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Title:

**Conceptual framework for strengthening
nurse-initiated management of ART
training and implementation in the North
West Province**

SH Mboweni **Orcid.org 0000-000-3112 48370**

Thesis/Dissertation/Mini-dissertation submitted in partial
fulfilment of the requirements for the degree **Doctor of
philosophy in Nursing** at the Potchefstroom Campus of
the North West University

Supervisor/Promoter:

Prof L Makhado

Graduation: May 2018

Student number: 27764400

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THESIS OUTLINE

This thesis on Conceptual Framework for Strengthening Nurse-Initiated Management of ART Training and Implementation in North West Province is presented in Article format. The PhD Candidate, Sheillah Hlamalani Mboweni, conducted the research and wrote the manuscripts. Prof Lufuno Makhado acted as the promoter and critical reviewer in the research process. The thesis is presented in the following sequence.

SECTION ONE: Overview of the study

SECTION TWO: Manuscripts

Manuscript one: NIMART training and Implementation: Systematic literature review (Submitted for publication to *Curationis Journal*)

Manuscript two: Impact of NIMART training on HIV management (submitted to *International Journal of African Nursing Sciences*)

Manuscript three: Challenges regarding NIMART training implementation management (To be submitted to *Science Direct Journal*)

Manuscript four: Conceptual framework to strengthen NIMART training and Implementation management (To be submitted to *International Journal of African Nursing Sciences*)

SECTION THREE: Conclusions, Limitations and Recommendations

DECLARARTION

I, SHEILLAH HLAMALANI MBOWENI, hereby declare that this thesis titled **“Conceptual framework for strengthening nurse-initiated management of ART training and implementation in North West Province”** which I submit for the degree of Doctor of Philosophy in the School of Nursing Sciences (SONS), Faculty of Health Sciences, North-West University, is my own original work and that all the sources and references used herein have been acknowledged accordingly.



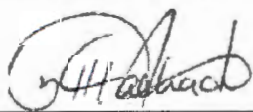
Signature

09 April 2018

Date

S.H. Mboweni (PhD Candidate)

This thesis on **Conceptual Framework for Strengthening Nurse-Initiated Management of ART Training and Implementation in North West Province** has been read and approved for submission in article format at the Mafikeng Campus of the North-West University by:



Prof L Makhado (Promoter)

09 April 2018

Date

ACKNOWLEDGEMENTS

Conducting a study and writing a significant scientific thesis is hard work and it would be impossible without the support from various people. First of all, I wish to thank the almighty God for the strength and courage to conduct the study. I wish to express my greatest appreciation towards my promoter Professor Lufuno Makhado, for the support and advices provided to me throughout the study. The thesis would not have been written successfully without your continuous coaching and mentoring.

I would like to thank the NWU ethics committee for granting approval and fellowship support including the NW Department of health for the permission to conduct the study.

My special appreciation to NIMART nurses and programme managers' who participated in the study.

I would like to express my appreciation to my husband, Mr Marvellous Mboweni; my children Tlangelani, Masingita, Xihlamariso for their emotional, financial support and providing a lovely environment for me to study.

Last but not least, A special thanks to my parents, Ms Dinah Ida Masingi and Mr Phineas Mafemani Masingi; my siblings, Ms Tintswalo Manganyi and Ms Thandi Valoyi for supporting my dream.

ABSTRACT

Background: The implementation of NIMART or HIV management training is a challenge in the PHC, after the adoption of task shifting. It is evident from the literature reviewed and the data obtained from the North West Province in South Africa in the HAST report that gaps still exist. There is no conceptual framework that provides guidance and strengthens implementation of NIMART. Therefore the researcher identified a need to develop such a conceptual framework.

Aim: This thesis seeks to conceptualise the study findings to develop and describe a conceptual framework that provides guidance and strengthens NIMART training and implementation in order to improve patient and HIV programme outcomes in the NW province. This was achieved through four manuscripts as indicated in the outline of the thesis (see Page ii)

Method: An explanatory sequential mixed method research strategy (QUAN-qual) was followed. A descriptive and explorative programme evaluation design was used and data collected from two sources DHIS, Tier.net of n=10 PHC facilities to determine the impact of NIMART on the HIV programme and five FGDs n=28 conducted from NIMART nurses and programme managers directly involved in the management of HIV and TB programme until data saturation.

Results: The study revealed that there is low ART initiation as compared to the number of clients who tested HIV positive, especially amongst children and ANC pregnant women. There is poor monitoring of patients on ART, evident in the low viral load collection and suppression, fluctuating TROA, high LTFU and deaths related to HIV. Challenges exist and this was confirmed by the qualitative findings, including health care organisation, patient, human resource ratios, training and mentoring and the absence of a conceptual framework that guides NIMART training and implementation.

Conclusion: The study findings were conceptualised to develop and describe a framework needed to facilitate and influence NIMART training and implementation in order to improve the HIV programme and patient outcomes. Dickoff, James and Wiedenbach practice-orientated theory and Donabedian's SPO model provided a starting point in the ultimate development of the framework. The conceptual framework was developed to strengthen NIMART training and implementation in the North West Province.

KEY WORDS: NIMART training, HIV programme, NIMART nurse, ART, PHC, NIMART implementation.

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LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	ACQUIRED IMMUNE DEFICIENCY SYNDROME
ANC	ANTENATAL CARE
ART	ANTI RETROVIRAL THERAPY
CD 4	CLUSTER OF DIFFERENTIATION 4
CF	CONCEPTUAL FRAMEWORK
CPD	CONTINUOUS PROFESSIONAL DEVELOPMENT
DCST	DISTRICT CLINICAL SPECIALIST TEAM
DHS	DISTRICT HEALTH SYSTEM
DHIS	DISTRICT HEALTH INFORMATION SYSTEM
FDG	FOCUS GROUP DISCUSSIONS
HAST	HUMAN IMMUNODEFICIENCY VIRUS/ACQUIRED IMMUNODEFICIENCY DEFICIENCY SYNDROME, SEXUALLY TRANSMITTED INFECTIONS and TUBERCULOSIS
HEI	HIGHER EDUCATION INSTITUTIONS
HIV	HUMAN IMMUNODEFICIENCY VIRUS
HTS	HIV COUNSELLING AND TESTING SERVICES
IMCI	INTEGRATED MANAGEMENT OF CHILDHOOD ILLNESS
LTFU	LOSS TO FOLLOW UP
NDOH	NATIONAL DEPARTMENT OF HEALTH

NIMART	NURSE INITIATED MANAGEMENT of ANTI RETROVIRAL THERAPY
NMMD	NGAKA MODIRI MOLEMA DISTRICT
NWP	NORTH WEST PROVINCE
NWU	NORTH-WEST UNIVERSITY
PHC	PRIMARY HEALTH CARE
PN	PROFESSIONAL NURSES
PMTCT	PREVENTION OF MOTHER TO CHILD TRANSMISSION
QUARI	QUALITY ASSESSMENT RESEARCH INSTRUMENT
QUAN-qual	SEQUENTIAL QUANTITATIVE MIXED METHOD
RTC	REGIONAL TRAINING CENTRE
SPO	STRUCTURE, PROCESS AND OUTCOMES
TB	TUBERCULOSIS
TIER.NET	THREE INTERLINKED ELECTRONIC REGISTER FOR TB & HIV
TROA	TOTAL PATIENTS REMAINING ON ART
UTT	UNIVERSAL TEST AND TREAT
VL	VIRAL LOAD
VLC	VIRAL LOAD COLLECTION
VLS	VIRAL LOAD SUPPRESSION
WHO	WORLD HEALTH ORGANIZATION

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SECTION 1: OVERVIEW OF THE STUDY

1. INTRODUCTION AND BACKGROUND

The dual burden of Human Immunodeficiency virus (HIV) and Tuberculosis (TB) is a global concern and demands for Antiretroviral Therapy (ART) initiation to manage and control the dual epidemic as well as a Prevention of Mother to Child transmission (PMTCT). According to WHO (2013: 10), there are approximately 36.9 million People Living with HIV (PLWH) worldwide, of which 16.8 million are women, 3.4 million children and adolescents less than 15 years old and 1.8 million deaths related to Acquire Immune Deficiency Syndrome (AIDS) have been reported. The Sub-Saharan region is the worst affected with 25.8 million that account for 70% of HIV cases globally and 1.2 million deaths. With these figures, South Africa reported the largest population of PLWH at 6.4 million, 340 000 new HIV infections and 200 000 AIDS related deaths. South Africa also ranked the third highest burden in TB in the world in 2013 (UNAIDS 2014: 9). The increasing number of PLWH in need of ART exerts excessive pressure on the health care system that is already experiencing a dire shortage of resources and high staff turnover (Ousman et al 2016:332). According to Simelela and Venter (2014:7), shifting of tasks was adopted in South Africa and training on nurse-initiated management of ART (NIMART) was introduced in 2009 to improve access to ART. The researcher envisaged to investigate the impact of the NIMART training on HIV management and to develop

a conceptual model that could strengthen training strategies and implementation in South Africa.

According to WHO (2012:11), the prevalence of HIV remains high at 19.1% among the general population and very high in key populations globally, although there has been a slight decline by 0.8% since 2000 from 38.1 million to 36.9 million in 2014. Only 37% of adults and 24% of children living with HIV received ART worldwide. Consequently, the prevalence of TB/HIV co-infected cases is also increasing, adding to the burden already witnessed in the management of HIV and TB. In 2012 there were 9.6 million new TB cases of which 1.2 million were among PLWH globally. In Sub-Saharan Africa, PLWH who know their status are at 45%, those receiving ART 39% and with suppressed viral load stand at 29% and this raises much concern with regard to HIV management (UNAIDS 2014:24). In South Africa, HIV prevalence in the general population is still increasing at 6 595 232 with only about half of that number initiated on ARV, thus 3 103 902 9 (47.1%) PLWH on ART, although there is a decline among children due to the PMTCT programme that has reduced mortality by 20%. The life expectancy at birth is still below the global and national target of 70%, with females at 64.3% and males at 60.6 % (Day & Gray 2015: 211).

According to Day and Gray (2015: 231) and NWPoH (2016: 31), the prevalence of HIV in the NW province has declined slightly by 0.8% from 30.0% in 2011 to 28.2%. However, this decline does not show any impact as the life expectancy at birth is below 70%, males at 49.9% and females at 54.3%. Deaths related to HIV still remains

the number one cause at 4.8% and there is the unrelenting incidence of Pulmonary TB (PTB) in PLWH infection which is increasing while ART initiation and the number of PLWH remaining on ART is decreasing.

The increasing number of PLWH and demand for ART have a serious impact on the South African health care system that is already experiencing a dire shortage of human, financial and material resources and poor infrastructure (Sifanelo & Theron 2012:5; WHO 2007:9). The increased workload frustrates nurses, leading to stress, burnout, negative attitudes and high staff turnover (Davies, Homfray & Venables 2013: 3; Cameron et al 2012: 99). Studies conducted by Munsamy and Botha (2014: 92), Green et al (2014:7) and George et al (2012: 99) confirm that there is an inadequate and poorly maintained infrastructure which can no longer accommodate patients from the cohort of PLWH and the stretched services that have to be rendered. Overcrowding results in long waiting times and exposes staff and clients to the risk of cross infection. Privacy and confidentiality are highly compromised and negatively affected. Such compromises extend into a decline in the quality of counselling services, including disclosure, open sharing and discussion of problems affecting PLWH.

The demands for HIV and TB services carry significantly high financial implications in the South African health system, as the bulk of the budget is allocated to HIV and TB programmes, to procure ARVs, TB and other drugs for the management of OIs and side effects (Day & Gray 2015:293). The leading causes of premature mortality in

South Africa remain HIV/AIDS at 30.5 % and the leading risk is unsafe sex followed by lower respiratory infections and TB. The high death rate among the youth, 14-34 years, also affects the socio-economic status and demographic distribution of the country (Day & Gray 2015: 215).

In order to deal with the problem delineated above, the following measures were introduced in South Africa in line with WHO, UNAIDS and other partners' recommendations to improve HIV and TB programme:

- (i) The development and implementation of a national service delivery agreement (NSDA) and Human Immune Virus /Acquired Immune Deficiency Syndrome, Sexually Transmitted Infections and Tuberculosis national strategic plan (NSP) to reduce death related HIV and TB by 50% and ensure that 80% of PLWH are initiated on ART to achieve a long and healthy life for all South Africans (NDoH 2010:4; NDoH 2011:12).
- (ii) Establishment of National Core Standards (NCS) from the office of standard compliance and ideal clinic realization to ensure quality care and integration of the health care services, supported by training of health care worker on Primary care 101 as a guiding tool for implementation (NDoH 2011:11).
- (iii) Decentralization and strengthening the district health system (DHS) through the PHC re-engineering approach and district clinical specialist

team (DCST) (Hendricks, Seekoe, Roberts, Buch & Bossert 2015:60; NDoH 2011:2).

- (iv) Adopting WHO recommendations of task shifting to tackle health worker shortages, especially in the African region (WHO 2007:3). SA has a critical shortage of skilled health professionals against the population of 55.4 million (Rispel & Bruce 2015:117).
- (v) Mandatory accreditation of all PHC fixed facilities to initiate ART increase access ARV and establishment of regional training centres (RTC) to upscale the capacity of the health care workers with regard to HAST programmes (NDoH 2003:5; Kurth 2016:345).
- (vi) Training of nurses on NIMART and Integrated Management of Childhood Illness (IMCI) to increase access to ART to both adults and children (Simelela & Venter 2014: 4).
- (vii) Introduction of the Clinical mentorship programme to improve the knowledge, skills, competency and confidence of newly trained nurses in ART initiation (DoH 2011: 5).
- (viii) Adoption and implementation of WHO ambitious treatment target of 90-90-90 strategy to help end the AIDS epidemic by ensuring that 90% of all PLWH are tested to know their HIV status, 90% of people diagnosed with HIV infection should receive sustained ART and that 90% of all people receiving ART should be virally suppressed (UNAIDS 2014:1), including the introduction of Pre-Exposure Prophylaxis (PrEP) and universal test

and treat (UTT) to contribute to HIV reduction by 2030 (NDoH 2015: 1; Gonzalez, 2016).

(ix)The electronic Health Information System Program (HISP) has been developed and implemented to improve reporting, monitoring, evaluation and quality in data management which includes web-based District Health Information System (DHIS), Tier.net and ETR.Net (Wolmarans et al. 2015:39).

The South African government, together with its supporting partners, has developed and implemented various measures and strategies to reduce the burden of diseases with some degree of success in other programmes such as PMTCT but there are still stark challenges in ART and TB due to various factors that need to be investigated. Studies reveal an uneven pattern and severe shortfalls in many areas of MDG and life expectancy that still linger below the set target (Day & Gray 2015:198). In 2013, approximately 3000 PHC facilities in SA were accredited to initiate ART, even though PLWH on ARV are still below target (Bekker et al. 2014:110). Decentralization and implementation of PHC re-engineering services resulted in improved delivery, even though DCST is still experiencing role confusion and this might have a negative impact on the efficacy of HIV management (Obivien 2015:49).

