P10).*

> *"They treat you with care and they talked to you with respect. I can only speak for myself; I do not know about how other people feel you see" (P3).*

5.7.3 Theme three: healthcare administration system

It is critical for healthcare facilities to be adequately equipped with resources such as human, financial, consumables, and infrastructure to provide childcare services in a faster manner that is efficient and effective.

5.7.3.1 Sub-theme 1: Poor administration

The mothers reported their frustration with the slow service delivery which resulted in them having to spend long hours in the clinic before being seen by the professional nurses. The following quotes illustrate this:

> *"Hey, we spent a lot of time here in the clinic. When I come to the clinic, I know that the clinic is like park station" (P10).*

> *"The problem is waiting long periods in this clinic. You come early in the morning but around this time, which is 11 am you are still waiting to be helped" (P4).*

On the other hand, some of the participants were of the view that the delays in care delivery experienced were due to a shortage of staff as illustrated in the following extracts:

"The clinic is short of staff… it is the way I always see the clinic full, when you come to the clinic you spend the whole day here, you would arrive here at around 6 am and you would leave late midday" (P9).

"Nurses must be increased so that we spend less time in the clinic. We come early so that we can go to work, remember we are desperate to work, to be jobless is a problem" (P1).

The mothers attributed the non-explanation of the received treatment from the clinic to staff shortages as illustrated in the following excerpt:

"Most of the time we only take treatment and go because there is a problem of few nurses here" (P7).

On the other hand, childcare seemed to be compromised due to inadequate infrastructure in the healthcare facility to hold support groups for mothers. The following quote illustrates this:

"I think if support groups can be formed again…, it was once there in this clinic called… Support Group and it was not successful because there was nowhere we could sit, we used the room in the clinic which is used to check pregnant women" (P8).

5.7.4 Theme four: Significance of the role of a mother in the PMTCT

The theme significance of the role of a mother in the PMTCT emerged as a fourth theme under objective three in this study, which concerned itself with parents' or caregivers' perceptions of their role in the prevention of the spread of HIV infection to their children. The biological mothers who are caregivers in this study have an unprescribed yet major role to play to ensure that their children are born and continue to live without HIV which could be attributed to MTCT. The theme was divided into two categories; these are termed commitment to better a child's health and support associated with the disclosure of HIV status.

5.7.4.1 Sub-theme 1: Commitment to better child's health

Commitment to better child's health was demonstrated by mothers who were committed to doing everything to ensure that their children did not contract HIV. For instance, some mothers expressed that they administered nevirapine according to the professional nurse's instructions without fail. This point is illustrated by the following quotes:

"…in the morning we give the baby her nevirapine so that she should not be infected" (P2).

"I also take care of my baby by making sure that the baby gets treatment in the prescribed manner, every morning" (P9).

"In the morning the baby drinks her own medicine [nevirapine]*... the one that I got from the clinic to help her from getting the virus" (P7).*

This study revealed that mothers continued to play their perceived role to prevent the spread of HIV by expressing their commitment to the baby's health by making sure that they breastfed their children as per healthcare workers' instructions. The following quotes illustrate this:

"I only give my child breast milk until he's six months as I was told by the nurses …because I don't want anything to happen to him. I'm even scared to give him even little food …you see" (P3).

"My child is given only breast milk for six months. The child is not given any food, you don't even give water" (P10).

One mother reported her commitment to ensuring that her child was not mixed-fed as illustrated by the following quote:

"You see, if I go away, I do not take long because of breast feeding…tjoo… tjoo, sometimes I do express [breast milk] *from the breasts and they give her expressed milk" (P5).*

This study also found that mothers were not only committed to bettering their child's health but they were also committed to their health by taking their treatment without fail, in order to minimise the possibility of transmitting HIV to their children. The following quotes illustrate this:

"I will never stop taking treatment. I will always take them. I never miss treatment. I want them [twins] to be perfect" (P5).

"I take my medication on time, 8 o`clock evening" (P3).

The mothers' commitment to better their child's health was noted from the mothers who tirelessly attend the child's appointment at the healthcare facility either to collect medication, blood test results and or the child's follow-up check-up. This is confirmed in the following quotes:

> *"I have never missed any appointment or medication because I know that I will be cheating myself and my baby" (P1).*

> *"I have never stopped visiting the clinic otherwise I would not have medication for my baby…you see the other thing we have to go there for results" (P4).*

It appears that at times mothers face multi-layered challenges to fulfil their role in preventing the spread of HIV to their children. This point is illustrated by the following quotes:

> *"Sometimes I struggle to take my child to the clinic because I don't have money…" (P6).*

> *when my boyfriend doesn't have money, yoh I struggles a lot but sometimes I just go ask for a lift on the road" (P9).*

> *If I don`t have money for transport is a problem. Every time when I come here, I use R26.00 return journey (P2).*

This study revealed that the distance mothers have to travel to take their children to the clinic does not make their role, to better their children's health, an easy journey:

> *"I am far from the clinic. I use two transports when I come here" (P6).*

> *"I wish I was staying next to the clinic… the transport is a problem in this place yoh" (P3).*

5.7.4.2 Sub-theme 2: Support associated with the disclosure of HIV status

It appears that in order for the mothers to be able to fully better their children's health, they should first accept their own HIV status and then they should have great support from their families, husbands, and partners after disclosing their status. The family and partner's support

is critical to set a conducive environment for mothers to find it easy to disclose their HIV status when they are ready to do so. This is confirmed in the following quotes:

> *"I must accept…after accepting myself I reported to those that I live with. The aim is that the child must also be protected from being infected. I told the baby's father right from the beginning…" (P4).*

> *"I told my partner and I managed to tell my dad, but he accepted with ease, I told him I am on treatment" (P8).*

> *"I accepted, I said accepting is the first step. I immediately told my husband when I was from the clinic, then I told my mother and she told me that I should not miss any treatment. If you are on treatment, you will really live long" (P10).*

Contrary, sometimes mothers do not always get accepted by their families after disclosing their HIV status. This can be seen in the following quote from one participant:

> *"I was not going to tell anybody but after accepting then I told a friend of mine, she is the first one to know. I then told my mother, she did not accept it, later she passed away. I told my partner on my mother's funeral…he asked me where I got it" (P7).*

It appears that as much as the mothers are willing to play their role in ensuring that the child does not contract HIV by any chance, their partner's refusal to test for HIV does not show the same level of commitment to protecting the child from contracting an infection. This can be seen in the following quotes:

> *"I said to him my test came positive, … and when I told him that the baby is only having breast milk, we must protect him. He said he's not doing any test…the problem is that men do not want to test, do not want to use condom… eish I don't know what's wrong with them" (P8).*

> *"He refused to visit the clinics; he is very difficult. He keeps on saying I don`t have the virus and yet me as a woman I am HIV positive…he makes me his testing instrument" (P4).*

One mother shared that she had to set strict rules for her husband regarding sexual intercourse because her partner refused to test for HIV. This can be seen in the following quote from the mother:

"I immediately told him when I was from the clinic that I tested positive, he told me that he will not go to the clinic he doesn't have time, and I told him that if he is not going to go to the clinic, we will have to use condom non-stop" (P9).

5.8 DISCUSSION OF THE MAIN FINDINGS FROM MOTHERS WITH LITERATURE CONTROL

This segment aims to discuss the results from the mothers of children exposed to HIV in line with the research objectives, the theoretical framework employed in this study, and the literature. The aspects that are discussed in this section will cover the main themes and sub-themes that emerged from the analysis, conclusion, and chapter summary.

5.8.1 Health benefits from visiting the healthcare facility

All participants in this study agreed that there are numerous health benefits to taking children who are exposed to HIV to the healthcare facility. The health benefits from visiting the facilities include services that are provided to children such as infant nevirapine, HIV PCR blood test, obtaining the child's HIV test results, receiving relevant information on infant feeding, and nutritious food, the importance of infant nevirapine including their (mothers) own treatment as well as adherence. Mothers were aware that to protect their children from being infected with HIV, they ought to visit the healthcare facilities consistently because of the services available to keep children safe from the virus. Hence, every time mothers visit the facilities, they expected their children to receive the much-needed PMTCT services which are key to childcare.

The findings in this study showed that mothers were satisfied with the childcare services received such as infant nevirapine, HIV PCR test at birth and 10 weeks, information on infant feeding and nutritious diet, and the importance of medication. However, mothers expressed some concerns because some of the expected services which are critical to childcare were somehow not always received, such as blood test results and information that is helpful to childcare especially when the child is at home. The services that mothers expected are commendable

because if these services are consistently rendered, children are unlikely to miss services for early infant diagnosis and early treatment initiation which are critical in HIV-exposed children's management, and have dire consequences if missed or even delayed. A study conducted by Gill et al. (2020) in Uganda found that there were multiple missed opportunities for HIV prevention and delays in HIV testing of children exposed to HIV thus a number (39%) of children were not diagnosed until after 2 years of age, despite known maternal HIV status during pregnancy.

It is, therefore, essential that facilities are well equipped and functional to render adequate childcare because some mothers are motivated to visit facilities solely because they want to protect their children. This is so because it appears that mothers at times prioritise their children's health more than their own because in some instances, mothers, once they stop breastfeeding, tend to stop visiting the facilities which of course is not commendable. But it somehow shows desperation from mothers to do anything to see their children being HIV-free. A study conducted by Munkhondya, Smyth and Lavender (2021) reveals that mothers were retained in the Option B+ programme because they wanted to protect their infants. Therefore, some of the mothers stopped taking ART when their babies died or when they stopped breastfeeding. In another previous study conducted by Yee et al. (2020), caregivers chose not to go to work or the adult ART clinic so that they could attend the paediatric PMTCT clinic appointment.

Furthermore, the expected services that mothers received in this study are in line with other previous studies where it was reported that the majority of women interviewed received infant nevirapine prophylaxis for their infants, HIV PCR, and early infant diagnosis (Bitarakwate et al., 2021; Katzen et al., 2020; Jones et al., 2021; John & Harper, 2020; Desta et al., 2019; Dunning et al., 2018).

It is, therefore, not a surprise that mothers expected the professional nurses to communicate blood test results on time so that the childcare is not compromised particularly where the treatment needs to be initiated. Missed EID and late treatment initiation have a detrimental effect on the child's life. It is detrimental because at times after multiple returns to facilities for blood test results without success, mothers tend to give up. Therefore, a quick HIV PCR test results turnaround and communicating the results immediately remains a cornerstone to adequate childcare (Gaitho et al., 2021; Jones et al., 2021).

The study findings revealed that communicating relevant information to mothers with regard to childcare such as infant feeding and importance of treatment adherence, was one of the health benefits mothers expected from visiting healthcare facilities. Mothers expressed that they received helpful information pertaining to breastfeeding and treatment adherence which is essential to childcare especially post-delivery when mothers must care for the baby. Conveying information verbally is beneficial particularly in rural areas because some mothers cannot write or read. Providing mothers of children exposed to HIV with pertinent information is critical because of the possibility of MTCT during the breastfeeding period as some mothers are unaware of the risk of transmission from breastfeeding (Carroll, Booth, Campbell & Relton, 2020). Hence, Samburu et al. (2020) in Kenya reports that it is beneficial to provide mothers with information pertaining to breastfeeding, and soft food for the baby including other educational information such as child parenting. However, at times mothers do not receive such crucial information that is helpful to childcare, especially outside the healthcare facility.

So, not receiving the information on proper exclusive breastfeeding (EBF), administration of nevirapine and the importance of adherence to medication poses a risk to mix feeding the child which would severely compromise childcare. A study conducted in South Africa by Ngyende, Bucyubaruta and Mugero (2020) found that mothers were provided with inadequate information regarding the choice of infant feeding options as they were told to choose between EBF or formula feeding without being given adequate information about the specific conditions of formula feeding. Instead, the PMTCT staff merely told mothers that it is up to them as mothers to either EBF or give a baby formula for six months. Theodorah and Mc'Deline (2021) concur that the failure of the healthcare workers to provide mothers with information and practical assistance during the EBF initiation period led to some mothers eventually mix-feeding despite their intentions to EBF. Without the mother's involvement and engagement in childcare services, it is impossible to end new infections in children because mothers are the ones that must ensure the child receives necessary services that prevent MTCT, especially at home.

5.8.2 Professional nurses' attitude

The professional nurses' attitudes emerged as a second theme in the study. In this study, mothers expressed concerns about professional nurses' negative attitudes. One of the main reasons this

theme is important is because anything that affects the mother, will eventually compromise childcare that a child is supposed to receive from the professional nurses at the facilities. The professional nurses' negative attitudes have a direct impact on whether a child will receive the care needed or not. This is so because at times, mothers revealed that they get so hurt in such a way that they end up leaving the facility without the child being attended to.

The effects of professional nurses' negative attitudes have serious adverse consequences on childcare and the overall uptake of PMTCT services. In this study's findings, it became clear that mothers are motivated to visit facilities because they want to protect their children, but because of the negative attitude they experience from professional nurses, some mothers end up not visiting the facility. Thus, the effects of professional nurse's negative attitude poses a serious risk of 'loss to follow-up' and failure to increase uptake of the PMTCT services. Previous research has reported that one of the barriers to successful PMTCT uptake and retention among others was the negative attitude of professional nurses (Haas et al., 2016; Dirisu et al., 2020; Kassaw, Matula, Abebe, Kassie & Abate, 2020; Mpinganjira, Tchereni, Gunda & Mwapas, 2020; Nkhonjera, Suwedi-Kapesa, Kumwenda & Nyondo-Mipando, 2021).

It is concerning that mothers of HIV-exposed children continue to face unwelcoming attitudes from professional nurses. The researcher is of the view that there are legitimate issues that could be pointed to, as reasons for such negative attitudes projected on innocent mothers. Such issues could come from work-related frustrations or personal frustrations but whatever may be the cause of the negative attitudes, it needs to be adequately addressed because without the cooperation and involvement of the mothers, zero infection in children will not be achieved. Professional nurses should view mothers, particularly in the PMTCT programme, as one of the key stakeholders who are needed to play an additional role in achieving the elimination of MTCT (Clark, Sweet, Nyoni & Ward, 2020). A study conducted in Malawi by Laterra et al. (2020) found that creating an opportunity for mothers living with HIV, communities, and professional nurses to jointly identify issues and implement solutions contributed to improvement in the quality of PMTCT services. This improvement was attributed to the importance of involving people living with HIV in quality improvement and assurance efforts.

5.8.3 Healthcare administration system

The study findings revealed that the provision of proper childcare requires a well-resourced and efficient healthcare administration system. Mothers in this study pointed out that healthcare facilities are not well-resourced as they should be, and this was perceived to be so because mothers had to wait a longer time before the child gets to be seen by professional nurses. It has been well documented in literature that a long waiting time before receiving the care needed results in mothers and their children having to go back home without being attended to because of the slow services (Dirisu et al., 2020; Gill et al., 2020; Habedi, 2020; Tolossa, Kassa, Chanie, Abojobir & Mulisa, 2020; Warri & George, 2020). Long waiting times have a potential risk of LTFU, especially in the socio-economic status of mothers in rural areas, where it is a struggle to have money for transport to visit the facilities regularly, and the facilities are far from where the mothers live (Chimukuche et al., 2021; Habedi, 2020; Mpinganjira et al., 2020).

Even though mothers admitted that childcare was received in the facilities, they were of the view that work overload and shortage of staff were the main reasons for long waiting times and slow service in the facilities. The views expressed by mothers are similar to those reported in previous research findings where it was found that long waiting times were related to a shortage of staff, and equipment (Mutabazi et al., 2020; Songo et al., 2021; Zakumumpa et al., 2021). The issues perceived by mothers as the reasons for long waiting times are the issues that need management's intervention because it appears that as much as the professional nurses are at the forefront of service delivery, they are frustrated by the workload and lack of human resources. Morton et al. (2020) found that staff shortages, lack of resources, and poor infrastructure lead to nurses feeling overwhelmed and frustrated. This shows that the shortage of staff remains a critical barrier to PMTCT access (Baron & Kaura, 2021; Dirisu et al., 2020 Maputle, Ramavhoya, Makhado & Lebese, 2020; Mutabazi et al., 2020).

5.8.4 Significance of the role of a mother in PMTCT

The theme significance of the role of a mother in the PMTCT has to do with the care mothers provide to their children to prevent the spread of HIV infection. This theme is crucial to the successful implementation of the strategy because without the commitment of a mother, children are likely to contract HIV, and miss early infant diagnosis, thus late treatment initiation where necessary. In this study, the researcher learned that mothers were highly committed to

bettering their child's health through tasks such as adhering to exclusive breastfeeding, infant nevirapine adherence and their treatment at home and visiting facilities' appointments regularly and collecting blood test results. It is because of such commitments that mothers ought to be provided with relevant and adequate information to executive their unprescribed role of providing childcare in a manner that children do not contract HIV during the post-natal period.

Mothers perceived taking their treatment without fail as another important role they have to execute to prevent their children from contracting HIV. It is clear that the mother's role in preventing the spread of new infections is key to a successful implementation of the strategy and subsequently achieving zero new HIV infections among children. Thus, mothers need to be empowered with information, knowledge and practical skill activities that will help them to prevent the spread of HIV onto their children.

A study conducted by Acheampong (2020) found that as much as mothers, particularly those who gave birth for the first time, were happy that nurses provided them with information on breastfeeding benefits during ANC, mothers expressed that it would have been much more helpful if nurses demonstrated to them how to properly breastfeed once they had delivered. And that would have motivated the mothers to exclusively breastfeed as required without a problem. A study conducted by Ramoshaba and Sithole (2017) in rural areas in Limpopo found that the majority of mothers were aware of MTCT but did not understand the risk of MTCT after birth and how a mother can transmit HIV to her child during pregnancy, labour, and breastfeeding. Hence, the same authors recommended that healthcare personnel need to provide clear information on PMTCT activities.

As much as the mothers are committed to playing their role of protecting their children from HIV, they cannot successfully do so without support from their family members and partners. The support of family members and partners has a major contribution to treatment adherence, disclosure of HIV status, adequate childcare, and retention in care. Again, this shows that ending the spread of HIV is not an individual's task, but it requires all stakeholders to work together and play their professional and unprofessional roles efficiently and effectively. Thus, family support is essential because when mothers leave the child at home, the family will continue to provide childcare without any compromise. After all, the mother's status is known to the family and their partner. But if the mother's status is not known, childcare is likely to be

compromised as reported in a study conducted in Uganda by Operto (2020). This study reveals that families encouraged mothers to mix-feed the baby and that attitude was attributed to being unaware that the mother was HIV positive.

As much as mothers have assumed a responsibility to prevent the spread of HIV to their children, family support, including their partners, is still critical. The literature has shown that the support from the partners remains an influential determinant of the high uptake of the PMTCT services (Rodriguez, Parrish, Jones & Peltzer, 2020; M'baya Kansinjiro & Nyondo-Mipando, 2021). Previous research found that mothers felt more capable and confident about breastfeeding because their partners were supportive either through verbal encouragement or by being actively involved in breastfeeding activities, taking part in HIV testing and providing money for transport (Mannion, McDonald & Tough, 2013; Hampanda et al., 2020; Van der Straten et al., 2020; Nakamura et al., 2020; Jones et al., 2021; Gebremariam, Zelenko, Mulugeta & Gallegos, 2021). Adequate and consistent support from partners allows mothers to disclose their HIV status without fear of being stigmatised, judged and abandoned by their partners (King et al., 2020; Lorenzetti et al., 2021; Adeniyi, Nwogwugwu, Ajayi & Lambert, 2021).

5.9 CONCLUSION

Healthcare facilities should be adequately equipped with resources to provide expected childcare services on time, such as quick blood test turnaround time. Professional nurses ought to provide mothers with relevant adequate information regarding infant feeding and nutritious diet, and the importance of medication adherence. Furthermore, nurses should not only provide mothers with information, but they should also demonstrate practical skills to mothers on how to properly breastfeed, particularly after the mother has given birth and administer infant nevirapine while at home. Professional nurses should view mothers as the stakeholders that play a critical role in furthering the implementation of the PMTCT services and retaining children in care. Therefore, the negative attitude mothers experience when visiting the facilities should be eliminated by engaging nurses, and facility management to attend to issues perceived to be frustrating healthcare workers. Doing so will prevent the effects of negative attitudes such as LTFU.

Barriers to adequate childcare such as long waiting times at the facilities and shortages of staff must be mitigated to improve uptake of the PMTCT services and prevent further LTFU. Families and intimate partners of mothers living with HIV ought to be given relevant information on HIV transmission so that they could properly support mothers on EBF without being concerned that the child will contract a virus. Moreover, male partner support in childcare and agreeing to couple testing should be encouraged because it motivates mothers to disclose their HIV status and be consistent in providing uncompromised childcare.

5.10 CHAPTER SUMMARY

This chapter discussed the results of the qualitative study conducted with professional nurses and mothers of children exposed to HIV in line with reported studies in literature. The discussion was conducted in a narrative style in accordance with the study objectives. The next chapter highlights the development of the intervention strategy to improve PMTCT programme implementation for HIV-exposed children in the rural sub-district of the North West Province.

CHAPTER SIX

PHASE TWO: INTERVENTION STRATEGY DEVELOPMENT

6.1 INTRODUCTION

Chapter four presented the results of an integrative literature review and discussed them with literature control; whereas chapter five presented the empirical results of the study and discussed them with literature control. The two previous chapters discussed the research findings resulting from the answers to the research questions in relation to the first four objectives of the study. From this information, a summary of concluding statements presented in Table 6-1 below was formulated and these concluding statements assisted the researcher in finally addressing the main aim of this study, which was to design an intervention strategy to improve PMTCT programme implementation for HIV-exposed children in the rural sub-district in North West Province. However, before the design of an intervention strategy, the researcher will provide a detailed description of what a strategy is and the basis for a strategy formulation. Then the chapter will conclude with the process of strategy formulation.

6.2 WHAT IS A STRATEGY?

Strategy is defined as a set of plans or decisions made to help organisations to achieve their objectives, performing different activities to those performed by rivals or performing the same activities in a different manner (Wagner Mainardes, Ferreira & Raposo, 2014). Thus, a strategy is viewed as a plan of actions to be carried out over time, a means of moving from one point to another (Nickols, 2016). On the other hand, strategy refers to an organisation's "game plan", which provides a framework for managerial decisions, and reflects the organisation's awareness of how to achieve results consistent with the organisation's mission and objectives (Teece, 2018). The strategy process is described as a methodical, structured process whereby an organisation defines its vision and mission, identifies its direction, and ends within which to be obtained, and how these ends will be obtained, as well as how resources will be allocated and assigned, as well as accountability to ensure that the tactics and resources that have been allocated are employed (Nickols, 2016). Even though this strategy process is used in the business sector to compete successfully and have satisfactory performance, in this study the researcher is of the view that the healthcare sector needs a strategy process that is aimed at

improving the implementation of the PMTCT programme for HIV-exposed children in the rural sub-district in North West Province, in order to successfully achieve the elimination of mother-to-child transmission of HIV and meet the 2030 target (Vrazo, Sullivan & Phelps, 2018). In this study, organisations refer to a healthcare facility and the Department of Health. The Buse et al. (2005) Health Policy Analysis Triangle as the theoretical framework of this study, is a key component of the strategy developed to achieve this. It comprises four interrelated elements namely, actors (Who), context (Why), process (How) and content (What), which helps to understand why policy implementation does or does not succeed (Buse et al., 2005).