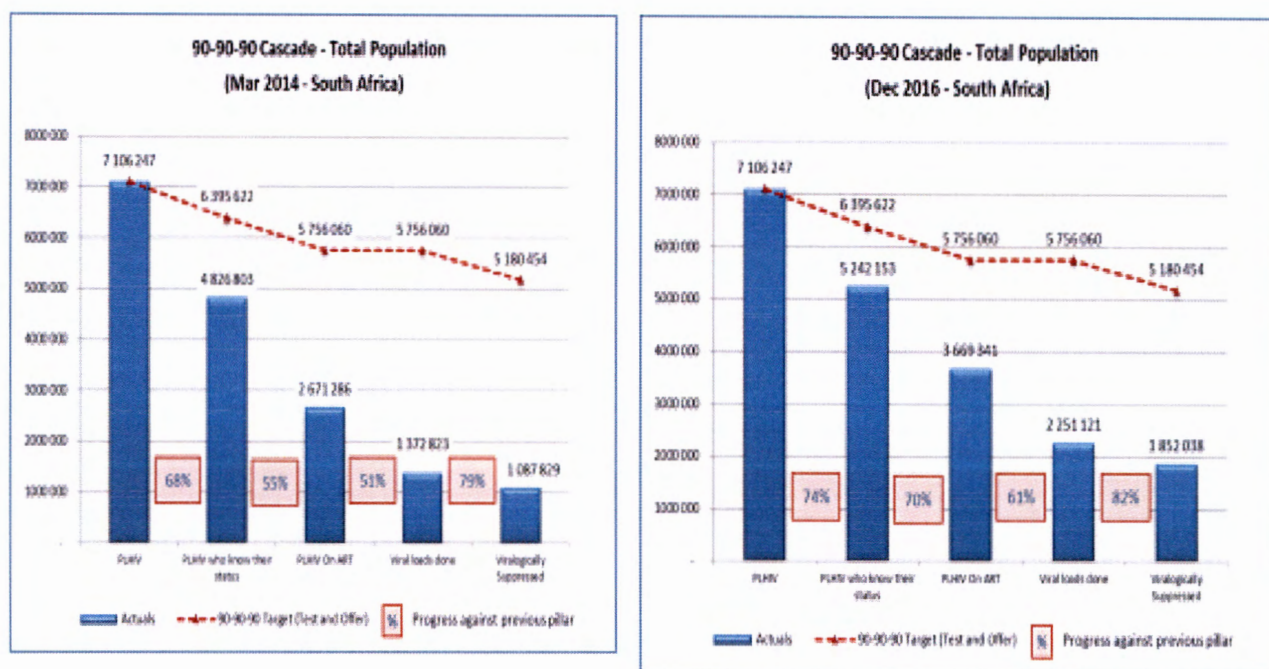
The infrastructure of the public health care system, especially in rural areas is still qualitatively poor and such parlous infrastructure makes it difficult to render HIV and TB services (Simelela & Venter 2014: 250). Compliance to world health standards

is a serious challenge. Fryatt and Hunter (2015:24) reported that an audit of ideal clinics and NCS shows that public facilities in South Africa collectively scored less than 50% compliance with vital measures, scoring a mere 34% in patient safety and security and an even lower 30% in the area of positive and caring attitudes. PHC facilities scored less than hospitals. Although the prevalence of HIV has slightly declined by 19.1, the number of PLWH and TB not initiated on ART is increasing, despite the changes in 2015 national guidelines to provide early ART and initiate at CD4 count ≤ 500 cells/ μ . The recommendations also seek immediate initiation of lifelong ART for all HIV positive pregnant and breastfeeding women and all children under 5 years regardless of CD 4 cell count (NDoH 2015:14). Despite the implementation of task shifting strategies amongst health care, South Africa still experiences a serious shortage of staff. Ironically, South Africa has the largest ART programme globally with approximately 2.8 million on ART, compliments to the support of partners and some domestic resources (Day & Gray 2015:293). Nurses initiate ART mostly to adults and there is a very low percentage on children, even though the practicing nurses have been trained on NIMART and IMCI (Cameron et al 2012:98; Lori et al 2016:315). Nurses still refer patients with TB and HIV co-infections, stage three and four clients to doctors to initiate ART (Gree et al., 2014:4). Studies conducted by Nyasulu et al., (2013:234), Smith et al., (2016: 324), Munsamy and Botha (2014:92) and Swart et al., (2013:182) reveal that there is inadequate clinical mentorship and nurses lack confidence to initiate ART. Such a situation paints a grim picture with regard to compliance and implementation of guidelines

that currently are very poor. According to Day and Gray (2015:225) and Nel (2014:12), in the NW Province, ART initiation is decreasing while TB cases are increasing. These researchers also observed that adherence counselling is inadequate and the total number of clients remaining on ART is decreasing. More worrisome is the observation that there is a high rate of loss to follow up in TB. Management of adverse and side effects, switching and changing of combined ARV regimen together remain huge challenges and lead to virological failure, resistance, loss to follow up and death (Dintwe & Rheeder 2015:5; Worthington, Brien, Mill, Caine, Solomon & Chaw-kant 2016:10). There is still poor information management which negatively affects decision-making, especially in rural areas (Wolmarans et al., (2015:39; Scott, Dingito & Xapile 2015:141).

The 90-90-90 targets set in South Africa are still below targets in 2016 and it is a similar situation in NWPDoh, despite the introduction of the policy strategy in 2014, as presented in Fig 1 (NDOH, 2016). The percentage of people diagnosed with HIV infection is less than the people initiated on ART. On the other hand, the number of people who collected blood for viral load monitoring to determine the effectiveness of treatment is lower than those initiated on ART and affects the performance of the viral suppression rate. All cascades were below 90% in 2014 and in 2016.

Fig: South Africa HIV Cascades -March 2014 vs. Dec 2016



***Derived primarily via DHIS and NHLS. Represents coverage via the public sector.**

Apart from the measures and strategies introduced in South Africa to improve access to ART and management of HIV programme, serious gaps still exist that might lead to poor performance of the programme in Ngaka Modiri Molema District in the NW province. These gaps relate to the observations that PNs are either not implementing what they have been trained to do or they are not complying with changes of NDoH policies and guidelines. Another implication is the fact that PNs do not record or report accurately. Another cause could be attributed to them not having been mentored efficiently or effectively to be competent to initiate and manage ART. Equally, there is some evidence pointing to poor data management or

PNs setting targets that are very high in relation to PLWH eligible for ART. These need to be investigated in order to develop a model that would strengthen NIMART training and implementation (NDoH, 2014)

2. PROBLEM STATEMENT

Approximately 94% of professional nurses (PN) in Ngaka Modiri Molema district of the NW province have been trained on NIMART since 2011. Clinical mentorship is therefore provided in the facility level and all PHC fixed facilities initiating ART (Skill Audit, 2014). A post training assessment was conducted by the regional training centre (RTC) to evaluate the effectiveness of NIMART using the DHIS statistics on ART indicators from facilities of NIMART trained nurses after 12 months (2012-2013). The results showed no marginal increase or effect on the facility performance as compared to pre-training. An observation was also made during district performance monitoring reviews for 2015/2016 and it was identified that the HAST priority programmes performance is very low, yet these are supposed to be the key drivers to achieve a long and healthy life for all South Africans, as articulated in the goals and objectives of 2012/2016 NSP. New patients initiated on ART who include adults and children at 59%, instead of a target of 91.6%, TB/HIV co-infected clients initiated on ART at 820 while there are 1804 TB clients who are HIV positive. Antenatal care (ANC) clients initiated on ART rate at 72.2% instead of the target of 95%. Various strategies have been introduced to improve NIMART training and

implementation, however, gaps still exist. The performance of the HIV and TB programme is still poor. The NMM district has a high number of adults and children tested HIV +ve, which is contrary to the number of patients initiated on ART in the same space. Patients are not receiving sustained ART and this is evident in the total number of patients remaining on ART (TROA) decreasing monthly, loss to follow up (LTFU) for viral load collection increasing and this contributes to the high number of patients not virally suppressed. Such LTFU imposes a serious challenge to HIV prevention. This might be because nurses are not implementing what they have trained for or mentorship provided does not sufficiently address competency and confidence to initiate ART or perhaps other organizational factors complicate and hinder implementation. As a result of the observations and challenges stated above, the researcher became interested in conducting a detailed study to answer the following questions:

- What is the impact of NIMART training on HIV management?
- What are the challenges influencing the implementation of the HIV programme in NMM district PHC facilities?

The responses to these pertinent questions were used to develop a conceptual framework that seeks to provide guidance to strengthen NIMART training and implementation thereby improving the performance of the HIV programme.

3. PURPOSE AND OBJECTIVES OF THE STUDY

3.1. Purpose of the study

The aim of the study was to develop a Conceptual Framework for Strengthening Nurse-Initiated Management of ART Training and Implementation in North West Province.

3.1.1 Objectives of the study

The following objectives were identified to achieve the purpose and to answer the research questions of the study that sought to:

- Determine the impact of NIMART training on the HIV programme
- Explore the challenges or constraints including achievement in the implementation of the NIMART
- Make inferences between quantitative and qualitative results to understand the impact NIMART training and performance of the HIV programme
- Develop a conceptual framework for improving and strengthening NIMART training and implementation in the North West province

4. SIGNIFICANCE OF THE STUDY

The potential findings of the study are likely to inform policy makers, HIV programme managers and developers of NIMART about the training curriculum and teaching and learning strategies about factors affecting the performance of the

programme. Furthermore, the findings could be used in future to improve the management of the HIV and TB programme and practice in order to promote, prevent and reduce the burden of disease, including increasing life expectancy. The study is also likely to provide evidence about the effectiveness of NIMART training on HIV management in the NMM district.

5. DEFINITION OF CONCEPTS

Evaluation: refers to assessment or making judgment about the amount, number or value of something (Concise Oxford Dictionary 2011: 396). It is a systematic, rigorous analysis, or determination of the subject, activity or programme's merit, worth, significance and determination of support management accountability, effectiveness and efficiency. In this study, evaluation refers to assessment of the effectiveness of the NIMART training process in relation to the efficient management of the HIV programme.

Impact: a marked or strong effect or influence on something (Concise Oxford Dictionary, 2011: 596). A measure of tangible and intangible effects on a thing or upon another. According to Babbie and Mouton (2012:340), impact is the degree to which the programme produces the desired outcomes and its benefits in relation to its costs or efficiency. In this study, impact refers to the effect that the NIMART training has on the achievement of HIV programme targets as measured by the South African National Indicators Data Sets (NIDS).

NIMART Training: According to NDoH (2009:40), this is a nurse-initiated and managed anti-retroviral therapy training in order to increase access to ART. It is an organized process or activity of teaching nurses on ART initiation and management at NWPDoH by imparting knowledge about HAST programme, the provision of clinical mentorship to improve practical skills, confidence and competency in the delivery of a comprehensive quality care, treatment and support in the PHC level.

Primary Health Care: According to WHO (1978:5), PHC refers to “essential health care” that is based on scientifically sound and socially acceptable methods and technology, which makes universal health care universally accessible to individuals and families in a community. Ramkilowan (2013:51) describes PHC as the first level of contact with the community within the health care system provided primarily by multi-skilled community health workers who must receive training in the health promotion, disease prevention as well as in basic curative medicine.

Facility: According to NDoH (2001), a facility is a clinic or a centre or hospital where and from where health care services are provided and it is normally open for 8 or more hours a day, based on the need of the community served. It is also a fixed building or structure designed for and accredited to offer or deliver promotive, preventive, curative and rehabilitative health care services on community level and that adheres to the principles of the PHC philosophy (operational definition).

6. CENTRAL THEORETICAL STATEMENT: CONCEPTUAL MODEL

There are two models that are critical to the formulation of the theoretical lens through which this study is conceptualized: The Donabedian's Structure-Process-Outcomes (SPO) model and Dickoff, James & Wiedenbach's, practice-oriented theory. These are detailed in the subsequent section.

6.1. Donabedian's SPO

The study was based on Donabedian's (SPO) model that provides a framework that the researcher uses to evaluate and improve the implementation of HIV management after NIMART training (Donabedian, 1966). The structure of the fixed PHC facilities providing ART or health care system and the process of NIMART training to professional nurses has a great influence on the achievement of the health outcomes.

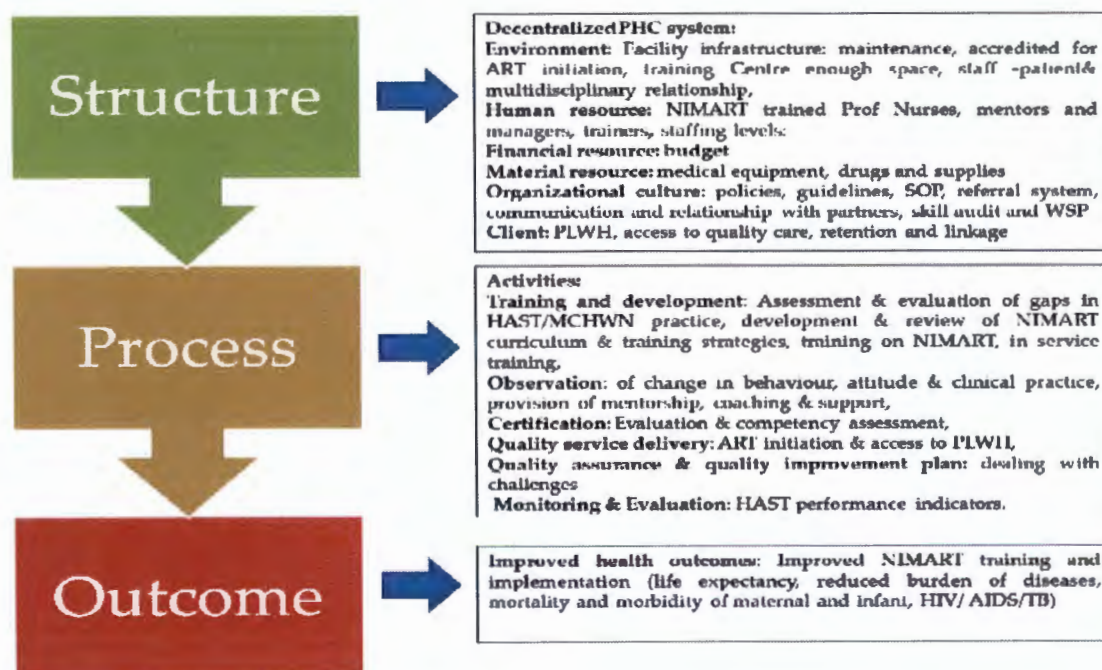


Fig 1: Donabedian's structure –process-outcomes Model (SOP)

6.2. Dickoff et al. Practice – Oriented Theory

The conceptual framework was developed following Dickoff, James & Wiedenbach, (1968), practice-oriented theory, as presented in Fig 2. The six elements used in the theory were presented in the form of questions and was found to be more relevant in the development of the conceptual framework and integrated to Donabedian's SPO model. The provincial and district RTC, HEI and other stakeholders as the agents of the NIMART training process has the responsibility to facilitate effective quality training to PNs and student nurses within the context of the DHS, guided by the goals and objectives of the NIMART training and HIV programme to increase efficiency in the management of PLWH thus results in improved patient and HIV programme outcomes. Again, this can facilitate development of confidence and competence of NIMART trained nurses. Furthermore, motivation, acknowledgement and recognition are dynamics that can be used to add energy and improve performance of NIMART nurses and facilitators.