6.3 IMPORTANCE OF STRATEGY FORMULATION

Strategic formulation assists organisations to achieve their purpose and shaping their directions from the actual state they are to the target where they want to be in the future amidst the constantly changing environment (Thongsookularn, 2019). Thus, having a strategy in place is more beneficial compared to traditional long-range institutional planning, because strategies in most cases are well suited to generate the insights and relationships that produce value creation and sustainable programme accomplishment and implementation (Vaishnavi & Suresh, 2020; Thongsookularn, 2019). Additionally, a strategy management philosophy encompasses all aspects of the organisation at all levels, thus it is an important mechanism ensuring that the set of decisions and actions that result in the formulation, implementation and control of plans designed to achieve the organisation's vision and mission (Koekemoer & Von Solms, 2021; Adobor, 2019). The following are some of the benefits of strategy formulation as advocated by Ojogiwa, 2021; Tawse & Tabesh, 2021; Fuertes, Alfaro, Vargas, Gutierrez, Ternero & Sabattin, 2020).

- Strategy formulation activities enhance the organisation's ability to prevent problems as the involvement of all stakeholders focuses their attention on planning;
- Group-based strategic decisions are likely to be drawn from the best available alternatives;
- The involvement of members of staff on all levels improves the understanding of productivity and thus ignites motivation;

- Gaps and overlaps in activities amongst individuals and groups are reduced as participants clarify the differences in roles; and
- Resistance to change is reduced through awareness and understanding of the limits to options.

It is for these above reasons the researcher chose to design an intervention strategy to improve the implementation of the PMTCT programme in healthcare facilities in North West Province, in South Africa. This was done utilizing the application of the Health Policy Analysis Triangle of Walt and Gilson, 1994 as cited in Buse et al. (2005) to:

- Explore the actors' (Professional nurses and mothers of children exposed to HIV) understanding of the PMTCT programme content (their role and responsibility as outlined in the programme);
- Explore the process (how they view the current implementation process); and
- Explore the context as the impeding factors to the proper and efficient implementation of the PMTCT programme which could be situational, structural, or socio-cultural factors.

It is important to note that PMTCT will not be the only aspect of the strategy but when combined with the other aspects identified such as improved human resources, and infrastructure, the set goal of improving PMTCT programme implementation could be achieved. Hence, this study emphasises an important aspect which is the involvement of all key role players among others, particularly the implementers and end users. These role players should be involved from the planning phase of a strategy until the implementation stage which has been overlooked for the longest time when strategies are formulated.

6.4 CONCLUDING STATEMENTS FORMING THE BASIS OF THE INTERVENTION STRATEGY FORMULATION

The following table (Table 6-1) summarises the concluding statements that form the basis of the intervention strategy.

Table 6-1: Concluding statements of the analysis from the integrative literature review and empirical research data

Integrative literature review	**Empirical research data**		
Objective one	**Objective two**	**Objective three**	**Objective four**
To conduct an integrative review to explore the characteristics of intervention strategies used to improve the implementation of health policies globally and particularly in the rural areas	To explore the professional nurses' perceptions and attitudes on the PMTCT programme implementation pertaining to HIV-exposed children	To explore the perceptions of parents (of children exposed to HIV) on childcare received in the rural sub-district health care facilities	To explore the parents' perceptions of their role in the prevention of the spread of HIV infection to their children
Concluding statements	**Concluding statements**	**Concluding statements**	**Concluding statements**
1. There is a clear relationship between training and strategy implementation, hence a majority of strategies point out that training remains a key to significantly improving strategy implementation (see paragraph 4.9.2.1)	**13**. There is an inadequate number of nurses trained on how to properly implement guidelines and manage HIV-exposed children and their mothers in rural areas (see paragraph 5.1.2.1.1)	**25**. A delay in HIV PCR test results turnaround time is perceived as a hindrance to implementing appropriate childcare (see paragraph 5.3.3.1)	**34**. Participants expressed commitment to exclusive breastfeeding their children at least for a period of six months (see paragraph 5.3.5.1)
2. Adequate number of staff, HIV test kits, and medication are highlighted as critical components to successful strategy implementation (see paragraph 4.9.2.3)	**14**. Continuous in-service training is needed to refresh and keep nurse's knowledge up to date on the new PMTCT guidelines	**26**. Inadequate information provided to mothers on infant feeding, nutritious diet, and the importance of treatment	**35**. There is a commitment from parents to administer child's medicine (nevirapine) at home and take their

Integrative literature review	Empirical research data		
Objective one	**Objective two**	**Objective three**	**Objective four**
	pertaining to HIV-exposed children (see paragraph 5.1.2.1.1)	adherence, weakens the mother's role (see paragraph 5.3.1.2.2)	treatment but at times they are given medicine without any explanation (see paragraph 5.3.5.1)
3. A fast-tracking mechanism to improve turnaround time for HIV PCR blood test results must be in place at the facility level (see paragraph 4.9.2.3)	**15**. Healthcare workers are not involved in planning and decision making pertaining to the implementation of the PMTCTs services instead they are told by people from Cape Town and Joburg what to do (see paragraph 5.1.2.1.1)	**27**. There is a lack of information given to mothers on how to administer nevirapine at home, including their treatment compromises proper treatment administration (see paragraph 5.3.1.2.2)	**36**. Parents are committed to taking their treatment, especially during the breastfeeding period, after that some parents do not adhere to treatment (see paragraph 5.3.5.1)
4. There must be good communication between professional nurses at the facility and laboratory staff (i.e., Flagging HIV-positive test results by laboratory staff and	**16**. A dedicated transport to collect blood specimen from the facilities to the laboratory to avoid a long stay of specimen in the facilities is	**28**. There is a lack of practical demonstration on how to properly breastfeed after delivery. Another breastfeeding demonstration should be done	**37**. There is a relatively good commitment from the parents to attend the clinic because they want their children to receive necessary care from

Integrative literature review	Empirical research data		
Objective one	**Objective two**	**Objective three**	**Objective four**
immediately communicating the results to nurses) (see paragraph 4.9.2.1)	key to the implementation of the PMTCT (see paragraph 5.1.2.3.1)	post-natal period instead of a once-off session which is often conducted during the antenatal period (see paragraph 5.3.1.2.2)	the PMTCT programme (see paragraph 5.3.5.1)
5. Adequate communication between professional nurses and mothers of children exposed to HIV remains a key to successful strategy implementation (see paragraph 4.9.2.1)	**17**. Professional nurses do not always find HIV PCR test results available in the laboratory (see paragraph 5.1.2.3.1)	**29**. There is consensus that professional nurses' negative attitudes affect childcare because some mothers do not return to the facility (see paragraph 5.3.2.1)	**38**. Participants revealed that at times they do not return to the clinic due to lack of transport money, and long distances to get to the clinic (see paragraph 5.3.5.1)
6. Involvement of professional nurses, counsellors, community health workers, and mothers of children exposed to HIV in strategy planning and decision making is essential to improve the implementation of a strategy (see paragraph 4.9.2.2)	**18**. The delay in the return of HIV PCR test results on time demotivates professional nurses (see paragraph 5.1.2.3.1)	**30**. Long waiting time at the facility hinders childcare because mothers end up being sent back home and told to come back some other time (see paragraph 5.3.3.1)	**39**. There is relatively good progress in disclosing HIV status to partners and or families, but a majority of mothers still do not disclose their HIV status (see paragraph 5.3.5.2)

Integrative literature review	Empirical research data		
Objective one	**Objective two**	**Objective three**	**Objective four**
7. There must be a support group for mothers of children exposed to HIV at the facility level (see paragraph 4.9.2.3)	**19**. There is consensus that shortages of HIV PCR test kits and medicine at the facility level hinder the implementation of the PMTCT guidelines (see paragraph 5.1.2.2)	**31**. Mothers perceived the shortage of professional nurses as one of the contributing factors to the long waiting time (see paragraph 5.3.3.1)	**40.** Some mothers choose not to engage in sexual intercourse with their spouse, especially during the breastfeeding period because their spouse refuses to use protection and to test for HIV (see paragraph 5.3.5.2)
8. There must be adequate infrastructure with enough space for staff offices, consultation rooms, and support group meetings (see paragraph 4.9.2.3)	**20**. Inadequate number of staff at the facility level contributes to failure to track mothers of children exposed to HIV (see paragraph 5.1.2.2.2)	**32**. Essential information regarding the benefits of the PMTCT services is key to improving the implementation of the PMTCT programme (see paragraph 5.3.1.2.1)	
9. Involvement of family and male partners in the PMTCT programme remains a key component to significantly	**21**. There is no effective method at the facility to track mothers and their children postnatally to retain	**33**. There is a lack of support groups for mothers of children exposed to HIV at the facility	

Integrative literature review	Empirical research data		
Objective one	**Objective two**	**Objective three**	**Objective four**
improving strategy implementation (see paragraph 4.9.2.3)	them in care (see paragraph 5.1.2.2.2)	level due to lack of space (see paragraph 5.3.5.2)	
10. Disclosure of HIV status is key to enhancement of strategy implementation, hence couple testing and support are critical (see paragraph 4.9.2.4)	**22**. Managers are perceived to be unwilling to employ more staff including community health workers (see paragraph 5.1.2.2)		
11. Continuous awareness of PMTCT education for mothers of HIV-exposed children is important in order to improve the implementation of a strategy (see paragraph 4.9.2.4)	**23**. A lack of HIV status disclosure to partners and families contributes to poor implementation of the PMTCT (see paragraph 5.1.2.2.3)		
12. Adequate staff for continuous supervision and training of other professional nurses is essential in ensuring consistency in strategy implementation (see paragraph 4.9.2.4)	**24**. There is poor treatment compliance on the mothers' side, hence persistent mother-to-child transmission (see paragraph 5.1.2.23)		

6.5 THE PROCESS OF INTERVENTION STRATEGY FORMULATION

The intervention strategy to improve PMTCT programme implementation for HIV-exposed children in the rural sub-district in North West Province, South Africa, was formulated based on the concluding statements (see Table 6-1) that were generated from the integrative literature review and empirical qualitative research study. The intervention strategy formulation process entails developing a vision, mission statement, values, principles, goals, and objectives as well as functional tactics. Developing a vision and mission statement is the first step of strategy formulation (Thongsookularn, 2019).

6.5.1 Vision

A vision statement provides the road map for the organisation in the future; thus, it has been defined as the image the organisation would like to be in the future and the framework for its strategic planning for both short and long terms goals (Thongsookularn, 2019). In addition, a vision statement specifies where an organisation is going hence the inclusion of a vision statement in management's decision making is essential because of the question "where do we want to be in 5- or 10 years' time"? helps to bring clarity to an organisation's priorities and limited resources (Bowen, 2018). The author further states that the vision statement may apply to an entire organisation or to a single unit of that organisation and it is normally expressed through a simple one-line vision statement.

The Department of Health in South Africa has a clear one-line vision statement which is to provide "a long and healthy life for all South Africans" (National Department of Health Strategic Plan, (2020). This vision statement points out the dream of the Department of Health for all South Africans, including all those individuals that are living with HIV/AIDS and children, as well as the children who are exposed to HIV. However, based on the findings of this study, it will be impossible to achieve this dream in the HIV/AIDS programme if PMTCT programme implementation is not improved.

In the researcher's quest to formulate an intervention strategy to improve PMTCT programme implementation, the following vision was, therefore, formulated based on the findings which show that there is a need for the ethos of quality in all aspects and by all role players (refer to concluding statements 1; 2; 3; 4; 5; 10; 13; 14; 18; 19; 21; 23; 24; 27; 28; 34; 35; 36).

***Vision**: To provide a quality-driven PMTCT programme to ensure a long and healthy life for all children exposed to HIV.*

6.5.2 Mission

A mission statement defines the broad purpose for which an organisation exists, and which is in line with the values and expectations of major stakeholders and concerned with the scope and boundaries of the organisation. Unlike a vision statement, a mission gives an organisation direction on how to get there (Bowen, 2018). Thongsookularn (2019) adds that a mission statement can reflect the value and priority of decision making and differentiate the company from others, and identify the unique scopes of the company's operation, the product offered, and the market served that meets the customer's demands.

The mission statements on both provincial and district levels must be aligned with those on the national level. Moreover, the input should be sought from all levels of the PMTCT programme to arrive at a comprehensive mission statement, and on the provincial and district levels of all stakeholders (such as healthcare workers and mothers of children exposed to HIV) should be provided with the opportunity to provide their input. The involvement of stakeholders at all levels is crucial because they may see the potential of an organisation differently than management does, and these stakeholders can provide valuable insights into potential long progress. Involving stakeholders, particularly healthcare workers has been referred to as a golden rule because it can create a level of commitment and sense of ownership that enhances the future effectiveness of the organisation (Bowen, 2018).

The mission statement for the Department of Health in South Africa is "to improve the health status through prevention of illness, disease, promotion of healthy lifestyles, and to consistently improve the healthcare delivery system by focusing on access, equity, efficiency, quality and sustainability" (National Department of Health Strategic Plan, 2020).

As much as the mission statement highlights one aspect of awareness creation which is focusing on access, equity, efficiency, quality, and sustainability. However, the professional nurses who need to ensure that the efficiency and quality of healthcare delivery they provide to their clients (children exposed to HIV) is improved, should be included. As it stands, the assumption that might be made by the Department of Health is that the mission statement is

inclusive, perhaps the inclusion of professional nurses needs to be explicitly mentioned. Based on the research findings, the following mission statement was formulated (refer to concluding statements 6; 7; 8; 12; 15; 16; 17; 19; 20; 22; 27; 29; 32; 30; 33)

***Mission**: To ensure a safe, friendly environment for children exposed to HIV and their mothers through consistent application of role-related activities by the professional nurses and the health system for training activities for all professional nurses, thus improving PMTCT programme implementation.*

6.5.3 Values

Bowden (2018) states that values are the foundation of everything that the organisation does, including its vision, mission, and operations thus they allow employees within the organisation to agree upon what is considered good, or worthy. The author further states that values allow common goals that offer guidelines for both individual and group behaviour hence it is essential that values be integrated as the backbone of the mission statement to emphasise how they are being operationalised. It is, therefore, important to try to understand the values that are common to the healthcare workers and mothers of children exposed to HIV within the healthcare facilities in North West Province, South Africa. In this study, it was noted that common values that participants hold pertaining to the importance of the PMTCT programme have a strong influence on PMTCT implementation. Therefore, the following are some of the core values that are linked to the findings of this study (see concluding statements 1; 4; 5; 6; 14; 28; 29) which drive this intervention strategy.

- **Teamwork:** According to Otache (2019), teamwork is an indispensable feature of organisational life, particularly in hospitals and banking setups among others. Thus, the author defined teamwork as a distinguishable set of two or more people who work interdependently and in unity to carry out certain activities to accomplish common goals and improve the overall performance of the organisation. The same author further states that teamwork allows members to develop effective and mutual relationships in accomplishing goals through sharing of knowledge and skills. In this study, teamwork will mean there must be deliberate continuous knowledge, skills sharing among all role players, and good communication between professional nurses at the facility and laboratory staff, counsellors, community health workers as well as mothers of children

exposed to HIV. Adequate communication will allow all role players to have effective work relationships and understand their day-to-day operations thus working towards the same goal(s) which is to improve the implementation of the PMTCT programme.

- **Respect:** Respect is viewed as an act of respecting each other and their roles, acknowledge, and be considerate of their ideas as well as their unique contributions (Roberts & Goodhand, 2018). In this case, respect is viewed as treating all role players involved in providing health care and end users with respect and consulting them to share their views on any form of planning and decision making processes that impact their practice in the broader aspect of the PMTCT implementation.

6.5.4 Principles

The following principles should be respected and adhered to in order to ensure that the intervention strategy to improve the implementation of the PMTCT programme is well implemented. The researcher formulated these principles based on the findings of the study (see concluding statements 1; 2; 6; 8; 12; 13; 14; 16; 19; 22; 25; 31) that are applicable to the study.

- **Democratisation:** This study revealed participants' lack of involvement in decision making as a barrier to the implementation of the PMTCT programme. Therefore, decisions made at the healthcare facilities/units' level should be transparent, participatory, and involve all professional nurses who work directly with the patients in the PMTCT programme. Furthermore, healthcare facilities ought to formulate a shared responsibility to both the mothers of HIV-exposed children and healthcare providers in health-seeking and provision of PMTCT services. The involvement of all relevant stakeholders in strategy development up to implementation, forms a sense of ownership and thus has the potential to improve the implementation of the PMTCT programme.

- **Development:** Professional nurses should be provided with equal opportunities to undertake the relevant training and receive continuous in-service training on the PMTCT services. Healthcare facilities should maintain a national and international commitment to the implementation of the PMTCT programme by ensuring that the resources are adequately allocated and utilised efficiently. Thus, it is crucial for personnel at a national level with the necessary authority to allocate resources to be

well versed in what people on the ground level require in order to properly implement services to patients.

- **Quality:** Healthcare facilities should uphold high professional ethical standards through human dignity and human rights, confidentiality and be sensitive to cultural matters in their implementation of the PMTCT services. Furthermore, healthcare facilities should provide evidence-based services, be gender-sensitive, culturally sensitive, and socially accountable to all actors in the health system pertaining to the implementation of the PMTCT programme.

6.5.5 Goal and objectives

Each strategy must have a goal and objectives to inform the plan (Chugunov & Makohon, 2019). In this study, the goal of the intervention strategy is to improve PMTCT programme implementation for HIV-exposed children in rural areas. The following section is the discussion of the objectives for reaching the set goal.

6.5.5.1 Intervention strategy objectives

Objectives are the areas where the effort has to be made to drive organisations from motive to action, and they can be classified as long-term and short-term objectives. The long-term objectives are the statements that are made to indicate the results that the programme aims to achieve over a number of years (Thongsookularn, 2019). Furthermore, the author suggests that the importance of setting long-term objectives provides a direction in controlling major activities designed to accomplish the programme's objectives for a long time.

In this study, the aim of developing a strategy was to improve the PMTCT programme implementation for HIV-exposed children in the rural sub-district in North West Province. Thus, the strategic objectives were aligned with the vision, mission, and principles of the strategy to improve the PMTCT programme implementation for HIV-exposed children based on the comprehensive concluding statements from the integrative literature review and empirical research data (see Table 6-1). The concluding statements were then grouped in order to develop the intervention strategy's objectives. As indicated earlier that long-term objectives can be completed over several years, thus, in this study, the long-term objectives were focused on the areas such as knowledge acquisition, employee development, service delivery, employee

relations, and public responsibility. These objectives had to be understandable, acceptable, flexible, motivating, measurable and achievable (Jooste & Fourie, 2009). The table below (Table 6-2) indicates the intervention strategy's objectives and concluding statement from the empirical research, serving as evidence.

Table 6-2: Objectives of the intervention strategy to improve PMTCT programme implementation for HIV-exposed children in the rural sub-district in North West Province, South Africa

Intervention strategy objectives	Evidence/concluding statements
1. To improve the knowledge, the attitude of professional nurses and practice in all healthcare facilities in North West Province	Professional nurses admitted having insufficient knowledge on the aspect of the PMTCT guidelines which serves as a hindrance to properly implementing the PMTCT programme and a lack of nurses' involvement in planning and decision making thus affecting their attitude to practice (concluding statements 1; 6; 12; 13; 14; 15)
2. To improve mothers' role in the prevention of the spread of HIV infection to their children at all healthcare facilities in North West Province	Mothers are committed to exclusively breastfeeding the child; administer the child's medicine; however, they stated that it would be more helpful to have multiple practical demonstrations on how to properly breastfeed the child after delivery instead of a once off session which is often conducted prior the delivery period (concluding statements 27; 28; 34; 35; 36)
3. To improve childcare services through quick turnaround time of HIV PCR test results in all healthcare facilities in North West Province	Professional nurses reported that a delay in HIV PCR test results return to contribute to poor implementation of the PMTCT programme and mothers mentioned being demotivated to keep on coming to the healthcare facility without finding HIV test results for their children. The establishment of a fast-tracking mechanism for

Intervention strategy objectives	Evidence/concluding statements
	HIV PCR test results and good communication between professional nurses at the healthcare facility and laboratory staff is imperative (concluding statements 3; 4; 16; 17; 18; 25)
4. To improve human and consumable resources to adequately implement the PMTCT programme in all facilities in North West Province	The majority of the participants reported a shortage of professional nurses, and stock-out of HIV test kits and medicine remain a hindrance to the implementation of the PMTCT programme (concluding statements 2; 12; 19; 22; 30; 31)
5. To build a strong communication channel to disseminate adequate information to professional nurses and parents of children exposed to HIV in all healthcare facilities in North West Province	The majority of the participants in the study reported that lack of and inadequate information impedes proper implementation of the PMTCT programme and further contributes to mothers' lack of disclosure and acceptance of their HIV status (10; 23; 11; 26; 32; 35; 39; 40)
6. To establish an efficient method to track mothers of children exposed to HIV in all healthcare facilities in the North West Province	Participants in the study reported that insufficient mother-tracking methods contribute massively to the failure to implement the PMTCT programme (concluding statements 20; 21; 29; 37; 38)
7. To improve infrastructural development for both professional nurses and mothers of HIV-exposed children in all healthcare facilities in the North West Province	There are no adequate staff offices, consultation rooms and no mother support group space in the healthcare facilities (concluding statements 8; 33)

6.5.6 Functional tactics

Functional tactics are the key operational activities that are performed to achieve the objectives of the intervention strategy which would improve the overall performance and achieve the organisational goals (Otache, 2019; Thongsookularn, 2019). Therefore, in this study, the functional tactics were defined as the key activities that were planned for the implementation

of the intervention strategy based on the findings of the study. These functional tactics aim to address the identified issues in chapter four (integrative literature review) and chapter five (empirical research study) results as shown in the concluding statements table (Table 6-1). The following table (Table 6-3) below, depicts the objectives and functional tactics to achieve them. In addition, numbers are used to refer to the concluding statements as shown in Table 6-1.

Table 6-3: Functional tactics to improve implementation of the PMTCT programme for HIV-exposed children in the rural sub-district in North West Province, South Africa

Intervention strategy objectives	Functional tactics
1. To improve the knowledge, the attitude of professional nurses and practice in all healthcare facilities in North West Province	Professional nurses that provide PMTCT services should undertake training such as nurse-initiated and management of antiretroviral treatment (NIMART) course (1; 13) Orientation document to be prepared for all new staff. Quarterly in-service training to increase the manpower and foster the proper implementation of the PMTCT services. Annual seminar or workshop presentation on the trends and current PMTCT guidelines implementation (12; 14) Establishment of an inclusive forum for decision making and adoption of a democratic management style to foster professional nurses' positive attitude and accountability on the implementation of the PMTCT services (6; 15)
2. To improve mothers' role in the prevention of the spread of HIV infection to their children in all healthcare facilities in North West Province	Professional nurses should conduct a practical demonstration to mothers on how to properly breastfeed a child. This demonstration should be conducted during the antenatal and postnatal period,

Intervention strategy objectives	Functional tactics
	instead of giving a lecture during the antenatal period only (28; 34) NIMART-trained nurses should give a clear explanation and practical demonstration to mothers on how to administer a child's medicine including their own (mothers) prior to leaving the healthcare facility (27; 35; 36)
3. To improve childcare services through quick turnaround time of test results in all healthcare facilities in North West Province	A dedicated transport to collect specimen from the facility to be delivered to the laboratory on time should be prioritised and made available (16; 19) The laboratory staff should be encouraged to upload the HIV PCR test results on time to the system. Regular maintenance of telephones and computers should be prioritised to improve accessibility and obtaining the results online, communication between laboratory and healthcare staff. Laboratory staff should be encouraged to flag the HIV-positive results and communicate them to the healthcare workers at the facility urgently (3; 4; 17; 18; 25)
4. To improve human and consumable resources to adequately implement the PMTCT programme in all facilities in North West Province	Encourage management to determine the needed stock, and pre-order adequate stock supply to ensure HIV PCR test kits and medicine availability in the healthcare facility. The establishment of a system to monitor monthly stock supply should be implemented (2; 19) Management should continue to improve manpower supply by writing evidence-based motivation to the Department of Health, highlighting the negative effect