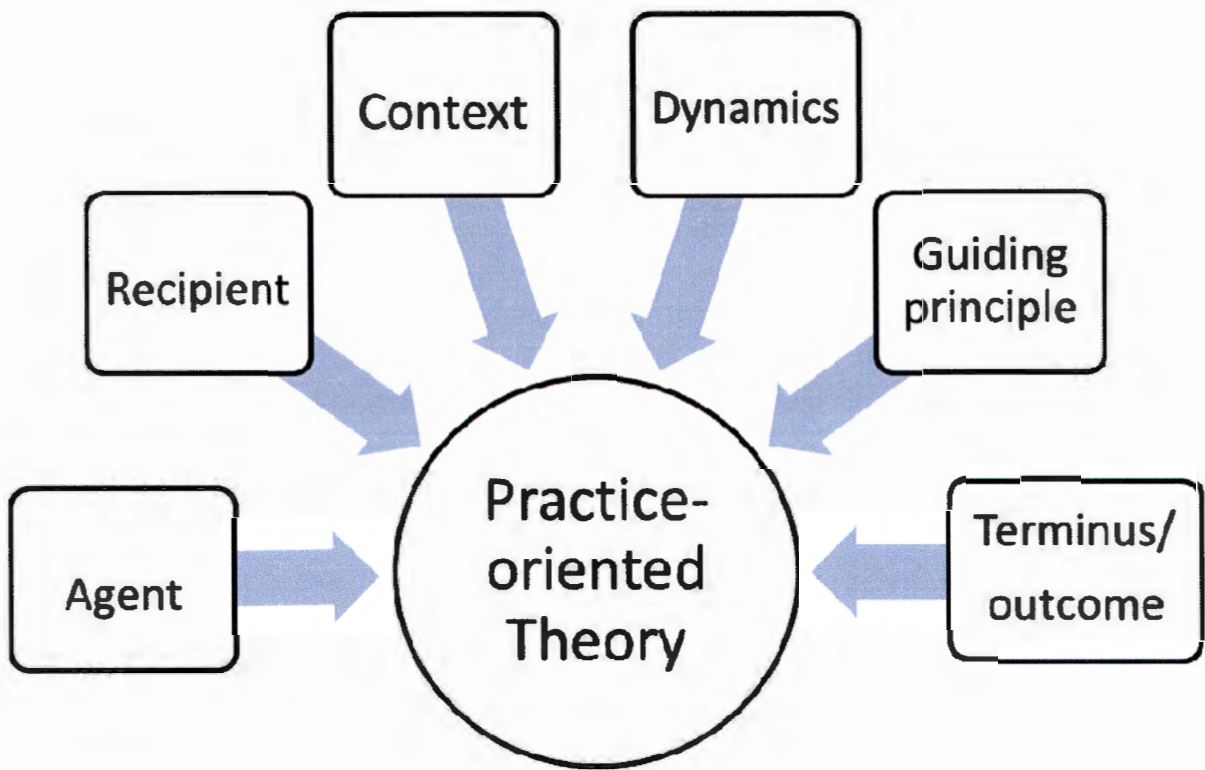


Fig 1: Dickoff et al, Practice –oriented theory (POT)

7. THE STUDY PARADIGMATIC PERSPECTIVE

The pragmatic worldview or perspective was used as a philosophical basis of the study. Worldview refers to “a basic set of beliefs that guide action” (Creswell 2008:6). It is useful in social science research and allows the use of multiple approaches and methods to understand and derive knowledge about the problem.

7.1. Ontological assumptions

The researcher is convinced that there are different views and truth about the phenomenon under study and mixed methods was used. The truth was from the statistics and views offered by and obtained from the participants. There are connected to the multiple realities about the impact of NIMART training on the performance of HIV management programmes and need for a critical evaluation using both qualitative and quantitative methods to reach quality conclusion.

7.2. Epistemological assumptions

The professional nurses, programme managers and the researcher are experts in NIMART training and HIV management, therefore knowledge is socially constructed from their views.

7.3. Methodological assumptions

The researcher understands the interplay of views and evidence that mixed methods provide, stemming from the use of mix designs, data collection and analysis methods. Mixed methods are anticipated to yield better results in determining and evaluating the impact of NIMART training on HIV management, including the facets of exploring constraints regarding the implementation of the programme (Creswell 2008:17).

8. METHODOLOGY: RESEARCH DESIGN AND METHODS

8.1. Research strategy: Mixed method

An explanatory sequential mixed method research strategy was used in this study (Creswell 2009:209). Mixed methods refer to a research strategy in which a researcher combines qualitative and quantitative methods for comprehensive understanding of the phenomenon under study to produce more complete and validated conclusions (Munhall 2012:555) and (Babbie & Mouton 2011: 535). The methods were implemented in four phases namely; Phase 1: Quantitative, Phases 2: Qualitative, Phase 3: Interpretation and Meta-inference and Phase 4: Development of conceptual Model.

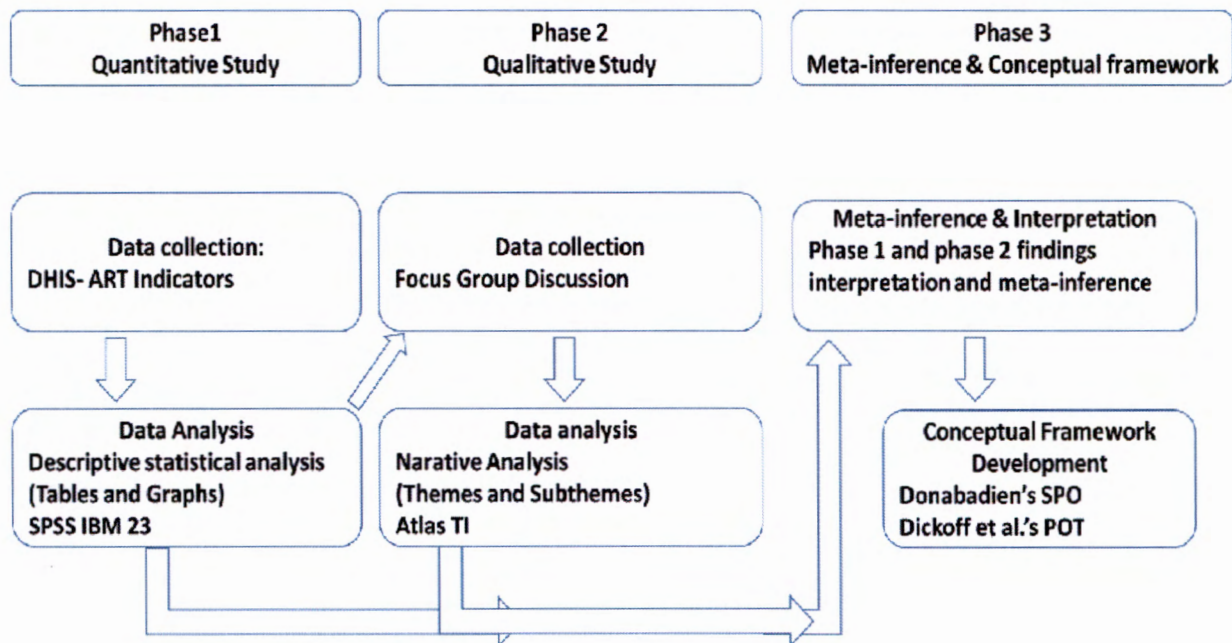


Fig 2: Explanatory sequential mixed method and Conceptual Framework Development flow diagram

8.2. PHASE I: QUANTITATIVE METHODS

8.2.1. Quantitative design: Descriptive programme evaluation

A descriptive programme evaluation research design was used in the study to examine the impact of NIMART training on HIV management. Programme evaluation research refers “to an applied system scientific methods used to measure or assess the implementation, conceptualization, design, utility and outcomes or impact of social programmes for decision making purpose”, and very useful in mixed methods (Babbie & Mouton 2011: 335).

8.2.2 Study setting

The study was conducted in NMM district in the NW Province. The NWProDoH has decentralized the HIV and TB programme management including the Regional Training centre (RTC) to the DHS level. NIMART training and HIV management is conducted in the level and is only implemented by PNs working in the PHC clinics and CHCs after training, supported by the DCST and developmental partners. The district, tertiary and regional hospitals are used for referral of complicated cases that need medical officers or specialize care. The NNM district area is predominately rural, with 842 699 people, 24% of the province population (APP 2016:19) with five (5) Sub districts or local municipalities. The district comprises 94 PHC fixed facilities (clinics and CHCs) initiating ART (NDoH 2015: 79). There are 476 PNs and 447 (94%) trained in NIMART (Skill audit 2015).

8.2.3 Population

The population of the study includes all NMM district fixed PHC facilities (N=94).

- **Inclusion criteria:** facility with PNs trained in NIMART.

8.2.4 Sample selection and size

A stratified simple random sampling method was used to select CHCs and clinics that meet the inclusion criteria. In NMM district all PHC fixed facilities are offering HIV and ART initiation services, hence they were selected to be part of the study. The list of CHCs and clinics was compiled and grouped per sub district. The facilities were further sub grouped per location into rural, semi urban and urban. Thereafter selected by skipping two facilities and pick up the third one from each sub district. This process was followed to ensure greater degree of representativeness, allow generalization and to reduce error (Groves et al., 2013:44; Babbie & Mouton 2011: 191). A total number of n=10 facilities were selected to take part in the study.

8.2.5 Quantitative data collection instrument

Groves et al., (2013:45) defines data collection as the precise, systematic gathering of information relevant to the study. Data were collected from secondary source. Statistics was extracted from the national indicators data sets (NIDS) used to establish a reliable database of the HIV programme. The HIV data captured in the DHIS from January 2012 to December 2016 was used. The following variables were measured:

- Adult started on ART during this month – naïve;
- Child under 15 years started on ART during this month – naïve;

- ANC pregnant women initiated on ART.
- Number of PN trained on NIMART from RTC skill audit report 2015/2016.

8.2.6 Quantitative data analysis

Descriptive statistics was used to determine the number of PNs trained on NIMART and those initiating ART, cross-tabs was used to describe the target of the indicators on ART initiation and actual performance of facilities, furthermore, the correlation co-efficient (r) to establish the relationship between NIMART training and performance of the HIV programme.

8.2.7 Rigor in quantitative research: reliability of data collection instrument and Validity

Reliability refers to the consistency with which an instrument measures what it was supposed to measure (Babbie & Mouton 2011:217). Data was collected from the already existing reliable source, DHIS to avoid regression. Study validity refers to a measure of the truth or accuracy of the claim (Grove et al., 2013:197). All NMM PHC fixed facilities was randomly selected to ensure representativeness and allow generalization. Face validity refers to the degree to which the assessment or test measures the variable that are supposed to measure (Grove et al., 2013:197), specific NIDS were selected from the DHIS to measure the impact of NIMART training process on the HIV management in NMM district , NWPDOH, as indicated in 8.2.5 . Content validity refers (Grove et al., 2013:197), the statistics were verified, validated and cleaned up before use by data management experts. There was no subjects' attrition as the study involves only statistics

8.3. PHASE 2: QUALITATIVE METHODS

8.3.1 Qualitative design: Programme evaluation

An explorative programme evaluation research design was used to explore and describe the constraints, weaknesses and strength of NIMART training and implementation among PNs and programme managers based on the findings of the quantitative study in Phase 1.

8.3.2 Population

The population of the study included all NMM district PNs and programme managers.

Inclusion criteria: NIMART trained PNs from PHC facilities and Managers directly involved in the implementation and management of the HIV programme.

Exclusion criteria: Non- NIMART trained PNs and Managers not directly involved in HIV management.

8.3.3 Sample selection and size

A purposive non-probability sampling method was used in the study. Participants was recruited from the facilities selected in Phase 1 and meeting the inclusion criteria, in order to collect the richest possible data (Babbie & Mouton 2011:168). Qualitative research sample size depends on data saturation; five FGDs was conducted (Grove et al., 2013:278).

8.3.4 Data collection method: Focus group Discussions

A Focus Group Discussion (FGDs) was conducted with PNs and programme managers in a private room and was tape recorded. Permission was obtained from participants and each FGD will consist of 6- 12 participants (De Vos et al., 2012: 351).

8.3.5 Data collection instrument

Unstructured interview was used to collect data and follow up questions done based on the results of Phase 1 quantitative results to make sound conclusions. The main question was:

- What are the challenges influencing NIMART training and implementation in NMM district PHC facilities? , followed by probing questions.

Demographic data of the participants was also collected to obtain a better understanding of the NIMART nurses position, experience , educational level, processes exposed to after training which includes mentorship and assessment for competency to make sound conclusions.

8.3.6 Qualitative data analysis

Qualitative data analysis occurs simultaneously with data collection. The process of ATLAS.ti was used to analyse data. The basic data analysis steps of notice-collect-think (NCT) were followed in the study (Freise, 2012). These basic steps enabled the researcher to work in a systematic manner instead of relying only on the software (Frieise, 2012:228). These coding was divided into descriptive-level and conceptual-level analysis.

8.3.6.1 Descriptive-Level Analysis

This level of analysis comprised two stages, thus first stage coding and second stage coding.

First-Stage Coding

The tape recorded FGDs were transcribed verbatim and captured in Microsoft excel before exported to ATLAS TI. Transcripts and field notes were read and re-read until patterns of the data was noticed; then write notes, mark segments and attach first preliminary codes.

Second-Stage Coding

In this stage the searcher became more immersed in data and started validating if codes were correctly and carefully selected. Some participants requested to review data collected and how it is being interpreted by the researcher. New but few codes were added. Similar codes were merged together. Categories and sub categories were classified and further developed into themes for analysis. Transcribe and coded data was made available to an experienced researcher for peer review and ensure dependability. Therefore, the data was ready for the next level analysis.

8.3.6.2 Conceptual-Level Analysis

In this stage, the ATLAS TI was used to link data using network views function, exploring developed ideas further and integrating all categories and themes in writing supported by literature to make it meaningful. Data was presented in tables.

8.4 Phase 3: Meta-Inference and Conceptual Framework

Interpretation of quantitative and qualitative results was done, compared and discuss to make a sound conclusion. The conceptual model was developed from the qualitative and quantitative findings and the conceptual framework was developed using Donabadien's SPO model and Dickoff et al.'s POT.

9. TRUSTWORTHINESS IN QUALITATIVE RESEARCH

Trustworthiness involves ensuring; credibility, transferability, dependability and conformability of the study findings (Grove et al., 2013:197). Credibility in the study was enhance by the use of mixed methods, spending enough time with participants until data saturation, validating data with participants and peer debriefing. Conformability was enhanced by allowing an experience researcher to scrutinize data and conducting a pilot study to help in the development and refinement of study methods. Dependability was enhanced by keeping all tape-recorded data and notes safe for future reference including credibility. Transferability was enhanced by the use of purposive sampling to obtain data from NIMART trained nurses who are implementing the HIV programme in the PHC facilities. (Babbie & Mouton 2011:217; Grove et al., 2013:197).

10. ETHICAL CONSIDERATIONS OF THE STUDY

Ethics guidelines serve as standards and basis upon which each researcher evaluates his/her own conduct. This includes protecting the rights of participants and institutions by obtaining permission from research committee and Informed Written Consent. They were provided with detailed information about the nature, purpose, benefits and risk of the study, the use of tape recorder and that there were no material or financial benefits for participating. Maintaining privacy, anonymity and confidentiality in all procedures. Participation by NIMART nurses was voluntary and they were informed of the rights to terminate or withdraw at any stage of the study without penalty, fear or prejudicial treatment. Participants were treated equally with respect and dignity (Grove et al., 2013: 125) and (LoBiondo-Wood & Haber 2010: 251). The study received approval from the NWU institutional research regulatory committee and permission to conduct the study obtained from the NWPDoH research committee. The ethical clearance number of the study is NWU-00607-17-A9

11. THESIS OUTLINE

This thesis is presented in the following sequence:

SECTION ONE: Overview of the study

SECTION TWO: Manuscripts

Manuscript one: Implementation of NIMART training and: literature review (submitted for publication to *Curationis Journal*)

Manuscript two: Impact of NIMART training on HIV management (To be submitted to *International journal of African Nursing Sciences*)

Manuscript three: Challenges regarding NIMART training implementation on HIV management (To be submitted to *Health SA Gesondheid Journal*)

Manuscript four: Conceptual framework to strengthen NIMART training and Implementation management (To be submitted to *International journal of African Nursing Sciences*)

SECTION THREE: Conclusions, Limitations and Recommendations

REFERENCES

- Asmall, S. and Mahomed, O. 2014. Integrated chronic disease management manual. Pretoria: National Department of Health.
- Babbie, E. and Mouton, J. 2011. The Practice of social research. Edited by Vorster, P. and Prozesky, B. Cape Town: Oxford University Press.
- Bekker, L.G., Venter, F., Chen, K., Goemore, E., Van Custsem, G., Boutle, A. and Wood, R. 2014. Review provision of antiretroviral therapy in South Africa: The nuts and bolts. *International medical press*, 19 (3): 105-116.
- Cameron, D., Curber, A., Mbata, M., Mutyabule, J and Short, H. 2012. Nurse initiated and maintenance of patients on anti- retroviral therapy. Are nurses in primary health care clinics initiating ART after attending NIMART training? *The South African Medical Journal*, 102(2): 98-100.
- Concise Oxford English Dictionary. 2011. Oxford University Press: Oxford.
- Creswell, J.W. 2009. *Research design. A quantitative, qualitative and mixed method approaches*. 3rd ed. SAGE: Los Angeles.
- De Haan, M. 2013. Health of Southern Africa. In V. Vasutharan, Ramkilowan S and Mthembu, S (Eds.), 10th ed. The mixed methods reader. Juta: Cape Town, 40-52.
- Dennill and Mkosi-Rendall K. 2014. *Primary health care in Southern Africa: A comprehensive approach*. 4th ed. Oxford university press: Cape Town.
- Dintwe, M.N.P and Rheeder, P. 2015. Management of dyslipidaemia in HIV infected patients on combined ART: effects of intervention. Pretoria: University of Pretoria (Dissertation - Master's degree).

- De Vos, A.S., Strydom, H., Fouche. C.B., and Delpont, C.S.L. 2012. *Research at Grass roots for the social sciences and human service professions*. 4th ed. Van Schaik publisher: Pretoria.
- Gonzalez, L.L. 2016. South Africa rolls out HIV treatment ARVs to sex workers. *Sowetan*. 14 March. <http://www.sowetanlive.co.za/news/>. Date of access: 24 April 2016.
- Green, A., de Azevedo, V., Pathern, G., Devies, M.A., Ibeto, M., and Cox, V. 2014. Clinical mentorship of Nurse initiated ART in Khayelitsha, South Africa. A quality of care assessment. *Public library of science*, 9(6): 1-10.
- George, D.I., Colvin, C.J., Lewin, S., Fairall, L., Bachmana, M.O., Vlebel, K.M., Draper, B and Batema, E.D. 2012. Implementing nurse initiated and managed antiretroviral (NIMART) in South Africa: A qualitative process evaluation of the STRETCH trial. *University of Cape Town* 7 (66). Date accessed: 5 April. 2016.
- Grove, S.K., Burns, N and Gray, J.R. 2013. *The Practice of Nursing Research: Appraisal, Synthesis, and Generation of Evidence*. 7th ed. Elsevier Saunders.
- Hattingh, Dreyer and Roos. 2012. Community nursing. A South Africa manual. In V. Peu, D., Hlahane, S., Madumo, M., Mataboge, S., Petlhu, R., Prinslo, L and Ricks E (Eds.), 4th Ed. Oxford University Press. Juta: Cape Town.
- Health system trusts. South Africa health reviews. 2014- 2015. Pretoria: Health system trusts. <http://www.hst.org.za>.
- Joint United Nations on HIV/AIDS. Global report, 2013. Republic of Uganda. Kampala. Uganda: UNAIDS, 2014.
- Joint United Nations on HIV/AIDS 90-90-90. An ambitious treatment target to help end the AIDS epidemic. Geneva: UNAIDS, 2014.
- Joint United Nations on HIV/AIDS. The gap report. Geneva: UNAIDS, 2014

- LoBiondo-Wood, G. and Haber, J. 2010. *Nursing Research: Methods and critical appraisal for evidence based practice*. 7th ed. Mosby Elsevier: New York.
- Morgan, D. L. (2008). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. In V. Plano-Clark and J. Creswell (Eds.), *The Mixed Methods Reader* (29-65). Thousand Oaks, CA: Sage Publications
- Munhall, P.L. 2012. *Nursing research. A qualitative perspective*. 5th ed. Jones and Barlett learning: Canada.
- Munsamy, M and Botha, I. 2014. A clinical audit of the implementation of the TB tool screening amongst clients who are on ART in the eThekweni local municipality clinics. Durban: Durban University of Technology. (Dissertation - MA in Technology).
- North West province Department of Health. 2015-2016. Annual performance plan. Mahikeng. South Africa
- North West province Department of Health. District health information system database. Mahikeng. Time series (2012-2015). South Africa
- North West province Department of Health five year strategic plans. 2015- 2016-2019/2020. Mahikeng. South Africa
- National Department of Health. 2003. Operational plan for HIV and AIDS, care, management and treatment for South Africa. Pretoria. South Africa
- National Department of Health. 2014. National consolidated guidelines for the prevention of mother –to- child transmission of HIV and the management of HIV in children, adolescents and adults. 2015: Pretoria. South Africa

- National Department of Health. Delivery agreement. 2010. Pretoria South Africa
- National Department of Health. 2011. PHC outreach teams implementation toolkit. 2011. Pretoria. South Africa
- National Department of Health. 2011. Clinical mentorship manual for integrated services. Pretoria. South Africa
- National Department of Health. 2011. National core standards for health establishments in South Africa: Towards quality care for patients. Pretoria. South Africa
- National Department of Health. 2015. South Africa pre-Exposure Prophylaxis (PrEP) clinical guidelines. 2015: Pretoria. South Africa
- Nel, Y.M., and Johnson, G. 2014. Factors associated with attendance at first clinic appointment in HIV Positive psychiatric patients initiated on anti-retroviral therapy as in patients. Johannesburg: Witwatersrand University. (Thesis – MA medicine).
- Sifanelo, G.M and Theron, F. 2010. An assessment of effectiveness of primary health care service in addressing HIV/AIDS by providing ART treatment: The case of Du noon clinic in the western health sub district of the city of Cape Town. Stellenbosch: Stellenbosch University. (Dissertation, MA in Public Administration).
- Simelela, N.P and Venter W.D.F. 2014. A brief history of South Africa in response to AIDS. *South African Medical Journal*, 104 (3): (249-251)
- Polit, D.F and Beck, C.T. 2011. *Essentials of Nursing Research: Appraisal Evidence for Nursing Practice*. 7th ed. Wolters Kluwer. Lippincott. Williams and Wilkins.

World Health Organization. HIV/AIDS programme strengthening health services to fight HIV/AIDS. Geneva: WHO, 2007.[http://www.who.int/hiv/toronto2056/talking stock tr](http://www.who.int/hiv/toronto2056/talking_stock_tr). Date access:

World Health Organization. World health statistics. Geneva: WHO, 2015.

World Health Organization and United Nations Children update on Millennium developmental goals assessment: 25 years of progress on sanitation and drinking water assessment. Geneva: WHO, 2015.

World Health Organization. Integrated collaborative TB and HIV services within a comprehensive package of care for people who inject drugs. Consolidated guidelines. Geneva: WHO, 2016. [Who/htm/tb/2016-02](http://www.who.int/htm/tb/2016-02)

Appendix A

Journal Author Guidelines for Manuscript One: Curationis

Structure and style of your empirical research article

The page provides an overview of the structure and style of your empirical research article to be submitted to the *Curationis*. The empirical research article provides an overview of innovative research in a particular field within or related to the focus and scope of the journal presented according to a clear and well-structured format (between 3500 and 7000 words with a maximum of 60 references). Compulsory as a supplementary file: Ethical clearance letter/certificate.

- **Language:** Manuscripts must be written in British English.
- **Line numbers:** Insert continuous line numbers.
- **Font:**
 - **Font type:** Palatino
 - **Symbols font type:** Times New Roman
 - **General font size:** 12pt
- **Line spacing:** 1.5
- **Headings:** Ensure that formatting for headings is consistent in the manuscript.
 - First headings: normal case, bold and 14pt
 - Second headings: normal case, underlined and 14pt
 - Third headings: normal case, bold and 12pt
 - Fourth headings: normal case, bold, running-in text and separated by a colon.

Our publication system supports a limited range of formats for text and graphics.

Text files can be submitted in the following formats only:

- Microsoft Word (.doc): We cannot accept Word 2007 DOCX files. If you have created your manuscript using Word 2007, you must save the document as a Word 2003 file before submission.
- Rich Text Format (RTF) documents uploaded during Step 2 of the submission process. Users of other word processing packages should save or convert their files to RTF before uploading. Many free tools are available that will make this process easier.



For full details on how to ensure your manuscript adheres to the house style, [click here](#).

The structure and style of your original article

Page 1

The format of the **compulsory cover letter** forms part of your submission and is on the first page of your manuscript and should always be presented in English. You should provide all of the following elements:

- **Article title:** Provide a short title of 50 characters or less.
- **Significance of work:** Briefly state the significance of the work being reported on.

- **Full author details:** Provide title(s), full name(s), position(s), affiliation(s) and contact details (postal address, email, telephone and cellular number) of each author.
- **Corresponding author:** Identify to whom all correspondence should be addressed to.
- **Authors' contributions:** Briefly summarise the nature of the contribution made by each of the authors listed.
- **Summary:** Lastly, a list containing the number of words, pages, tables, figures and/or other supplementary material should accompany the submission.

Page 2 and onwards

Title: The article's full title should contain a maximum of 95 characters (including spaces).

Abstract (first-level heading)

- Do not cite references in the abstract.
- Do not use abbreviations excessively in the abstract.
- The abstract should be written in English.
- The abstract should be no longer than 250 words and must be written in the past tense. The abstract should give a succinct account of the objectives, methods, results and significance of the matter. The structured abstract for an Original

Research article should consist of five paragraphs labelled Background, Objectives, Method, Results and Conclusion.

- **Background:** *Why do we care about the problem?* The context and purpose of the study (what practical, scientific or theoretical gap is your research filling?).

- **Objectives:** *What problem are you trying to solve?* What is the scope of your work (a generalised approach, or for specific situation). Be careful not to use too much jargon.

- **Method:** *How did you go about solving or making progress on the problem?* How the study was performed and statistical tests used (what did you actually do to get the results). Clearly express the basic design of the study, name or briefly describe the basic methodology used without going into excessive detail. Be sure to indicate the key techniques used.

- **Results:** *What is the answer?* The main findings (as a result of completing the above procedure/study what did you learn/invent/create?). Identify trends, relative change or differences on answers to questions.

- **Conclusion:** *What are the implications of your answer?* Brief summary and potential implications (what are the larger implications of your findings, especially for the problem/gap identified in your motivation?).

Introduction (first-level heading)

The introduction contains two subsections, namely the background section and the literature review.

- **Problem statement (second-level heading):** The setting section should be written from the standpoint of readers that is, without specialist knowledge in that area and must clearly state and illustrate the introduction to the research and its aims in the context of previous work bearing directly on the subject. The setting section to the article normally contains the following five elements.
 - **Aims of the study/Key focus (third-level heading):** A thought-provoking introductory statement on the broad theme or topic of the research.
 - **Background (third-level heading):** Providing the background or the context to the study (explaining the role of other relevant key variables in this study);
 - **Trends (third-level heading):** Cite the most important published studies previously conducted on this topic or that has any relevance to this study (provide a high-level synopsis of the research literature on this topic).
 - **Research objectives (third-level heading):** Indicate the most important controversies, gaps and inconsistencies in the literature that will be addressed by this study. In view of the above trends, state the core research problem and specific research objectives that will be addressed in this study and provide the reader with an outline of what to expect in the rest of the article.

- **Definition of key concepts (third-level heading)**
- **Contribution to field (third-level heading):** Explanation of the study's academic (theoretical and methodological) or practical merit and/or importance (provide the value-add and/or rationale for the study).
- **Literature review (second-level heading):** The literature review is the second subsection under the Introduction and provides a brief and concise overview of the literature under a separate second-level heading, e.g. literature review. A synthesis and critical evaluation of the literature (not a compilation of citations and references) should at least include or address the following elements, ensure these are in the literature review. Define conceptual (theoretical) definitions of all key concepts; A critical review and summary of previous research findings (theories, models, frameworks, etc.) on the topic; A clear indication of the gap in the literature and for the necessity to address this void; and A clearly established link exists between formulated research objectives and theoretical support from the relevant literature.