Intervention strategy objectives	Functional tactics
	staff shortages have on the professional nurses, implementation of the PMTCT programme as well as the children exposed to HIV (12; 13; 20; 22; 30; 31)
5. To build strong communication channels and awareness to disseminate adequate information from nurses to parents of children exposed to HIV in all healthcare facilities in North West Province	Establishment of communication mechanisms such as text messaging, and WhatsApp groups to reduce bureaucracy and improve communication between healthcare workers and mothers of HIV-exposed children (4; 5) Professional nurses and community health workers to promote awareness of PMTCT by disseminating adequate information about the benefits of the PMTCT programme by conducting group teaching sessions, conducting home visits, and displaying PMTCT posters on all notice boards in the healthcare facilities (11; 26; 32; 35; 40) Establishment of mother support groups that are family/partner friendly to encourage disclosure and further improve awareness and information sharing on the benefits of the PMTCT programme in all healthcare facilities (7; 9; 10; 11; 23; 24; 26; 39) Encourage a spirit of volunteerism among mothers of HIV-exposed children and then train them to facilitate the mothers' support group session to foster the involvement of people on the ground that understand the cultural context
6. To establish an efficient method to track mothers of children	The establishment of a system of doing a follow up such as text messaging between professional nurses and mothers, community health workers to conduct home

Intervention strategy objectives	Functional tactics
exposed to HIV in all healthcare facilities in North West Province	visits to prevent loss to follow up and give feedback to the professional nurses to clear any misunderstanding (20; 21) Healthcare facilities should have an effective system in place that enables clients to anonymously report improper treatment by professional nurses daily. Encourage facilitation of behaviour changes through motivation and annual award plaque for the best patient-friendly professional nurse/s (30; 27; 29) Adequate and well suitable mobile clinics for rural roads be delegated to provide PMTCT services to mothers living in the peripheral areas to improve childcare and avoid a poor return to the healthcare facility due to lack of transport and money (37; 38)
7. To improve infrastructural development for both professional nurses and mothers of HIV-exposed children in all healthcare facilities in North West Province	Encourage management to draw the Department of Health's attention and awareness by developing a position paper highlighting the shortage of infrastructure and the need for more offices, consultation rooms and space for mothers' support group meetings (8; 33)

6.6 INTERVENTION STRATEGY FORMULATION TO IMPROVE PMTCT PROGRAMME IMPLEMENTATION FOR HIV-EXPOSED CHILDREN IN THE RURAL SUB-DISTRICT IN NORTH WEST PROVINCE, SOUTH AFRICA

The following strategy was formulated based on the concluding statements as depicted in Table 6-1 of this chapter. The implementation process of the intervention strategy to improve PMTCT programme implementation can be described as being circular in nature based on the degree to which the interdependency of the activities happens as narrated below. The following is the order of circular steps of the intervention strategy formulation process:

Step 1: The vision of the intervention strategy which is "to provide a quality driven PMTCT programme to ensure a long and healthy life for all children exposed to HIV" gives rise to the mission.

Step 2: In order to achieve the mission of the intervention strategy which is to "ensure a safe, friendly environment for children exposed to HIV and their mothers through consistent application of role-related activities by the professional nurses and the health system for training activities for all professional nurses, thus improving PMTCT programme implementation" the intervention strategy stipulates upfront how it intends to achieve its vision.

Step 3: The vision and mission are driven by values and principles. That is so because individuals involved in the PMTCT programme such as professional nurses and mothers of children exposed to HIV have the values that they believe in which influence their decision making. The major common values that form the focus of this intervention strategy are:

- **Teamwork:** Teamwork allows members to develop effective and mutual relationships with other members in the PMTCT programme. Teamwork fosters a healthy formal and informal interaction in accomplishing goals through deliberate sharing of knowledge and skills among all members involved in the broader aspect of the PMTCT programme such as professional nurses at the facility and laboratory staff, counsellors, community health workers as well as mothers of children exposed to HIV.

  Respect: Respect implies that members involved in the PMTCT programme should be treated fairly and that respect should be mutual. Communication either in written or

verbal form from managers to professional nurses, healthcare workers to mothers of children exposed to HIV and among individuals should encompass respect in the healthcare facility environment. Respect as a value implies that any planning and decision-making should not be done without consultation with other team members involved in the PMTCT programme as per their different roles to ensure that the functional tactics are acceptable, particularly to those at the ground level (implementors and end users).

Step 4: The formulated principles should be respected and adhered to in order to ensure that the intervention strategy to improve PMTCT programme implementation is properly implemented. The common principles informing the intervention strategy are:

- **Democratisation**

The principles that guide the intervention strategy include the involvement of all professional nurses in the PMTCT programme and mothers of children exposed to HIV in the formulation of the intervention strategy up to the implementation stage to form a sense of ownership, accountability thus has a potential to ensure that intervention strategy functional tactics are adequately implemented.

- **Development**

Another crucial principle in this intervention strategy is that of staff development, which implies that professional nurses be allowed to undertake relevant training, and continuous in-service training pertaining to the implementation of the PMTCT programme. In addition, a conducive environment is another key principle that governs this intervention strategy; hence, infrastructure development implies that healthcare facilities where implementation of the PMTCT services are provided, should be well developed and have adequate space for offices, consultation rooms, and rooms to conduct mother support group meetings. Furthermore, the development of mothers through training in order to improve adherence remains a crucial aspect.

- **Quality**

Another essential principle that informs this intervention strategy is that healthcare facilities should provide quality evidence-based services, be gender-sensitive, culturally sensitive, and socially accountable to all actors in the health system pertaining to the implementation of the PMTCT programme. In addition, healthcare facilities must uphold high professional ethical standards through human dignity and human rights, confidentiality and be sensitive to cultural matters in their implementation of the PMTCT services.

Step 5: The goal of the intervention strategy is to improve the implementation of the PMTCT programme for HIV-exposed children in the rural sub-district in North West Province. Hence, the objectives (based on the concluding statements in Table 6-1) for reaching the stated goal are to be set as depicted in Table 6-2 of this chapter. Thus, the involvement of the implementers and end users who are at the ground level be involved from the beginning up to the end stage as they understand not only the community they serve, but also the nuisance that hinders the implementation of the PMTCT programme.

Step 6: The functional tactics are actual plans developed from the intervention strategy objectives detailing operational activities to ensure that the set goal, which is to improve PMTCT programme implementation is achieved. Thus, functional tactics must be formulated in a practical manner so that they contribute to the achievement of an ultimate set goal.

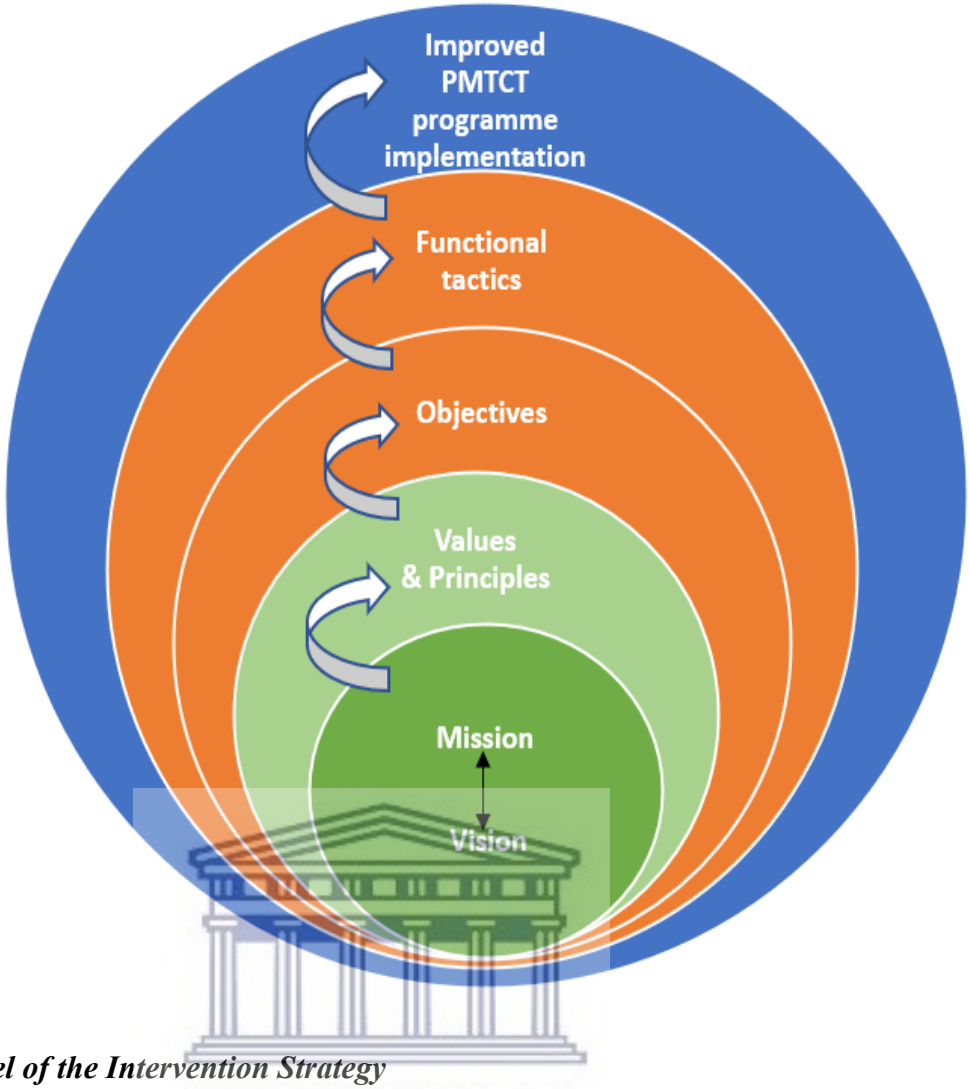

Figure 6-1: Model of the Intervention Strategy

The table below (Table 6-4), is intended to depict the summary of the entire intervention strategy to improve PMTCT programme implementation in the rural communities as the final product that could be easily pulled and shared with others and relevant stakeholders; hence it is named SB (stands for Sibusiso Buthelezi) strategy to improve PMTCT programme implementation for HIV-exposed children.

Table 6-4: SB strategy to improve PMTCT programme implementation for HIV-exposed children in the rural sub-district in North West province, South Africa

Vision	To provide a quality-driven PMTCT programme to ensure a long and healthy life for all children exposed to HIV.
Mission	To ensure a safe, friendly environment for children exposed to HIV and their mothers through consistent application of role-related activities by the professional nurses and the health system for training activities for all professional nurses, thus improving PMTCT programme implementation.
Principles	*Democratic:* Involvement of all stakeholders at all levels, Transparency, Shared responsibility to both professional nurse and end users *Development:* Relevant training for all professional nurses, Basic skill demonstration for mothers (e.g., Breastfeeding) Continuous in-service training, Adequate allocation of resources. *Quality:* Provide evidence-based services, Uphold high ethical standards through human dignity, human rights, and confidentiality. Gender and culturally sensitive. Socially accountable to all actors in the healthcare system.
Values	*Teamwork:* Knowledge and skills sharing among all role players, Good and adequate communication between all role players. *Respect:* Treat all role players involved including end users with respect. Consultation before a decision is made regarding clinical practice.
Objectives	Improve knowledge, attitude of professional nurses and practice; improve mothers' role in the prevention of the spread of HIV to their children, Improve childcare services received at the healthcare facility, improve human and consumable resources, and Build a strong communication channel and awareness to disseminate information, establish an efficient method to track mothers, and

	improve infrastructural development (e.g., office space, consultation room and group meeting rooms).
Functional tactics	NIMART training for professional nurses, quarterly in-service training, annual seminar, or workshop on PMTCT trends, inclusive forum for decision making, democratic management style to foster positive staff attitude and accountability, conduct a practical demonstration on proper breastfeeding for mothers, NIMART trained staff give clear and adequate explanation to mothers on the administration of child's medication, and practical demonstration thereof. Adequate transport to collect specimen from healthcare facility to laboratory, regular maintenance of telephones and computers must be prioritised to improve accessibility to the results and communication between professional nurses and laboratory staff; laboratory staff must be encouraged to upload HIV PCR test results on time on the system. Adequate procurement of stock supply (e.g., HIV test kits and medicine), a system to monitor stock supply must be in place, management should continue engaging the DoH regarding lack of human resources and point out its consequences using evidence, communication mechanisms such as short message service (SMS) and WhatsApp groups should be established to improve communication between healthcare staff and mothers and to improve tracking of mothers. promote awareness of PMTCT by conducting group teaching sessions, conducting home visits, and displaying PMTCT posters on all notice boards in the healthcare facilities, Establishment of mother support groups that are family/partner friendly to encourage disclosure and further improve awareness, Encourage a spirit of volunteerism to mothers of HIV-exposed children and then train them to facilitate the mothers' support group session, effective system in place that enables clients to anonymously report improper treatment by professional nurses daily. Encourage

	facilitation of behavioural changes through motivation and annual award plaque for best patient-friendly professional nurse/s, Adequate and well suitable mobile clinics for rural roads be delegated to provide PMTCT services, management to engage the DoH regarding inadequate infrastructure such as offices, consultation rooms and space for mothers' support group meetings.
Improved prevention of mother-to-child transmission programme implementation in the rural sub-district in NW province, in SA.	

6.7 CHAPTER SUMMARY

In this chapter, the researcher embarked on the process of the formulation of the intervention strategy to improve PMTCT programme implementation for HIV-exposed children in the rural sub-district in North West Province, South Africa. Furthermore, the intervention strategy process was discussed with regard to the vision, mission, values, principles, intervention strategy objectives, and functional tactics. More importantly, the intervention strategy was formulated based on the study findings from an integrative literature review and empirical data from which concluding statements were drawn as shown in Table 6-1 of this chapter. As the researcher stated at the beginning of chapter one of this study that he arises from the constructivist paradigm, it is safe to state that the information gathered and shared by the participants assisted the researcher to formulate an intervention strategy that is based on the issues raised in the study.

CHAPTER SEVEN

PHASE TWO: INTERVENTION STRATEGY DEVELOPMENT, SUMMARY, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

In the previous chapter (chapter six), the intervention strategy formulation process to improve the implementation of the PMTCT programme for HIV-exposed children in the rural sub-district in North West Province, South Africa was discussed. The focus of this final chapter is to present the summary, conclusions, limitations, and recommendations for this study. This information is considered relevant for policymakers and all other involved stakeholders in the health sector pertaining to the successful implementation of the PMTCT programme in rural areas.

7.2 SUMMARY AND CONCLUSIONS

This study aimed to develop an intervention strategy to improve the implementation of the PMTCT programme for HIV-exposed children in the rural sub-district in North West Province, South Africa. The researcher explicitly outlined the objectives of the study that are geared towards assisting in achieving the aim of the study, particularly so because the findings of the study were to be the foundation within which the intervention strategy was to be formulated.

The study was conducted following the first three steps of IR: D&D. The first two steps of IR: D&D allowed the researcher to collect existing information by means of an integrative review and empirical data by means of semi-structured interviews. The third step of IR: D&D designs, fostered the formulation of an intervention strategy based on the concluding statements from integrative literature review and empirical research data.

The theoretical framework employed in this study was the Health Policy Analysis Triangle of Buse, Mays, and Walt (2005) which was used to explore actors (Who), context (Why), process (How) and content (What), which helps to understand why policy does or does not succeed. The Health Policy Analysis Triangle is a suitable framework to explore various factors that may affect health policy and implementation thereof.

Therefore, the objectives to attain the aim of the study were:

1. To conduct an integrative literature review to explore the characteristics of different intervention strategies used to improve the implementation of health policies globally and particularly in rural areas. The focus of conducting the review was on the characteristics of strategies that have been found to be effective when it comes to successfully improving the implementation of policies and the ones that had been reported as hindrances. The concluding statements made based on the findings of this review, highlighted that to successfully improve the implementation, characteristics such as staff training, adequate resources (human and consumables), fast-tracking of results, communication, staff involvement, adequate infrastructure, awareness, and disclosure of HIV status remain imperative.

2. To explore the professional nurses' perceptions and attitudes on the PMTCT programme implementation pertaining to HIV-exposed children. It was discovered that there are still healthcare workers that lack relevant training pertaining to PMTCT programmes such as NIMART, and there is a lack of in-service training refresher programmes. There is still a lack of professional nurses' involvement in planning and decision making that affect their roles in the PMTCT services as they are often told how things should be done by people from outside who do not know and understand the context and this contributes to unpleasant attitudes when it comes to the implementation of the PMTCT services. Over and above, there is still a serious challenge of staff shortages and stock-out (HIV test kits and medicine) which compromise the adequate implementation of the PMTCT services.

3. To explore the perceptions of parents (of children exposed to HIV) on childcare received in the rural sub-district healthcare facilities. The research findings indicate a positive perception from mothers' point of view about the care their children receive and thus they recognise and value the benefit of bringing a child to the facility, particularly for childcare pertaining to the PMTCT services. However, the findings further revealed mothers' dissatisfaction with childcare received in the facility, particularly in a situation where mothers do not find the child's HIV PCR test results, and are not provided with relevant adequate information pertaining to taking care of the child. For instance, mothers are given the child's medicine including their treatment without proper explanation and advised to exclusively breastfeed without practical demonstration. Furthermore, healthcare workers' negative attitude, long

waiting times and lack of support groups for mothers of children exposed to HIV were perceived as a lack of childcare by the mothers.

4. To explore the parents' perceptions of their role in the prevention of the spread of HIV infection to their children. The study findings revealed a good commitment undertaken by the mothers to ensure that their children do not contract HIV. Mothers viewed their commitment to exclusive breastfeeding for at least a period of six months, administering child medicine on time as instructed, including taking their treatment, especially during the breastfeeding period, bringing the child for follow-up appointments and disclosure of their HIV status to families and or partners as an essential role to prevent the spread of HIV to their children. However, the lack of support and involvement from families and partners, money for transport, disclosure of HIV status, and inadequate information to assist mothers to prevent the spread of HIV to their children was found to be a serious threat pertaining to the successful implementation of the PMTCT programme.

5. Finally, conclusions were drawn, and an intervention strategy was formulated using the concluding statements from the integrative literature review and empirical data as a guide. Constructivism being the researcher's paradigm implies that the information gathered and shared by the participants assisted the researcher to formulate an intervention strategy that is based on their needs raised in the study. In conclusion, it can therefore be concluded that the aim and final objective for this research, which was to design an intervention strategy to improve PMTCT programme implementation for HIV-exposed children in the rural sub-district in North West Province, have been achieved. Thus, this study brings a unique contribution to nursing knowledge because an intervention strategy that had not been previously formulated was co-constructed by the researcher, using empirical evidence from the participants and a literature review by means of concluding statements.

7.3 LIMITATIONS OF THE STUDY

The following limitations were experienced:

- Population two of this study ended up being the biological mothers of children exposed to HIV. The opportunity to explore the perceptions of childcare and its role in preventing the spread of HIV to parents other than biological mothers, like fathers and

non-biological parents like caregivers, AIDS orphans who are also cared for by non-biological parents were missed. Therefore, the results cannot be generalised to male parents and caregivers.

- The intervention strategy was formulated using only one district in one rural province. Therefore, it will be worthwhile that in future studies, work be done in other similar provinces which show that the decrease in MTCT is not below the national average. Furthermore, this will assist in identifying the difference in those contexts despite all being classified as rural.

7.4 RECOMMENDATIONS FOR NURSING PRACTICE AND EDUCATION, AND RESEARCH

Recommendations are made for nursing practice, education, and research.

7.4.1 Recommendations for Nursing education and practice

7.4.1.1 Nursing education

- There must be a collaborative approach between Higher Education Institutions (HEI) and healthcare facilities to facilitate the relevant training for healthcare workers particularly those who are implementing the PMTCT programme. The magnitude of the impact caused by lack of adequate training must be presented at HEI/clinical meetings, where representatives from training institutions, DoH and key individuals who are responsible for decision making about healthcare workers' clinical practice matters such as skills acquisition and training will be present.

7.4.1.2 Nursing practice

- Professional nurses who have benefited from additional training such as NIMART should be encouraged to give feedback to their team/colleagues and mentor others so that they can benefit.

- Workshop/seminar on current issues pertaining to the PMTCT programme should be held as a form of refresher training where all healthcare workers should keep abreast

by highlighting the benefits of effective implementation of the PMTCT services among other matters. The updated implementation of the PMTCT guidelines version must be available in such sessions and be disseminated to all healthcare workers in attendance.

- Commitment from facility managers to promote an environment that includes all relevant role players has to be created and sustained to enable role players to feel recognised for their contribution to any planning and decision making, especially if it will affect their roles. Furthermore, adequate, and appropriate information should be provided to all mothers including demonstration of basic skills like breastfeeding in order to empower them and thus improve adherence.

- Facility managers to address infrastructural, administrative, and procurement issues which hinder the proper implementation of the PMTCT programme. Facility managers should address the above-stated issues by continuously engaging the DoH in meetings and other platforms using scientific evidence to show the negative impact caused by the stated issues in the bigger picture of achieving zero new HIV infections in children.

7.4.2 Recommendation for policy makers

- When a policy/strategy is developed, it must be a practice to involve all relevant key role players and obtain their input from the planning until the implementation stage, because the lack of involvement and buy-in of the implementers and end users cannot help to achieve the intended objectives.

7.4.3 Recommendations for further research

Further research could be done to:

- Pilot-test the formulated intervention strategy and evaluate effectiveness through post-doctoral research.

- Implement research focusing on awareness creation and utilisation of the PMTCT guidelines among mothers of children exposed to HIV in rural areas.

- Explore the perceptions of a family member, guardians, and male partners on their involvement in the PMTCT programme in rural areas.

7.5 CHAPTER SUMMARY

This final chapter provided a reflective overview of the research process including highlighting the purpose of the research and how the objectives were achieved. It further outlined the limitations of the study, and recommendations for potential research were made for nursing practice and education as well as nursing research.

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APPENDIX 1: UNIVERSITY OF THE WESTERN CAPE ETHICS

CERTIFICATE

OFFICE OF THE DIRECTOR: RESEARCH
RESEARCH AND INNOVATION DIVISION

Appendix 1A

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South Africa
T: +27 21 959 4111/2948
F: +27 21 959 3170
E: research-ethics@uwc.ac.za
www.uwc.ac.za

12 September 2018

Mr SF Buthelezi
School of Nurisng
Faculty of Community and Health Science

Ethics Reference Number: BM18/6/29

Project Title: Intervention strategy to improve PMTCT policy implementation for HIV exposed children in a rural sub-district in North West Province

Approval Period: 112 September 2018 - 12 September 2019

I hereby certify that the Biomedical Science Research Ethics Committee of the University of the Western Cape approved the scientific methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report in good time for annual renewal.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

PROVISIONAL REC NUMBER -130416-050

UNIVERSITY of the WESTERN CAPE

60 YEARS of hope, action & knowledge

27 March 2020

Mr SF Buthelezi
School of Public Nursing
Faculty of Community and Health Sciences

Ethics Reference Number:	BM18/6/29
Project Title:	Intervention strategy to improve PMTCT policy implementation for HIV exposed children in a rural sub-district in North West Province.
Approval Period:	13 March 2020 – 13 March 2023

I hereby certify that the Biomedical Science Research Ethics Committee of the University of the Western Cape approved the scientific methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report annually by 30 November for the duration of the project.