Research method and design (first-level heading): This section should include:

- **Design (second-level heading):** Describe your experimental design clearly, including a power calculation if appropriate. Note: Additional details can be placed in the online supplementary location.
- **Materials (second-level heading):** Describe the type of organism(s) or material(s) involved in the study.

- **Data collection method/Procedure (second-level heading):** Describe the protocol for your study in sufficient detail (clear description of all interventions and comparisons) that other scientists could repeat your work to verify your findings.
- **Data analysis (second-level heading):** Describe how the data were summarised and analysed, additional details can be placed in the online supplementary information.
- **Context of the study (second-level heading):** Describe the site and setting where your field study was conducted.

Results (first-level heading): This section provides a synthesis of the obtained literature grouped or categorised according to some organising or analysis principle.

Tables may be used and/or models may be drafted to indicate key components of the results of the study.

- Organise the results based on the sequence of Tables and Figures you will include in the manuscript.
- The body of the Results section is a text presentation of the key findings which includes references to each of the Tables and Figures.
- Statistical test summaries (test name, p-value) are usually reported parenthetically in conjunction with the biological results they support, use SI unit.

- Present the results of your experiment(s)/research data in a sequence that will logically support (or provide evidence against) the hypothesis, or answer the question, stated in the Introduction.

All units should conform to the SI convention and be abbreviated accordingly. Metric units and their international symbols are used throughout, as is the decimal point (not the decimal comma).

Ethical considerations (first-level heading) Articles based on the involvement of animals or humans must have been conducted in accordance with relevant national and international guidelines. Approval must have been obtained for all protocols from the author's institutional or other relevant ethics committee and the institution name and permit numbers provided at submission.

- **Potential benefits and hazards (second-level heading):** What risks to the subject are entailed in involvement in the research? Are there any potential physical, psychological or disclosure dangers that can be anticipated? What is the possible benefit or harm to the subject or society from their participation or from the project as a whole? What procedures have been established for the care and protection of subjects (e.g. insurance, medical cover) and the control of any information gained from them or about them?

- **Recruitment procedures (second-level heading):** Was there any sense in which subjects might be 'obliged' to participate – as in the case of students,

prisoners, learners or patients – or were volunteers being recruited? If participation was compulsory, the potential consequences of non-compliance must be indicated to subjects; if voluntary, entitlement to withdraw consent must be indicated and when that entitlement lapses.

- **Informed consent (second-level heading):** Authors must include how informed consent was handled in the study.
- **Data protection (second-level heading):** Authors must include in detail the way in which data protection was handled.

Trustworthiness (first-level heading): This refers to the findings of the study being based on the discovery of human experience as it was experienced and observed by the participants.

- **Reliability (second-level heading):** Reliability is the extent to which an experiment, test, or any measuring procedure yields the same result on repeated trials. Without the agreement of independent observers able to replicate research procedures, or the ability to use research tools and procedures that yield consistent measurements, researchers would be unable to satisfactorily draw conclusions, formulate theories, or make claims about the generalizability of their research.
- **Validity (second-level heading):** Validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure. While reliability is concerned with the accuracy of the actual

measuring instrument or procedure, validity is concerned with the study's success at measuring what the researchers set out to measure. Researchers should be concerned with both external and internal validity. External validity refers to the extent to which the results of a study are generalizable or transferable. Internal validity refers to (1) the rigor with which the study was conducted (e.g. the study's design, the care taken to conduct measurements, and decisions concerning what was and wasn't measured) and (2) the extent to which the designers of a study have taken into account alternative explanations for any causal relationships they explore. In studies that do not explore causal relationships, only the first of these definitions should be considered when assessing internal validity.

Discussion (first-level heading): This section normally contains the following four elements. It is suggested that sub-headings are used in this section:

- **Outline of the results (second-level heading):** Restate the main objective of the study and reaffirm the importance of the study by restating its main contributions; summarise the results in relation to each stated research objective or research hypothesis; link the findings back to the literature and to the results reported by other researchers; provide explanations for unexpected results.
- **Practical implications (second-level heading):** Reaffirm the importance of the study by restating its main contributions and provide the implications for the practical implementation your research.

Limitations of the study (first-level heading): Point out the possible limitations of the study and provide suggestions for future research.

Recommendations (first-level heading): Provide the recommendations emerging out of the current research.

Conclusion (first-level heading): This should state clearly the main conclusions of the research and give a clear explanation of their importance and relevance, with a recommendation for future research (implications for practice). Provide a brief conclusion that restates the objectives; the research design; the results and their meaning.

Acknowledgements (first-level heading): If, through your study, you received any significant help in conceiving, designing, or carrying out the work, or received materials from someone who did you a favour by supplying them, you must acknowledge their assistance and the service or material provided. **Authors should always acknowledge outside reviewers of their drafts and any sources of funding that supported the research.**

- **Competing interests (second-level heading):** A competing interest exists when your interpretation of data or presentation of information may be influenced by your personal or financial relationship with other people or organisations that can potentially prevent you from executing and publishing unbiased research. Authors should disclose any financial competing interests but also any non-financial

competing interests that may cause them embarrassment were they to become public after the publication of the manuscript. **Where an author gives no competing interests, the listing will read 'The authors declare that they have no financial or personal relationship(s) which may have inappropriately influenced them in writing this article.'**

- **Authors' contributions (second-level heading):** This section is necessary to give appropriate credit to each author, and to the authors' applicable institution. The individual contributions of authors should be specified with their affiliation at the time of the study and completion of the work. An 'author' is generally considered to be someone who has made substantive intellectual contributions to a published study. Contributions made by each of the authors listed, along the lines of the following (please note the use of author initials):

J.K. (University of Pretoria) was the project leader, L.M.N. (University of KwaZulu-Natal) and A.B. (University of Stellenbosch) were responsible for experimental and project design. L.M.N. performed most of the experiments. P.R. made conceptual contributions and S.T. (University of Cape Town), U.V. (University of Cape Town) and C.D. (University of Cape Town) performed some of the experiments. S.M. (Cape Peninsula University of Technology) and V.C. (Cape Peninsula University of Technology) prepared the samples and calculations were performed by C.S., J.K. (Cape Peninsula University of Technology) and U.V. wrote the manuscript.

References (first-level heading): Begin the reference list on a separate page with no more than 60 references. *Curationis* uses the Harvard referencing style, details of which can be downloaded from the journal website. **Note: No other style will be permitted.**

Manuscript one: Implementation of nurse-initiated management of antiretroviral therapy (NIMART) training: Comprehensive Literature Review

Implementation of nurse-initiated management of antiretroviral therapy (NIMART) training: Comprehensive Literature Review

Sheillah Hlamalani Mboweni¹, MA Cur and Lufuno Makhado¹, PhD

ABSTRACT

Background: Nurse-Initiated Management of Antiretroviral Therapy (NIMART) training was introduced with the purpose of improving the knowledge, skills and competence of nurses in providing comprehensive quality care to people living with HIV (PLWH) and facilitating World Health Organisation (WHO) task shifting where nurses initiate antiretroviral therapy (ART) rather than doctors to meet the increasing demand of ART drugs. The Comprehensive Literature Review (CLR) was used to critic and analyse patterns, trends and gaps or inconsistencies in the current body of knowledge, with the aim of identifying evidence of training strategies that can improve the implementation and deals with challenges that hinders quality.

Methods: The seven steps to comprehensive literature review was used to critically appraise the selected full text studies. The steps were categorized in three phases; namely exploration, interpretation and communication phase. Quantitative, qualitative and mixed methods studies were analysed and synthesized Studies were sought using multiple databases including Cumulative Index to Nursing and Allied Health Literature (CINAHL) (EBSCO), scholar Google. ProQuest, academic journals, SA publications, electronic resources and OAISTER published from January 2012 to February 2017. The initial review of studies yielded 535 results excluding duplications. Screening was done and n=33 articles met the eligibility criteria and were included for quality assessment. The rest were excluded. The selected articles were to answer the following review questions: What is the impact of NIMART/HIV training strategies on HIV management and what are the factors influencing the implementation of NIMART/HIV.

RESULTS: The studies indicate that NIMART OR HIV training is used interchangeably and has the potential to empower nurses with knowledge and skills. It also has a positive impact on increasing ART uptake, however, nurses still lack confidence and competency to provide a comprehensive quality patient centred care. Studies suggest that a shift from the traditional didactics of lectures or slide presentation methods during training to the use of interactive training strategies that stimulate critical thinking in making decisions about HIV care, followed by mentoring and Continuous Professional Development (CPD). Decisive dealing with health system factors negatively affecting implementation has the potential to improve competency and confidence in the implementation of HIV programmes and this will eventually improve the performance of HIV programme indicators.

Conclusion and recommendation: This study reveals that the use of effective training techniques during NIMART training has a positive impact on the learning outcomes, implementation and performance of HIV programmes. The health care system should focus on dealing with barriers that negatively influence NIMART implementation. No framework or model has been identified from the literature related to NIMART or HIV training, therefore a further study is necessary to develop a conceptual framework that guides and strengthens implementation of NIMART training.

Keywords:

NIMART training, impact, HIV management, task shifting, training strategies

Impact of Nurse-Initiated Management of Antiretroviral Therapy (NIMART) Training on HIV management: Comprehensive Literature Review (CLR)

INTRODUCTION AND BACKGROUND

This researcher analysed the process of conducting a Comprehensive Literature Review (CLR) in studies done in Africa and globally, from January 2012 to February 2017, on Nurse-Initiated Management of Antiretroviral Therapy (NIMART) or Human Immunodeficiency Virus (HIV) training. The two are used interchangeably in most literature. NIMART training was introduced in response to World Health Organisation (WHO) recommendations of task shifting to tackle the shortage of skilled health care workers, where nurses initiate ART rather than doctors with the aim of achieving the goal of universal access to comprehensive prevention programmes, treatment, quality care and support globally (WHO 2007:1). However, the implementation of NIMART after training and quality is of serious concern in the North West districts. There is a need to increase access to ART to meet the demand according to the South African guidelines and the current universal test and treat (UTT) policy introduced in September 2016 to achieve the 90-90-90 strategy and eventually better health for all people living with HIV (PLWH).

PROBLEM STATEMENT

The Regional Training Centres (RTC) were established to improve the skills of health care workers in order to respond effectively to HIV and AIDS care. The clinical mentorship programme had been introduced to strengthen the knowledge, skills, competencies and confidence of health care workers after training. In addition, guidelines were developed and reviewed according to research findings as well as in-service training were conducted to promote proper NIMART implementation. However, gaps still exist. This was observed during the quarterly and annual monitoring and review of HIV programmes using ART indicators which included HIV/TB co-infected, ANC pregnant women, new adults and children initiated on

ART and a total number of patients remaining on ART, viral load completion and suppression rate. The general performance of these indicators is fluctuating and no significant impact is observed despite the increasing number of nurses trained and certified competent. Therefore, this prompted the researcher to conduct a systematic investigation of literature to obtain a better understanding of the problem. A Comprehensive Literature Review (CLR) that allowed the integration of a general, traditional or narrative and systematic literature review approach was followed to ensure justification for further research and to address several conceptual and practical advances in science (Onwuegbuzie & Frels, 2016). The flow diagram summarized in Figure 1 of the literature review phases was used.

AIM OF THE STUDY

The purpose of this study was to review literature to obtain a broader perspective of the impact of NIMART training on HIV management and to identify challenges/factors and strategies that can be adopted to improve implementation and again deal with factors hindering implementation. The study also sought to review different methods used to give direction on the methods that would be appropriate for the study.

Research objectives

The objective of the study was to review and analyse primary studies that would provide an in-depth understanding of the facilitation strategies that can be used to strengthen NIMART training, and to improve quality in the implementation and management of HIV programmes.

Review questions

- What is the impact of NIMART/HIV training on HIV management?
- What are the challenges influencing the implementation of NIMART training?
- What are the training strategies used in NIMART /HIV training?

- What are the factors influencing the implementation of HIV?

DEFINITION OF CONCEPTS

Implementation: A process of moving an idea from concept to reality (dictionary). According to Metz and Bartley (2013), implementation is the process needed to bring new practices into widespread use. Within the study, implementation refers to the process of acquiring knowledge and skills obtained from NIMART training to increase access to ARVs and to provide quality comprehensive care through evidence-based practice

NIMART Training: According to national department of health (2011 :), it was nurses who initiated and managed antiretroviral therapy training in order to increase access to ART. This is an organized process or activity of teaching nurses about nurse-initiated and management of ART by imparting knowledge about the HIV and AIDS, Sexual transmitted infections (STI) and Tuberculosis (TB) (HAST) programme, the provision of clinical mentorship to improve practical skills, confidence and competency in the delivery of comprehensive quality care, treatment and support on PHC level

Contribution of the study to NIMART training

This study contributes to a broader understanding of training strategies that can be used by the RTC, facilitators and curriculum developers to improve the knowledge, skills, competency and confidence of nurses to provide comprehensive and quality care to PLWH, including being aware of challenges influencing implementation in the health care system. This will also provide a basis for improvement in training and implementation of NIMART, through the findings and recommendations made by researchers. The study also provides guidance to policy makers and district health care system management teams on ways to deal with challenges affecting the implementation and quality of HIV programmes.

METHODS

The seven steps to a comprehensive literature review (CLR) was used as the methodology for conducting the study. The CLR was used because it allowed the integration of the narrative and systematic reviews hence it is known as a multimodal and cultural approach to literature review (Onwuegbuzie, & Frels, 2016: 24). The Quality Assessment Research Instrument (QUARI) and general traditional narrative review methods were used.

Exploration phase

Initiating the search, storing and organizing information

A manual search using selected terms was conducted with the help of an experienced librarian and researcher to ensure that the studies were critically analysed. The search terms were divided into three words and later combined. Different databases were searched, including CINAHL (EBSCO), scholar Google, ProQuest, academic journals, SA publications, electronic resources and OAISTER. The nominated search terms are shown in Table 1 and databases in Table 2. Both qualitative, quantitative and mixed studies were reviewed for CLR analyses. The search strategy was documented, saved and stored online.

Table 1: Search terms

Search key words	Group
NIMART OR HIV training AND HIV management	1
Impact of NIMART OR HIV training	2
Training and HIV programme performance	3
Combination	4
Total	4

Source: *author's own work*

Inclusion criteria

Literature with the following topics, published between Jan 2012 and February 2017 was included: NIMART OR HIV training, HIV management, factors influencing performance and the impact of NIMART OR HIV training to provide the current knowledge on the training process, identify factors or challenges that hinders performance as well as strategies that can be used to deal with such factors.

Exclusion criteria

The following types of papers were excluded: informal literature surveys with no defined research question or search, data extraction and data analysis process and papers not subjected to peer reviews. When a paper had been published in more than one journal, the most complete version of the study was used. This is to avoid duplication and use studies with reliable, quality and sound information to understand the phenomenon under study.

Table 2: databases and search results identifying the original studies

Databases	Number of original studies
CINAHL (EBSCO)	320
Science direct	56
Expanded Academic ASAP	2
Pro Quest	60
OAISTER	6
Business insight	3
SPORT Discuss	6
SA publications service	37
Cochrane	1
Psych Articles	18
Hein Online	34
SocINDEX	27
No data base	10
SciELO	1
Total	575

Source: Author's own work

*After duplications removed

Selection and deselecting information

After conducting the search, primary or original full text studies were selected using the PICOS review protocol or criteria. These studies were assessed based on participants, phenomena of interest, context and type of studies as indicated in Table 3. The list of rejected studies were compiled indicating reasons for rejection, checked, discussed and agreed upon with an independent researcher. The majority of the studies excluded were abstracts, magazines and newspaper articles.

Table 3: Inclusion criteria according to the PICOS review protocol

Inclusion criteria	Description
Participants	Nurses, students and midwives trained on NIMART or HIV management, patients, documents, literature
Phenomena of interest	Impact of NIMART training on HIV management
Context	Clinical environment in the PHC level initiating ART
Types of studies	Original qualitative and quantitative studies, peer-reviewed and published during 2012-2017

Source: Author's own work

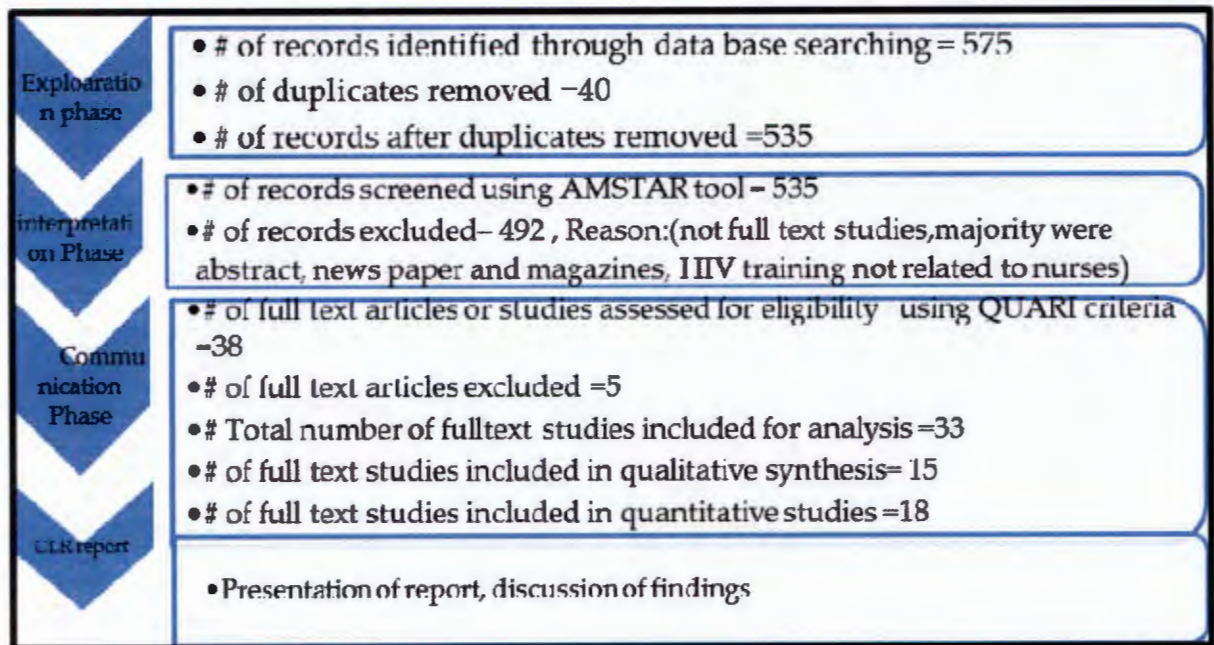


Fig 1: Flow of information through the different phases of the review (Moher et al 2009:3)

RESULTS

Interpretation phase

The interpretation phase of the results presents the analyses and synthesis of the literature reviewed in order to identify factors and strategies that can be used to improve NIMART training and implementation.

Analysing and Synthesis of information

The quality of the quantitative original studies chosen for the review were critically screened using the (QUARI), developed by the Joanna Briggs Institute (JBI) in 2014, as indicated in Table 4. The QUARI has ten evaluation criteria, which include author, name, year, country, and purpose of the study, participants, design, data collection, data analysis and key findings (Munn et al 2014:123). The AMSTAR tool was used for scoring metrics and included in the table. Studies that had scored 5 or less points were excluded from the review to ensure quality. Full text studies were extracted (n=33) and considered for review and analysis. Five were excluded, however they were used in referencing.

Data from each paper was checked by another researcher. Microsoft Excel was used to capture, sort and arrange papers in alphabetical order according to the first authors and duplicates were removed. The data on the table was reviewed to answer the research questions and to identify interesting trends. Thematic analysis was used to synthesize data. Data was coded, categorized and themes were developed.

The studies selected for analysis were conducted in South Africa, USA, Australia, Kenya, Uganda, Nigeria and Central African countries. Most of the studies were from the rural PHC of South Africa (45%), followed by USA (30.3 %%), Australia (3%) and other African countries (15%). The studies used different methods which included quantitative (n=13), qualitative (n=14) and mixed methods (n=6). A total number of 33 studies were reviewed. Participants among the reviewed studies varied from 15-386 and they were mainly nurses, midwives, students, managers in health care, clinical documents, patients and nursing educators. Studies focused on the impact of NIMART or HIV training strategies (n=15), factors influencing NIMART or HIV implementation and management (n=13) as well as those that focused on both training and implementation (n=5). The following themes were developed:

The Impact of NIMART/HIV training strategies on the implementation of HIV programmes

Studies have confirmed that the strategy of nurses initiating ART rather than doctors has a positive impact on increasing ART uptake, although there are still challenges in NIMART training and implementation which affect the performance of HIV programmes as indicated in Table 5. NIMART training can have both positive and negative impacts depending on the strategies used during training (Bluestone *et al.* 2013, Chew *et al.* 2012; Iwu *et al.*, 2014; Ousman *et al.*, 2016). Studies have revealed that nurses feel that NIMART training has empowered them with knowledge and

skills to manage PLWH, however there are still factors that influence implementation, competency and confidence to provide comprehensive quality care. This study's findings show that the use of ineffective, passive, traditional didactics methods of lecturing or slides presentation has no impact on learning and results in inadequate NIMART training. The use of multiple, interactive techniques that stimulate critical thinking to make sound decisions in care is recommended. These strategies include problem-based, reflective and case-based learning, seminar, clinical simulation, group discussions, practice and feedback. It increases knowledge and confidence in caring for PLWH

Some studies have indicated that, in service, onsite or facility based clinical training, continuous professional development, creating a pool of trainers and mentoring have a potential to improve the knowledge, competency and performance of indicators (Davies et al., 2013; Mack et al., 2015; Mbonye et al., 2016; Nyasulu *et al.*, 2013; Oladele et al., 2017, Owens & Moroney et al., 2015). Pre-service training in the institutions of higher learning is necessary to prepare nurses to care for HIV patients immediately when they enter the health care system (Kurth et al., 2016). Additional training on Primary care 101 also has the potential of improving the quality of clinical records and the integration of the management of chronic diseases in the PHC clinics. This includes NCD and ART patients (Mahomed et al., 2015). NIMART training includes paediatric HIV and TB /HIV co-infection management, adverse drug reaction, switching therapy and dealing with defaulters. However, nurses still call the hot line to request assistance in dealing with such cases or refer them to doctors. Very few nurses are competent to initiate ART to children and TB/HIV and some still need more practice and mentoring (Smith et al., 2016; Swart et al., 2013; Kufa et al., 2014). Another gap identified in NIMART is the lack of training in data management, data elements definition, ART, HTS, TB and other registers. This results in over- or under-reporting (Kaposhi et al. 2014). Byakika-kibwika et al. (2015) indicate that inter-professional education, practice, ethics and professionalism

are not emphasized in the clinical years of training and need sensitization including enhancement of mentorship and the use of innovative training strategies.

Table 4: Thematic analysis of the NIMART/HIV training strategies

Theme1: Positive strategies impacting on NIMART/HIV training	Use of Interactive teaching strategies to stimulate critical thinking which include problem based, reflective, case studies and seminars.
	Use of competency-based education and training
	capacity building and training through pre-service
	Onsite training on PC 101 training improves recording and integration of NCDs with HIV
	Onsite continuous facility training on current development and gaps.
Theme 2: Negative strategies impacting on NIMART/HIV training	Continuous professional development and onsite facility mentoring
	Ineffective training methods which include the use of traditional didactics like lecture methods and slides presentation have no impact on learning and implementation.
	A lack of pre-service NIMART training in institutions of higher learning makes students lack skills to manage HIV.
	Inadequate clinical onsite mentoring, partner driven only.
	Inadequate in-service training on current developments
	A lack of continuous professional development (CPD) to improve knowledge and skills.
	Inadequate and unskilled trainers
	Inadequate training period (5 days).
	Unintegrated training curriculum in pre- or service training and education
	Inadequate training on data management, elements definition, clinical registers or stationery.
Inadequate training & implementation of PC 101.	

Source: Author's own work

Factors influencing the implementation of NIMART/ HIV training

Studies have revealed different factors, classified as patient, human resource (HR), environmental and structural/health system factors as indicated in Table 6. Nurses who have been trained on NIMART/HIV are reported to have gained knowledge and skills but face a burden of being overworked by high volumes of patients

demanding ART. This results in exhaustion and dissatisfaction. High staff turnover leading to a shortage of skilled nurses and unverified data by OPM in the facilities affect the performance of indicators (Mark et al. 2015; Davies et al. 2013; Kaposhi et al., 2014; Mbonye et al., 2016; Spies et al. 2016).

The patients' factor also adds pressure to the implementation and management of ART. Studies have indicated that poor adherence to ART or TB treatment is associated with poor outcomes. Patients still have challenges regarding modification of lifestyle, e.g. the use of alcohol and it undermines adherence, leads to risky behaviour, and alters the immune system and the physiological and effective functioning of drugs. Poor adherence was also evident with a high rate of loss to follow up especially patients who were on pre-ART care or wellness and need tracing and link to care (Knight et al., 2015; Kompala et al., 2016)

Some studies have revealed that the health care system or structural factors have negatively impacted NIMART implementation, especially in sub-Saharan Africa, including South Africa. This includes poor integration of services, lack of support, lack of supervision, long waiting hours, inadequate financial resources, equipment and drugs stock outs, supply chain system, overcrowding, staff attitudes, M and E programmes and poor organization of work schedules and processes (Mathibe *et al.*, 2015; Mbonye et al., 2016; Uwimana et al., 2012; Uebel et al. 2013). Gupta and Granich (2016) indicate that only 3 sub-Saharan countries are implementing ART according to WHO guidelines of treatment for all to achieve the 90-90-90 targets, including the universal test and treat policy. Decentralization of NIMART services increases ART uptake in PHC and rural clinics although it also increases workload (Nyasulu et al., 2013; Omole & Semanya. 2016). NIMART is widely practiced and authorized in policy but not reinforced in regulations, e.g. SANC, pre-service education (Zuber et al., 2014). Meintjies et al., (2015) indicates that a review of ART guidelines has resulted in early ART initiation and has public health benefits in

reducing HIV incidences, morbidity and mortality. However, facility based in-service training before implementation and mentoring is needed.

Environmental factors such as stigma, discrimination and staff attitudes impact negatively on NIMART /HIV implementation and management and contribute to poor adherence to treatment. Studies also support that poor infrastructure, a lack of space and overcrowding expose both clients and staff to cross-infection and affect HIV and TB management. Inadequate security poses a risk to staff, drugs and equipment. Poor clinical leadership role models, support and supervision by unit managers in developing student nurses also exist (Ndubuka *et al.* 2016; Walker *et al.* 2010).

Table 5: Thematic analysis of factors influencing the implementation of NIMART/HIV training

Theme 3: Structural or healthcare System factors	Lack of regulation on NIMART
	Inadequate follow-ups and tracing
	Drugs stock-outs
	Long working hours
	Poor work schedules and processes
	Poor integration of services
	Stigma and discrimination
	Inadequate leadership role model
	Poor management support
	Poor clinical supervision
	Poor data management
Theme 4: Environmental factors	Poor infrastructure Not enough space for clients
	Overcrowding
	Not enough space for storing drugs
	Inadequate security Exposure to infection
Theme 5: Health care provider factors	Negative staff attitudes
	Staff overworked/ overburden
	Dissatisfaction
	Lack of confidence
	Shortage of skilled healthcare workers
	Nurses still performing work of pharmacists
	Poor data verification
	Inability to interpret lab results
Poor competence	
High staff turnover	
Theme 6: Patient factors	Poor lifestyle
	Poor Adherence
	Stigma and discrimination LTFU
	Social, Psychological & physical factors

Source: author's own work

DISCUSSION

Communication Phase

Studies have indicated that NIMART training has positively increased ART initiations by nurses, however, there are still challenges to improve training and in dealing with factors hindering quality implementation. Most studies have confirmed that the implementation of WHO recommendations of task-shifting on nurse-led ART programme in PHC has yielded positive impact (Iwu & Holzemer 2014; Uebel et al. 2013). Hence, South Africa has the largest ART programme worldwide with about 3.4 million people (Simelela & Venter 2015). Nurses have been reported to have gained knowledge and skills through NIMART training but gaps still exist with regard to competency, confidence and attitude necessary to sustain patients on lifelong ART and to ensure adherence to achieve VL suppression. This has a negative impact in reducing new HIV and TB infections, drug resistance and death. Findings from this review suggest numerous barriers that have a negative impact on training and recommends various effective strategies to improve, as indicated in Table 4. The review has illustrated consistently that there are a number of factors that continue to impact NIMART implementation and hinder the performance of HIV and ART indicators. These include patient social, physical and psychological factors, environmental, structural or health care systems and human capital factors, as indicated in Table 5. Future studies need to consider identifying and finding ways to deal with barriers and should further develop a conceptual framework that will help to improve NIMART training and implementation as there was no framework in the literature reviewed.

Practical implications

Based on the findings and recommendations of the studies analysed, integration of theory and practice can be practically achieved by means of interactive critical

thinking and training strategies. On the other hand, nurses would improve their decision-making skills and render quality HIV care to PLWH, thus improving the performance of the programme.

Limitations of the studies

The study only focused on full text, reviewed and published studies. Other studies were excluded as they did not comply with the approaches, even though it has valuable information. No conceptual framework or model related to NIMART/HIV training was identified and this support the gap identified by the researcher that there is no conceptual framework or model that guides or support NIMART training and implementation.