Permission to conduct the study must be submitted to BMREC for record-keeping.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Director: Research Development
University of the Western Cape
Private Bag X 17
Bellville 7535
Republic of South Africa
Tel: +27 21 959 4111
Email: research-ethics@uwc.ac.za

NHREC Registration Number: BMREC-130416-050

APPENDIX 2: NORTH WEST DEPARTMENT OF HEALTH PERMISSION

health
Department of
Health
North West Province
REPUBLIC OF SOUTH AFRICA

3801 First Street
New Office Park
MAHIKENG, 2735

Enq: Nthabiseng Mapogo
Tel: 018 391 4504
NMapogo@nwpg.gov.za
www.nwhealth.gov.za

POLICY, PLANNING, RESEARCH, MONITORING AND EVALUATION

Name of researcher : Dr. C. Miruka
Walter Sisulu University

Physical Address _____
(Work/ Institution) _____
_____

Subject : Research Approval Letter- Intervention strategies to improve the implementation of policies pertaining to paediatric TB, HIV and AIDS in the rural health care facilities in Eastern Cape and North West Provinces.

This letter serves to inform the Researcher that permission to undertake the above mentioned study has been granted by the North West Department of Health. The Researcher is expected to arrange in advance with the chosen facilities, and issue this letter as proof that permission has been granted by the Provincial office.

This letter of permission should be signed and a copy returned to the department. By signing, the Researcher agrees, binds him/herself and undertakes to furnish the Department with an electronic copy of the final research report. Alternatively, the Researcher can also provide the Department with electronic summary highlighting recommendations that will assist the department in its planning to improve some of its services where possible. Through this the Researcher will not only contribute to the academic body of knowledge but also contributes towards the bettering of health care services and thus the overall health of citizens in the North West Province.

Kindest regards

LEPAPHA LA BOITEKANELO
DEPARTMENT OF HEALTH
Kgetsana Poso 7/Private Bag X2068
Mmabatho,2735
13 JAN 2017
NORTH WEST PROVINCE
REPUBLIC OF SOUTH AFRICA

Dr. FRM Reichel
Director: PPRM&E

12/01/2017
Date

Researcher

Date

1

Healthy Living for All

APPENDIX 3: FACILITY PERMISSION

health
Department of
Health
North West Province
REPUBLIC OF SOUTH AFRICA

Montshioa Stadt CHC
Next to Barolong Bo
Ratshidi Hall
Mahikeng
2745 Tel: 0183846457

2030 NDP

MONTSHIOA STADT CHC

University of the Western Cape

PRIVATE BAG x17

BELLVILLE

7535

Dear Sibusiso Buthelezi

Re: Intervention strategy to improve PMTCT policy implementation for HIV exposed children in a rural sub-district in Northwest Province

This is to confirm that permission has been granted to conduct the research.

Thank you

M.I GOPANE
Operational Manager- 0183846457

G R DAKADA
Acting Operational Manager - 0725363724

Date: 25/01/2019

DEPARTMENT OF HEALTH
MAHIKENG SUB-DISTRICT
MONTSHIOA STADT CHC
25 JAN 2019
PRIVATE BAG X127, MMABATHO, 2735
NORTH WEST PROVINCE

Healthy Living for All

1

APPENDIX 4: THE INFORMATION SHEET FOR PROFESSIONAL NURSES

(ENGLISH VERSION)

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959 2271 Fax: 27 21-959 2274

E-mail: Sibusisobuthelezi08@gmail.com

INFORMATION SHEET FOR NURSES

Project Title: Intervention strategy to improve implementation of the PMTCT programme for HIV exposed children in a rural sub-district in North West Province

What is this study about?

This is a research project being conducted by Sibusiso Buthelezi who is a PhD candidate at the University of the Western Cape. We are inviting you to participate in this research project because you are a nurse providing care to HIV exposed infants, guided by the prevention of mother to child transmission (PMTCT) policy. The purpose of this research project is to design an intervention strategy to improve PMTCT policy implementation for HIV exposed children in rural areas. Hence, your experience and input will be of great value to the achievement of the aim of this study, and consequently, improve the lives of HIV exposed children in the rural sub-district in North West province.

What will I be asked to do if I agree to participate?

You will be asked to answer the questions pertaining to the care you provide to HIV exposed babies policy in your health care facility in relation to the PMTCT policy. You will also be

asked about your understanding of the content of the PMTCT policy. The interviews will last between 45-60 minutes.

Would my participation in this study be kept confidential?

The researchers undertake to protect your identity and the nature of your contribution. To ensure your anonymity, the researcher will ensure that the information discussed with you is not identifiable at all. Hence your name will not be mentioned during the interview. Instead codes will be used in all the documentation and reports emanating from this study. If there are any real names mentioned during interview process, the researcher will replace those names with codes when transcribing data. The codes such as NWM1 will be used instead of real names.

To ensure your confidentiality, your identity will be limited to the researcher and his team only. The researcher will reiterate the importance of confidentiality to the research team. The researcher will audio-record the interview so that there will be no information that will be missed during the interview. These files of data will be locked in a cabinet which will be accessed by the research team only. The transcripts from the audio-recordings will be saved in password protected file on the computer only accessible to the researcher. All the data files will be kept for five years and then destroyed. Your identification will not be divulged in any report or article that will be written from this study.

What are the risks of this research?

There may be some risks from participating in this research study, such as getting emotional because of the information that you will be sharing with the researcher.

All human interactions and talking about self or others carry some amount of risks. The researcher will nevertheless minimise such risks and act promptly to assist you if you experience any discomfort, psychological or otherwise during the process of your participation in this study. Where necessary, an appropriate referral will be made to a suitable professional such as a psychologist for further assistance or intervention.

What are the benefits of this research?

This research is not designed to benefit you personally, but the results may help the researcher to learn more about the challenges faced by nurses and parents or caregivers of HIV exposed children in Mahikeng sub-district in Northwest province. We hope that, in the future, other children might benefit from this study through a new intervention which would have been

designed to improved implementation of the PMTCT policy in relation to HIV exposed children.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

What if I have questions?

This research is being conducted by Sibusiso Buthelezi at the University of the Western Cape. If you have any questions about the research study itself, please contact Sibusiso Buthelezi at: sibusisobuthelezi08@gmail.com Tel: 021 4066704

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Professor Jennifer Chipps
Head of Department: e.g. School of Nursing
University of the Western Cape
Private Bag X17
Bellville 7535
jchipps@uwc.ac.za

Professor A. Rhoda
Dean of the Faculty of Community and Health Sciences
University of the Western Cape
Private Bag X17
Bellville 7535
chs-deansoffice@uwc.ac.za

APPENDIX 5: INFORMATION SHEET FOR PARENTS

APPENDIX 5A: English version

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959 2271 Fax: 27 21-959 2274

E-mail: Sibusisobuthelezi08@gmail.com

INFORMATION SHEET FOR PARENTS (English version)

Project Title: Intervention strategy to improve implementation of the PMTCT programme for HIV-exposed children in a rural sub-district in North West Province

What is this study about?

This is a research project being conducted by Sibusiso Buthelezi who is a PhD candidate at the University of the Western Cape. We are inviting you to participate in this research project because you are a parent/caregiver of a child that is exposed to HIV and receiving treatment at public health facilities in Mahikeng district. Therefore, your experience and input will be of great value to the achievement of the aim of this study.

The purpose of this research project is to design an intervention strategy to improve PMTCT programme implementation for HIV-exposed children in rural areas. Hence, your experience and input will be of great value to the achievement of the aim of this study, and consequently, improve the lives of HIV-exposed children in the rural sub-district in North West province.

What will I be asked to do if I agree to participate?

You will be asked questions about your perception on the care received by the child in the health care facilities. You will be asked about the role you play as a parent/caregiver to protect the baby from getting infected by HIV. The interviews will last between 45-60 minutes. The

questions that would be asked in this interview are pertaining to PMTCT programme and HIV-exposed children.

Would my participation in this study be kept confidential?

The researchers undertake to protect your identity and the nature of your contribution. To ensure your anonymity, the researcher will ensure that the information discussed with you is not identifiable at all. Hence your name will not be mentioned during the interview. Instead codes will be used in all the documentation and reports emanating from this study. If there are any real names mentioned during interview process, the researcher will replace those names with codes when transcribing data. The codes such as NWM1will be used instead of real names.

To ensure your confidentiality, your identity will be limited to the researcher and his team only. The researcher will reiterate the importance of confidentiality to the research team. The researcher will audio-record the interview so that there will be no information that will be missed during the interview. The transcripts from the audio-recordings will be saved in a password protected computer file that is only accessible to the researcher and his team. All the other collected data (hard copies) will be kept in a locked cabinet for the duration of five years and then destroyed. Your identification will not be divulged in any report or article that will be written from this study.

What are the risks of this research?

There may be some risks from participating in this research study, such as getting emotional because of the information that you will be sharing with the researcher.

All human interactions and talking about self or others carry some amount of risks. The researcher will nevertheless minimise such risks and act promptly to assist you if you experience any discomfort, psychological or otherwise during the process of your participation in this study. Where necessary, an appropriate referral will be made to a suitable professional for further assistance or intervention.

What are the benefits of this research?

This research is not designed to help you personally, but the results may help the researcher to learn more about the challenges faced by HIV-exposed children in the rural areas of Mahikeng

sub-district in Northwest province. We hope that, in the future, other children might benefit from this study through a new intervention which would have been designed to improved PMTCT policy implementation in HIV-exposed children.

Do I have to be in this research, and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

What if I have questions?

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Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

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APPENDIX 5B: Setswana version

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LENANEO LA DIKITSISO LA BATSADI (Setswana version)

Leina la Projeke: Intervention strategy to improve implementation of the PMTCT programme for HIV-exposed children in a rural sub-district in North West Province

Ke thuto ee e mabapi le eng?

E ke projeke ya dipatlisiso e e diriwang ke Sibusiso Buthelezi o eleng morutwana wa lekwalo la PhD ko Universiting ya Kapa Bophirima. Re a golaletsa gore o tseye karolo mo projekeng kantlha ya gore o le motsadi kgotsa motlhokomedi yo o tlhokomelang go bana ba ba mo mpananeng ya kokwana ya HIV, mo tlase ga kaela ya molawana wa thibelelo ya tshwaetso gotswa go mme go ya ngwaneng (PMTCT). Maitlhomo a projeke e ya dipatlisiso ke go thadisa leano la dikgato tse di tla natlafatsang molawana wa PMTCT go bana ba ba mo mpananeng ya kokwana ya HIV mo metseng magae. Ka goo, maitemogelo a gago le ditshwaelo tsa gago di tla nna tsa boleng jo bogolo thata mo katlegong ya maikaelelo a thuto patlisiso e. Maduo a gone a tla bonwa mo natlafalong ya matshelo a bana ba ba mo mpananeng ya kokwana ya HIV ko kgaolong ya motse magaeng kwa Porofinsing ya Bokone Bophirima.

Ke tla tshwanela gore ke dire eng ga nka dumela go tsaya karolo?

O tla kopiwa go araba dipotso tse di amanang le kelotlhoko ya gago mabapi le tlhokomelo e e filweng ngwana ko mafelong a pholo. O tla kopiwa go tlhalosa kabelo e o e tshamekang jaaka motsadi kgotsa motlhokomedi go sireletsa lesea kgatlanong le tshwaetso ya mogare wa HIV. Dipotsolotso di tla tsaya metsotso e e magareng ga 45 – 60.

A go tsaya karolo ga me go tla nna sephiri?