CONCLUSION

Although task-shifting and NIMART training have helped to increase ART uptake, more should be done to provide quality care to PLWH and to strengthen adherence, to reduce loss to follow up and to keep them virally suppressed. Again, measures to improve continuity of HIV care should include the use of interactive training strategies that stimulate critical thinking in decision making with regard to HIV care. Dealing with factors that hinders implementation is of great importance and the development of a comprehensive integrated framework is necessary to guide NIMART training and implementation.

Recommendations

The study has revealed recommendations to improve the quality of training using strategies that stimulate critical thinking and integrate theory with practice. It has also introduced NIMART as pre-service training to nursing students, providing continuous in-service training on the current development and dealing with barriers

affecting the implementation of HIV programmes in the PHC facilities to achieve better outcomes.

Funding

The study was funded by NRF and promoted by the North-West University.

Competing interest

There are no financial or personal relationship that may have inappropriately influence us in writing this article.

Acknowledgement

A special thanks to the Librarian for the support, guidance and assistance in literature search.

Author's contribution

S.H.M was responsible for conducting the study which includes; data collection through literature search, analysis and writing the manuscript and L.M for writing and editing the abstract and manuscript for the final submission.

REFERENCES

Byakika-Kibwika, P., Kutesa, A., Baingana, A., Muhumuza, C., Kitutu, F.E., et al. (2015). A situation analysis of inter-professional education and practice for ethics and professionalism training at Makerere University College of health sciences. *BMC research notes*, (2015) 8:598.

Bluestone, J., Johnson, P., Fullerton, j., Carr, C., Alderman, J., & BonTempo, J. 2013. Effective in-service training design and delivery: evidence from an integrative literature reviews. *Human resource for health*. <http://www.human resource health.com/content/11/1/51>. Date accessed: 06 February 2017.

- Chew, D., Jawoskry, D., Thorne, J., Ho, M., et al, 2012. Development, implementation, and evaluation of a student-initiated undergraduate medical education elective in HIV care. *Medical teacher*, 2012 (34): 398-403
- Davies, N., Homfray, M., & Venables, E.C., 2013. Nurse and manager perception of nurse initiated and managed antiretroviral therapy (NIMART) implementation in South Africa: a qualitative study. *BMJ open*, 2013(3): 1-9.
- Friese
- Green, A., de Azevedo, V., Pathern, G., Devies, M.A., Ibeto, M., & Cox, V. 2014. Clinical mentorship of Nurse initiated ART in Khayelitsha, South Africa. A quality of care assessment. *Public library of science*, 9(6): 1-10.
- Gupta, S., & Granich, R., 2016. When will sub Saharan Africa adopt HIV treatment for all? *South African journal of HIV medicine* 17(1): 1-6
- Iwu, E.N., & Holzemer, W.L., Task shifting and HIV management from doctors to nurses in Africa: Clinical outcomes and evidence on nurse self-efficacy and job satisfaction. 2014. *AIDS CARE*. 26(10): 42-52
- Kaposhi, B.M., Mqoqi, N., & Schnopflocker, D., 2014. Evaluation of antiretroviral treatment programme monitoring in Eastern Cape. South Africa. *Health policy and planning*, 2014: 1-8
- Knight, M., Van Zyl, R.L., Samie, I., Basset, J., & van Rie, A. 2015. Impact of combination antiretroviral Therapy initiation on adherence to anti-Tuberculosis treatment. *Southern African journal of HIV medicine* 16(1): 1-6
- Kompala, T., Moll, A.P., Mtungwa, N., Brooks, R.P., Friedland, G.H. & Sheno, S.V. 2016. Impact of nurse delivered community based CD4 services on facilitating pre-ART care in rural South Africa. *Biomed central health services research* 16 (374): 1-8

- Kufa, T., Hippner, P., Charalambous, S., Kielmann, K., Vassall, A., Churchyard, G.J., Grant, A.D., & Fielding, K.L., (2014). A cluster randomised trials to evaluate the effect of optimising TB/HIV integration on patients' level outcomes: The merge trial protocol. *Contemporary clinical trials. PUBMED* 39(2): 280-287.
- Kurth, A.E., Jacob, S., Squires, A.P., Sliney, A., Davis, S., Stalls, S, & Portillo, C.J., 2016. Investing in nurses is a prerequisite for ensuring universal health coverage. *Journal of the association of nurses in AIDS CARE*, 27(3):344-354
- Mack, N., Wong, C., McKenna, K., Lemons, A., Odhiambo, J., et al, (2015). Human resource challenges to integrating HIV pre-exposure prophylaxis into the public health system in Kenya. *African journal of reproductive health* 19(1): 54-62.
- Mahomed, O.H, Naidoo, S., Asmail, S. & Taylor, M., 2015. Improving the quality of nurse clinical documentation for chronic patients at the primary health care clinics: A multifaceted intervention. *Curationis* 38(1): 1-12.
- Mathibe, M.D., Hendricks, S.J.H. & Bergh, A. 2015. Clinician perceptions and patient experience of antiretroviral treatment integration in the primary health care clinics, Tshwane, South Africa. *Curationis* 38(1): 1-11.
- Meintjies, G., et al, 2015. Southern African HIV clinician's society adult antiretroviral therapy guidelines: update on when to initiate antiretroviral therapy. *SA Fr JHIV Med* 16(1): 1-4
- Munn, Z., & Moola, S., Riltano, D. & Lisy, K. 2014. The development of a critical appraisal tool for the use in systematic reviews: Addressing questions of prevalence. *International journal of health policy & management* 3(1) p.123.
- Mbonye, M.K., Burnett, S.M., Naikoba, S., Ronald, A., Colebunders, R., et al., (2016). Effectiveness of educational outreach in infectious diseases management: a cluster randomized trial in Uganda. *Biomed central public health*, 16 (714)

- Moher, M., Liberati, A., Tetzlaff, J., & Altman, D.G. 2009. Preferred reporting for systematic reviews and meta-analysis: The PRISMA statement. *PLoS med* 6(7): 1-6
- National department of health. 2011. Clinical mentorship manual for integrated services. Pretoria, South Africa.
- Ndubuka. N.O., Lim, L.M., van der Walt. D.M., & Ehlers, V.J. 2016. Health related quality of life antiretroviral treatment defaulters in Botswana. *South African journal of HIV medicine* 16(1): 1-6
- Nyasulu, J.C.Y., Muchiri, E., Mazwi, E., & Ratshefola, M., 2013. NIMART rollout to primary health care facilities increases access to antiretroviral in Johannesburg: An interrupted time series analysis. *South African medical journal of HIV* 103(4): 232-236
- Oladele, E.A., Khamofu, H., Asala, S., Safeh, M., Ralph-Opara, U., et al., (2017). Playing the catch –up game: Accelerating the scale-up of prevention of mother to child transmission of HIV (PMTCT) services to eliminate new paediatric HIV infection in Nigeria. *Public library of science*, 17(1): 1-6
- Ousman. K., Polomano, R.C., Seloilwe, E., Odero, T., Tarmo, E., et al, (2016). Inter professional fellowship training for emerging global health leaders in Africa to improve HIV prevention and care: *The Afya Bora consortium. Journal of the association of nurses in AIDS CARE*, 27(3):331-343
- Omole, B.O., & Semanya, M., 2016. Treatment outcomes in a rural HIV clinic in South Africa: Implications for health care. *South African medical journal of HIV medicine* 103(4): 232-236.

- Owens, A., & Moroney, T., (2015). Shifting the load: improving bioscience performance in undergraduate nurses through student focused learning. *Collegian*. 24(2017):37-43
- Onwuegegbuzie, A.J., & Frels, R., (2016). Seven (7) steps to a comprehensive literature review: A multimodal & cultural approach. London, UK: Sage publications.
- Uebel, K., Guise, A., Georgeu, D., Colvin, C., & Lewin, S., 2013. Integrating HIV care into nurse -led primary health care services in South Africa. *Biomed central health services research* 13(171): 2-11.
- Uwimana, J., Jackson, D., Hausler, H., & Zarowsky, C., 2012. Health system barriers to implementation of collaborative TB and HIV activities including prevention of mother to child transmission in South Africa. *Tropical medicine and international health* 17(5): 658-665.
- Shea, B.J., *et al.*, 2007. Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews. *Biomedical Central medical research journal*, 7 (10): 1-7.
- Simelela, N.P and Venter W.D.F. 2014. A brief history of South Africa in response to AIDS. *South African medical journal*, 104 (3): (249-251)
- Smith, J., Oldera, D.N., Chege, D., Muigai, E.N., Patnaik, P., et al, (2016). Identifying the gaps: an assessment of nurses training, competency and practice in HIV care and treatment in Kenya. *Journal of the association of nurses in AIDS and CARE*, 27(3): 322-330.
- Spies, L.A., Gray, J., Opollo, J., & Mbalinda, S., (2016). HIV and Nurses: A focus group on task shifting in Uganda. *Journal of the association of nurses in AIDS CARE*, 27(3):179-182.

Swart, A.M., et al., 2013. Analysis of queries from nurses to the South African HIV&TB health care worker hotline. *South African medical journal of HIV medicine* 14(4): 232-236.

WHO. HIV/AIDS programme strengthening health services to fight HIV/AIDS. Geneva: WHO, 2007.<http://www.who.int/hiv/toroto2056/talkingstocktr>. Date access:

Walker, R., Cooke, M., Henderson, A., & Creedy, D.K., 2011. Characteristics of leadership that influence clinical learning: A narrative review. *Nurse education today*, 31 (1): 743-756

Zuber, A., McCathy, C.F., Verani, A.R., Msidi, E., & Johnson, C., (2014). A survey of nurse initiated and managed antiretroviral therapy (NIMART) in practice, education, policy and regulation in East, central and Southern Africa. *Journal of the association of nurses in AIDS CARE*, 25(6):520-531.

Appendix B

Author Guidelines for Manuscript two and four: International Journal of Nursing Studies (IJNS)

International Journal of Nursing Studies (IJNS) Author Guidelines

Your Paper Your Way

We now differentiate between the requirements for new and revised submissions.

You may choose to submit your manuscript as a single Word or PDF file to be used in the refereeing process. Only when your paper is at the revision stage, will you be requested to put your paper in to a 'correct format' for acceptance and provide the items required for the publication of your article.

To find out more, please visit the Preparation section below.



Introduction

The *International Journal of Nursing Studies* (IJNS) provides a forum for publication of scholarly papers that report research findings, research-based reviews, discussion papers and commentaries which are of interest to an international readership of practitioners, educators, administrators and researchers in all areas of nursing, midwifery and the caring sciences.

Papers should address issues of international interest and concern and present the study in the context of the existing international research base on the topic. Those which focus on a single country should identify how the material presented might be relevant to a wider audience and how it contributes to the international knowledge base. Selection of papers for publication is based on their scientific

excellence, distinctive contribution to knowledge (including methodological development) and their importance to contemporary nursing, midwifery or related professions.

Submission to this journal proceeds totally online and you will be guided stepwise through the creation and uploading of your files. The system automatically converts your files to a single PDF file, which is used in the peer-review process.

Amongst the many submissions received we recognise that some will have been previously formatted for another journal. The Your Paper Your Way service (described later) means that authors can submit these papers to the IJNS without worrying about formatting the manuscript again to exacting specifications.

The IJNS also offers a rapid review service for newsworthy papers under our 4* submission service.

Types of papers

The IJNS publishes original research, reviews, and discussion papers. In addition we publish editorials and letters. Where a case is made we will also publish protocols of trials which meet our general criteria for interest and significance.

Editorials – 1,000–2,000 words

Authors who have ideas for editorials which address issues of substantive concern to

the discipline, particularly those of a controversial nature or linked directly to current/forthcoming content in the journal, should contact the Editor in Chief (ijns@kcl.ac.uk).

Research Papers – 2,000–7,000 words

Full papers reporting original research can be a maximum of 7000 words in length, although shorter papers are preferred. Research papers should adhere to recognised standards for reporting (see guidance below and the Author Checklist).

Reviews and Discussion Papers – 2,000–7,000 words

- Reviews, including:
 - systematic reviews, which address focused practice questions;
 - literature reviews (scoping reviews, narrative reviews), which provide a thorough analysis of the literature on a broad topic;
 - policy reviews, i.e. reviews of published literature and policy documents which inform nursing practice, the organisation of nursing services, or the education and preparation of nurses and/or midwives).
- Discussion Papers, i.e. scholarly articles of a debating or discursive nature.

Letters to the editor – up to 800 words and 10 references, from up to 5 authors

Designed to stimulate academic debate and discussion, the Editor invites readers to submit letters which should refer to and comment on recent content in the journal, introduce new comment and discussion of clear and direct relevance to the journal's

aim and scope or briefly report data or research findings that may not warrant a full paper. Contributions that are of general interest, stimulating and meet the standards of scholarship associated with the Journal may be selected for publication.

Contributions should be submitted as in the usual way.



Before You Begin

Reporting guidelines

The editors require that manuscripts adhere to recognized reporting guidelines relevant to the research design used and require authors to submit a checklist verifying that essential elements have been reported for all primary research and systematic reviews.

Reporting guidelines endorsed by the journal are listed below:

- *Observational cohort, case control and cross sectional studies* - STROBE - Strengthening the Reporting of Observational Studies in Epidemiology, <http://www.equator-network.org/reporting-guidelines/strobe/>
- *Qualitative studies* - COREQ - Consolidated criteria for reporting qualitative research, <http://www.equator-network.org/reporting-guidelines/coreq>
- *Quasi-experimental/non-randomised evaluations* - TREND - Transparent Reporting of Evaluations with Non-randomized Designs, <http://www.cdc.gov/trendstatement/>
- *Randomised (and quasi-randomised) controlled trial* - CONSORT - Consolidated Standards of Reporting Trials, <http://www.equator-network.org/reporting->

guidelines/consort/

- *Study of Diagnostic accuracy/assessment scale* - STARD - Standards for the Reporting of Diagnostic Accuracy Studies, [http://www.equator-network.org/reporting-](http://www.equator-network.org/reporting-guidelines/stard/)

guidelines/stard/

- *Systematic Review of Controlled Trials* - PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-Analyses, [http://www.equator-network.org/reporting-](http://www.equator-network.org/reporting-guidelines/prisma/)

guidelines/prisma/

- *Systematic Review of Observational Studies* - MOOSE - Meta-analysis of Observational Studies in

Epidemiology, <http://www.ncbi.nlm.nih.gov/pubmed/10789670>

Where relevant, more specific extensions to the generic guide should be used, for example:

- **Cluster** Randomised Controlled Trials (where participants are randomised in groups, rather than as individuals) - *Consort 2010 statement: extension to cluster*

randomised trials <http://www.equator-network.org/reporting-guidelines/consort-cluster/>

- *Observational studies using routine data* - RECORD - The Reporting of studies Conducted using Observational Routinely-collected health

Data <http://www.equator-network.org/reporting-guidelines/record/>

You are required to adhere to these guidelines (or a suitable recognized alternative) and to submit a completed checklist from the reporting guideline to assist the editors

and reviewers of your paper. You can search for the correct guideline for your study using the tools provided by the EQUATOR network: <http://www.equator-network.org/> The guideline used must be indicated in the Author Checklist.