Mmatlisisi o tshepisa go sireletsa boitshupo jwa gago le mokgwa wa kitso moneelo wa gago. Go tlhotlhomatsa go sa itsiweng ga gago, mmatlisisi o tla tlhotlhomatsa gore tshedimosetso eo e neetseng ga e kgone go ka lemogwa ke ope. Ka goo, leina la gago ga le kitla le tlhagelela mo dipotsolotsong. Go na le moo, go tla dirisiwa mokwalo o o fitlhegileng mo ditlankaneng le dipegong tsotlhe tse di ka kwalwang gotswa mo dipatlisisong tse. Ga maina a nnete a ka tlhagelela ka nako ya dipotsolotso, mmatlisisi o tla a phimola mme a dirisa mokwalo o o fitlegileng mo maemong a one. Mekwalo e tshwana le NWM1 a tla dirisiwa mo boemong juwa maina a nnete.

Go netefatsa khupamarama, boitshupo jwa gago go tla itsiwe ke mmatlisisi le badira kaene fela. Mmatlisisis o tla gatelela botlhokwa jwa khupamarama go badira ka ene. Mmatlisisi o tla gatisa dipotsolotso gore go se nne le tshedimosetso e e tla latlhegang ka nako ya dipotsolotso. Dikgapetlana tsa tshedimosetso di tla lotlelelwa mo kabineteng e eleng mmatlisisi le badira ka ene fela b aba nang le tetla mo go yona. Dipuo tse digatisitsweng di tla bolokiwa mo kompuitareng e e nang le nomoro ya sephiri e e itsiweng ke mmatlisisi a le nosi. Dibukana tsotlhe tsa tshedimosetso di tla bolokiwa dingwaga di le tlhano mme morago tsa senngwa. Booitshupo jwa gago ga bo kitla bo ntshiwa mo pontsheng ga gokwalwa di pegelo kampo ditlhogo gotswa mo dipatlisisong tse.

Ke dikotsi dife tse di ka diragalang kantlha ya dipatlisiso tse?

Go ka nna le dokotsi dingwe ka ntlha ya go tsaya karolo mo dipatlisisong tse, jaaka go kopana maikutlo ka ntlha ya tshedimosetso e o e fang mmatlisisi.

Ditirisano tsotlhe tsa batho le gobua ka ga gago kampo mongwe, go na le bokgoni bo borileng ba go ka tlisa dikotsi. Mmatlisisi o tla leka ka bojotlhe fo fokotsa dikotsi ebile o ka direla ka bonako go go thusa ga o ka se ikutlwe monate, mo maikutlong, mokakanyong kgotsa gongwe mo mmeleng ka nako e o tseyang karolo mo dipatlisisong. Mo go tlhokegang, o tla romelwa ko moitsanapeng wa porofeshene o o maleba (jaaka Psychologist) go bona thuso e e tshwanetseng.

Ke mesola efe e ke tla e bonang kantlha ya go tsaya karolo mo dipatlisisong tse?

Dipatlisiso tse ga di a direlwa go ka lebisa mesola ko go wena ka sewena, mme dipholo tse ditswang mo tshedimosetsong ya gago, di ka thusa mmatlisisi go ithuta ka mathata a baoki le batsadi gongwe batlhokomedi ba bana ba ba mo mpananeng ya kokwana ya HIV ba kopanang le one mo kgaolong ya Mahikeng, e e mo porofinsing ya Bokone Bophirima. Re tshepa gore mo nakong e e tlang, bana ba bangwe ba ka bona mesola go tswa mo dipatlisisong tse maikaelelo a teng e le go thadisa leano la dikgato tse di tla natlafatsang tiragatso ya molawana wa PMTCT e e amanag le bana ba ba mo mpananeng ya kokwana ya HIV.

A ke matshwanedi gore kenne modipatlisisong, ebile a nka kgaotsa go tsaya karolo nako ngwe le ngwe?

Go tsaya karolo ga gago modipatlisisong tse go tswa mo go ithaopeng ga gago. O kanna wa se dumele go tsaya karolo. Ga o tseile tshwetso ya go tsaya karolo, o ka nna wa tlogela nako ngwe le ngwe e o batlang. Ga o swetsa go se tseye karolo kgotsa o swetsa go tlogela mo gare ga nako, ga o kitla o otlhaiwa kgotsa wa latlhegelwa ke mesola e e go tshwanetseng.

Jaanong ga ken a le dipotso?

Dipatlisiso tse di diriwa ke Sibusiso Buthelezi go tswa kwa University ya Kapa Bophirima. Ga o na le dipotso mabapi le dipatlisiso ka botsona, tswetswe golagana le: Sibusiso Buthelezi at: sibusisobuthelezi08@gmail.com Tel: 021 4066704

Ga o kanna le dipotso mabapi le dipatlisiso kgotsa ditshwanelo tsa gago jaaka motsaya karolo mo dipatlisisong, kgotsa o batla go bega mathata mangwe a o nnileng le ona ka nako ya dipatlisiso, tswetswe golagana le:

Moporofesara Jennifer Chipps
Head of Department: e.g. School of Nursing
University of the Western Cape
Private Bag X17
Bellville 7535
jchipps@uwc.ac.za

Moporefesara A. Rhoda
Dean of the Faculty of Community and Health Sciences
University of the Western Cape
Private Bag X17
Bellville 7535
chs-deansoffice@uwc.ac.za

APPENDIX 6: SEMI-STRUCTURED INTERVIEW GUIDE FOR NURSES

A. General Information

Date of interview…….

Time: Start……. End……

Interviewee number……...

Interviewee`s Age……. Gender…….

Place of interview…….

Rank/Position of interviewee…….

Name of facility…….

How many years have you being practicing as a nurse/midwife?.....

How long have you been working in this health care facility? …….

Do you have qualification in PMTCT? ……. Or

Have you attended training on PMTCT? ……, if so, when?.....

B. Questions

Nurses:

What are your perceptions of PMTCT services offered in your work place?

Possible probes

Why do you hold such views?

What is your understanding of PMTCT guidelines process?

Possible probes

What are the key factors that you need to adhere to in relation to children exposed to HIV?

How do you handle the transfer of children to/ from your facility to ensure continuity of care?

How do you feel about the role you play in implementing PMTCT guidelines?

Would you like you change it and why?

Is it possible to improve how you are implementing the policy? Why? How?

The researcher will ask numerous appropriate probing questions to elicit in-depth information from the participants.

APPENDIX 7: SEMI-STRUCTURED INTERVIEW GUIDE FOR PARENTS

(English version)

A. General Information

Date of interview……..

Time: Start……. End……

Interviewee number……...

Interviewee`s Age……. Gender…….

Place of interview…….

Role of interviewee in a child`s life…….

Child`s gender……. Age……Child`s HIV status……..

How many years have you been accessing health care for your child in any health facility?

.....

Name of facility……..

B. Questions

Parents/caregivers:

Q1: What are your perceptions about the care your child is receiving in the health care facility?

Possible probes

Probe: Why do so say that?

Probe: How is that affecting your accessing of the health facility?

Q2: What is your understanding of PMTCT processes?

Possible probes

What is it that is done? What are you supposed to do? What is your responsibilities?

Can you explain more?

Q3: What is the role that you play to prevent the spread of HIV infection to your child?

Possible probe: How can you improve that?

The researcher will ask numerous appropriate probing questions to elicit in-depth information from the participants.

Thank you

APPENDIX 8: SEMI-STRUCTURED INTERVIEW GUIDE FOR PARENTS

(Setswana version)

A. Kitso kakaretso

Letlha la dipuisano……..

Nako: Tshimologo……. Pheletso……

Nomoro ya motsaya karolo……...

Dingwaga tsa motsaya karolo……. Bong…….

Lefelo la dipotsolotso…….

Karolo ya motsaya karolo mo botshelong jwa ngwana…….

Bong ba ngwana……Dingwaga……

Maemo a ngwana maleba le twatsi ya HIV……..

Ke nako e kae o tsamaisa ngwana go bona pholo kwa mafelong a pholo? …..

Leina/ Maina a mafelo a pholo……..

B. **Dipotsa tsa dipatlisiso**

Motsadi/ Motlhokomedi:

Potso 1. Di kakanyo tsa gago ke eng maelana le tlhokomelo e ngwana wa gago kgotsa yo o motlhokomelang a e bonang mo mafelong a pholo?

Dipotso teng teng

Goreng o re jalo?

Go go ama tiriso ya gago ya lefelo la pholo jang?

Potso 2: O tlhaloganya eng ka thibelelo ya tshwaetso ya mme go ngwana?

Dipotso teng teng

Go diriwa jang? O tshwanetse go dira eng? Maikarabelo a gago ke eng?

A o ka tlhalosa go fetelela?

Potso 3

O tshamela karolo efe go thibela gore ngwana wag ago/ o motlhokomel0ng ya gago a seke a tsenwa ke mogare wa HIV?

Potso teng teng: O ka tokafatsa seo jang?

Mmatlisisi o tla botsa dipotso tse dimmalwa go bona tshedimosetso ka botlalo.

Ke a leboga.

APPENDIX 9: CONSENT FORM FOR PROFESSIONAL NURSES

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E-mail: Sibusisobuthelezi08@gmail.com

CONSENT FORM FOR NURSES

Title of Research Project: Intervention strategy to improve implementation of the PMTCT programme for HIV-exposed children in the rural sub-district in North West Province

The study has been described to me in language that I understand. My questions about the study have been answered. I understand what my participation will involve audio-recording and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits.

Participant`s name……..

Participant`s signature……..

Witness……

Date……..

APPENDIX 10: CONSENT FORM FOR PARENTS (English version)

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CONSENT FORM FOR PARENTS (English version)

Title of Research Project: Intervention strategy to improve implementation of the PMTCT programme for HIV-exposed children in the rural sub-district in North West Province

The study has been described to me in a language that I understand. My questions about the study have been answered. I understand that my participation will involve audio-recording and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits that I qualify for.

Participant`s name……

Participant`s signature……

Witness……..

Date……...

APPENDIX 11: CONSENT FORM FOR PARENTS (Setswana version)

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FOROMO YA TETLA YA BATSADI (Setswana version)

Title of Research Project: Intervention strategy to improve implementation of the PMTCT programme for HIV-exposed children in a rural sub-district in North West Province

Ketlhaloseditswe diteng tsa dipatlisiso ka loleme le ke le tlhaloganyang. Dipotso tsa me mabapi le dipatlisiso di a rabilwe. Ke tlhaloganya gore botsaya karolo jwa me bo tsenya kgatiso ya mantswe, ebile ke dumela go tsaya karolo ka go rata game ebile ke sa patelediwe. Ke tlhaloganya gore boitshupo jwame ka nkitla bo phasaladiwa gope. Ke tlhaloganya gore nka tlogela go tsaya karolo nako ngwe le ngwe e ke e batlang, kwantle ga go fa mabaka Ie go tshaba ditlamorago tse di seng monate kgotsa go timiwa mesola e e ntshwanetseng.

Leina la motsaya karolo……

Tshaeno ya motsaya karolo……

Paki……..

Letlha……...

APPENDIX 12: EDITING DECLARATION

05 November 2022

DECLARATION OF PROFESSIONAL EDIT

I declare that I have edited and proofread the Doctoral Thesis entitled: **INTERVENTION STRATEGY TO IMPROVE PMTCT PROGRAMME IMPLEMENTATION FOR HIV-EXPOSED CHILDREN IN A RURAL SUB-DISTRICT IN NORTH WEST PROVINCE by Sibusiso Fortune Buthelezi .**

My involvement was restricted to language editing: contextual spelling, grammar, punctuation, unclear antecedent, wordiness, vocabulary enhancement, sentence structure and style, proofreading, sentence completeness, sentence rewriting, consistency, referencing style, editing of headings and captions. I did not do structural re-writing of the content. Kindly note that the manuscript was formatted as per agreement with the client.

No responsibility is taken for any occurrences of plagiarism, which may not be obvious to the editor. The client is responsible for ensuring that all sources are listed in the reference list/bibliography. The editor is not accountable for any changes made to this document by the author or any other party subsequent to my edit. The client is responsible for the quality and accuracy of the final submission/publication.

Sincerely,

MA Communication Science [Cum Laude]

BA Honours Communication Science

BA Humanities

Professional EDITORS Guild

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