Studies reporting on the development of scales, measures or questionnaires

All research papers whose primary purpose is reporting the development or testing of scales / measures / questionnaires must include a copy of the full instrument as a supplementary file at submission stage so it can be published as an appendix online. *The IJNS does not accept instrument development papers which are not accompanied by a copy. We are unlikely to consider papers where there is no validation against a robust criterion, where findings indicate that the version published requires further development or where the underlying constructs are not well established.*

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If the instrument is in a language other than English, then it must be accompanied by an English translation in addition to the original version. If the newly developed scale is a translation of an existing scale then the IJNS requires author(s) to obtain written permission from the copyright owner of the original scale to publish the

translated version with full credit given also to the original scale (an English translation is still also required). *We are unlikely to publish instrument translations from one language to another unless the scale is useful for directly guiding clinical practice (e.g. diagnostic/ screening instruments) related to important and defined outcomes or there is some other clear contribution to the wider international literature from the publication.*

Where questionnaires or existing scales are used as measures to address a substantive question in the paper authors are strongly encouraged to submit the instrument for publication as an online appendix.

Ethics in publishing

The IJNS is a signatory journal to the Uniform Requirements for Manuscripts Submitted to Biomedical Journals, issued by the International Committee for Medical Journal Editors (ICMJE), and to the Committee on Publication Ethics (COPE) code of conduct for editors. Our guidelines should be read in conjunction with this broader guidance. The ICMJE requirements can be found at <http://www.icmje.org/> and the COPE's guidelines at http://publicationethics.org/files/u2/New_Code.pdf.

All studies must be conducted to a high ethical standard and must adhere to local regulations and standards for gaining scrutiny and approval. The work described in your article must have been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving

humans <http://www.wma.net/en/30publications/10policies/b3/>; EC Directive 86/609/EEC for animal experiments http://ec.europa.eu/environment/chemicals/lab_animals/legislation_en.htm. This must be stated at an appropriate point in the article. The approving body and (if relevant) approval number should be identified in the Author Checklist.

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Divide the article into clearly defined sections.

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the manuscript includes page numbers for ease of reference during the review process.

Author Checklist – completed reporting guidelines for the relevant research design.

Covering letter – to the editor in which you detail authorship contributions and other matters you wish the editors to consider.

Contribution of the Paper

All submissions (with the exception of Letters and Editorials) should include "Contribution of the Paper" statements. This should take the form of a clear summary of 'What is already known about the topic?' and 'What this paper adds', identifying existing research knowledge relating to the specific research question / topic and a summary of the new knowledge added by this study. Under each of these headings, please provide clear statements in the form of two or three short bullet points for each. The statements should be placed in the manuscript file between the Abstract and the main body of text, as well as supplied as a separate standalone file at submission.

Do not give general statements in what is known, instead focus on the results of research addressing the same question(s). Do NOT give process statements of what the paper does. e.g. *"This review demonstrates that nurse-led intermediate care reduces hospital stay but increases total inpatient stay"* (outcome) NOT *"This review considers the impact of nurse-led intermediate care on acute stay and total inpatient stay"* (process)

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The statements in the separate file and in the manuscript *should be identical*.

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**Manuscript Two: The Impact of NIMART training on HIV management
in NMM district, North West province (Submitted to *International
journal of African Nursing Sciences*)**

**TITLE: IMPACT OF NIMART TRAINING ON HIV MANAGEMENT
IN NGAKA MODIRI MOLEMA DISTRICT, NORTH WEST
PROVINCE**

Sheillah Hlamalani Mboweni, MA Cur and Lufuno Makhado, PhD

School of Nursing science, North –West University, Mafikeng campus, Mmabatho, South Africa

Address for correspondence author:

Dr Lufuno Makhado

North –West University, Mafikeng campus,

Private bag X 2046,

Mmabatho,

2735

South Africa.

Telephone: (+27) 18 389 2236

Cell: 0845526260/ 0611472002

Email: 22891935@nwu.ac.za

IMPACT OF NIMART TRAINING ON HIV MANAGEMENT IN NGAKA MODIRI MOLEMA DISTRICT, NORTH WEST PROVINCE

ABSTRACT

Background: The purpose of NIMART training is to upscale the capacity of PNs with knowledge, skills, confidence and competencies to provide comprehensive and quality health care services to PLWHIV and thereby improve the performance of the HIV programme. Therefore, this study evaluates the impact of NIMART training on the implementation of the HIV programme to identify gaps and extend best practices.

Objectives: The objective of the study is to determine and evaluate the impact of NIMART training on HIV programme in order to make recommendations leading to effective training and implementation.

Methods: A quantitative descriptive design for programme evaluation was used to examine the impact of NIMART training on the implementation of the HIV programme. The study was conducted in rural districts of the North West province. A stratified simple random sampling method was used to select n=10 PHC fixed clinics and community health centres that met the inclusion criteria. Five sub-districts were selected to participate in the study to allow a greater degree of representativeness. The statistics of ART indicators were collected from the DHIS from January 2012 to December 2016. These ART indicators have been measured against the number of PNs trained on NIMART. Descriptive statistics were used to analyse data.

Results: The study results revealed ineffectiveness in the implementation of NIMART training programme and inefficiency in the management of HIV as there is no steady increase of new ART initiation in adults, children, and ANC pregnant women and below 90%, despite 99% of PHC selected facilities having 75% on PNs

trained on NIMART, 42.8% were not certificated for competence and only 23 % not trained, including the changes in eligibility criteria for treatment, introduction of Option B+ and UTT in September 2016. Sustainability of patient on ART is poor as the study results revealed fluctuation in both adults and children TROA and high LTFU at an average of 14%. Again, of Viral load collection (54%) and Viral load suppression (56%) rate at 12months after ART initiation is far below the 90% target and had negative impact on patient treatment outcomes including decanting of stable patients out of the overcrowded facilities. However, adult patient death after 12 months of starting treatment declined.

Conclusion and Recommendations:

There is a significant impact of NIMART training on HIV management regarding increased access to PHC facilities. However, challenges still exist that reveal poor quality of HIV management, non-compliance to guidelines and monitoring of treatment effectiveness despite PNs trained on NIMART. Challenges or barriers that lead to the identified gaps need to be investigated in order to make recommendations that strengthen NIMART training and implementation.

Key words: NIMART- Nurse initiated management of anti-retroviral therapy training, HIV programme, Impact, PHC facilities, Professional nurses

IMPACT OF NIMART TRAINING ON HIV MANAGEMENT IN NMM DISTRICT, NORTH WEST PROVINCE

Introduction and Background

The dual burden of human immune deficiency virus (HIV) and tuberculosis (TB) is a global concern. Both demand antiretroviral therapy (ART) initiation to manage and control the dual epidemic. There is also a dire need for a prevention strategy for mother to child transmission (PMTCT). According to WHO (2013), there are approximately 36.9 million people living with HIV (PLWH) worldwide of which 16.8 million were women; 3.4 million were children and adolescent less than 15 years old. In the same report 1.8 million deaths related to acquire immune deficiency syndrome (AIDS) were reported. The Sub Saharan region is the most affected with 25.8 million that account for 70% of HIV cases globally and 1.2 million deaths with South Africa having the largest population of PLWH at 6.4 million, 340 000 new HIV infections, 200 000 AIDS related deaths. South Africa ranks as the third highest burden in TB in the world in 2013 (UNAIDS, 2014). The increasing number of PLWH in need of ART exerts more pressure on the health care system that is already experiencing a dire shortage of resources and high staff turnover (Ousman et al., 2016). According to Simelela and Venter, (2014), shifting of tasks was adopted in South Africa and training on nurse-initiated management of ART (NIMART) was introduced in 2009 to improve access to ART by training 75% of the PNs from the PHC facilities. The researcher investigated the impact of the NIMART training on HIV management and proffers recommendations that seek to strengthen training strategies and implementation.

According to WHO, (2012), the prevalence of HIV remains high at 19.1% among the general population and very high in key population globally although there is slight decline of 0.8% since 2000 from 38.1 million to 36.9 million in 2014. Only 37% of adults and 24% of children living with HIV received ART world wide. Consequently, the prevalence of TB and HIV co-infected cases is also increasing,

adding to the burden in the management of HIV and TB. In 2012 there were 9.6 million new TB cases of which 1.2 million were among PLWH globally. In Sub Saharan Africa, PLWH who know their status are at 45%, those receiving ART 39% and those with suppressed viral load at 29%. All these high figures raise a lot of concerns regarding HIV management (UNAIDS, 2014). In South African HIV prevalence in the general population is still increasing at 6 595 232 with only about half of that number initiated on ARV, thus leaving 3 103 902 9 (47.1%) PLWH on ART, even though there is a decline among children due to PMTCT programme that has reduced mortality by 20%. The life expectancy at birth is still below target of 70%; with females at 64.3% and males at 60.6 % (Day & Gray, 2015).

According to Day and Gray (2015) and NWPoH (2016), the prevalence of HIV in the NW province has declined slightly by 0.8% from 30.0% in 2011 and 28.2%. There is no respite in the life expectancy at birth which is below 70%, males at 49.9% and females at 54.3%. Death related to HIV is still principal cause at 4.8%; the incidence of Pulmonary TB (PTB) in PLWH infection is increasing while ART initiation and the number of PLWH remaining on ART is decreasing. The increasing number of PLWH and demand for ART has a serious impact on the South African health care system that is already experiencing shortage of human, financial, material resources and poor infrastructure (Sifanelo & Theron ,2012; WHO, 2007). Apart from the measures and strategies introduced in South Africa to improve access to ART and management of HIV programme, gaps still exist that have led to poor performance of the programme in Ngaka Modiri Molema District in the NW province. These gaps are attributed to PNs who are either not implementing what they have been trained or not complying with changes of NDoH policies and guidelines. This could also be attributed to PNs not recording, not reporting accurately, not being mentored efficiently or basically incompetent to initiate and manage ART. Another cause could be that there is poor data management or set targets are too high in relation to PLWH eligible for ART. These factors require an evaluation of the performance of

HIV programme after training in order make recommendations directed at improving NIMART training and implementation. Approximately 94% of professional nurses (PN) in Ngaka Modiri Molema district of the NW province have been trained on NIMART since 2011. Clinical mentorship was provided in the facility level and all PHC fixed facilities initiating ART (Skill Audit, 2014). A post training assessment was conducted by the regional training centre (RTC), to evaluate the effectiveness of NIMART using the DHIS statistics on ART indicators from facilities after 12 months period (2012-2013). The results showed no marginal increase or effect on the facility performance as compared to pre-training. An observation was also made during district performance monitoring reviews for 2015/2016 and it was identified that the HAST priority programmes performance is very low, yet these are key drivers in achieving a long and healthy life for all South Africans. Such are the goals and objectives of 2012/2016 NSP and therefore there was some alarm raised with respect to the perceived low impact of NIMART. New patients initiated on ART, which include adults and children at 59% instead of a target of 91.6%, TB/HIV co-infected clients initiated on ART were recorded at 820 while there are 1804 TB clients who are HIV positive were identified in the register. Ante natal care (ANC) clients initiated on ART were recorded at 72.2% instead of the target of 95%. Various strategies have been introduced to improve NIMART training and implementation though there are gaps that still exist. The performance of HIV and TB programme is still poor. Hence the researcher was motivated to conduct a detailed study to answer the following question:

- What is the impact of NIMART training on HIV management?

The outcome of this study is used to develop questions that further explore challenges that contribute to such low and ineffectual outcomes in Phase 2 and later used to develop a conceptual framework that provides guidance to strengthen NIMART training and implementation and thus holistically improve the performance of HIV programme. The purpose of the study is to evaluate the impact

of NIMART training on HIV management in order to identify gaps and make recommendations that improve the quality of care to PLWH in NMM district, North West Province. The study aimed at achieving the following objectives and answer the research questions of the study:

- To analyse the performance of the HIV programme and determine the impact of NIMART training in the PHC facilities in NMM district.

The study findings and recommendations contribute significantly to the improvement of NIMART training in achieving its intended objectives of producing skilled nurses who can provide quality comprehensive individualized care to PLWH rather than high quantity. This also adds to compliance to policies and guidelines set out to reach the outcomes of the HIV programme.

Materials and methods

Research design

A descriptive programme evaluation research design was used in the study to examine the impact of NIMART training on HIV management. Programme evaluation research refers “to an applied system of scientific methods used to measure or assess the implementation, conceptualization, design, utility and outcomes or impact of social programmes for decision making purposes”, and this is very useful in mixed methods (De Vos et al. 2011: 94). The aim of the design is to determine the effectiveness of the NIMART training programme in producing an efficient and sustainable HIV management in order to achieve the intended results.

The planned targets cover the following: 75% of PNs in the PHC facility be trained on NIMART and 90% of the people diagnose with HIV infection are on sustained ART. The strategic objectives include, but not limited to, Increased ART initiation to all people living with HIV (diagnosed). The ultimate goal-oriented outcomes of effective NIMART training process is to produce knowledgeable, skilled, confident and

competent professional nurses who will efficiently implement the ART programme with a view to improve the health status of PLWH.

Sampling and context of the study

The population of the study includes all NMM district fixed PHC facilities (N=94). The management of HIV programme and NIMART training was decentralized from the provincial level to the district health care system (DHS), fixed PHC facilities to increase access ART, supported by DCST and developmental partners. Patients with complications are referred to district, regional and tertiary hospitals for specialized care. The Regional training Centre (RTC) played a major role in capacity building of PNs to manage PLWH. The study was conducted from the five (5) CHCs and 5 PHC clinics from a predominantly rural district of the NW Province. The district is divided into five (5) sub-districts or local municipalities with 94 PHC facilities (clinics and CHCs) initiating ART (NDoH, 2015). There are 476 PNs and 447 (94%) trained in NIMART (Skill audit, 2015) distributed across the five centres.

Inclusion criteria: Every facility with PNs trained on NIMART was included. A stratified simple random sampling method was used to select CHCs and clinics that meet the inclusion criteria. Facilities were grouped per sub district, classified as CHCs (14) and PHC clinics (80), categorized in rural, semi urban and urban areas, to ensure a greater degree of representativeness and reduce error. A list was compiled and every fourth CHC and fifth clinic per category was selected. A total number of n=10 facilities were part of the study (Groves et al. 2013; Babbie & Mouton, 2011).

Data collection methods

Data was collected from secondary sources, specifically the statistics from the DHIS January 2012 to December 2016 and the following variables were measured:

- Adult commenced on ART during this month – naïve;
- Child under 15 years started on ART during this month – naïve;
- ANC pregnant women initiated on ART.
- Number of PN trained on NIMART from RTC skills audit report 2015/16

Data analysis

Descriptive statistics were used to determine the number of PNs trained on NIMART and those initiating ART, cross-tabs was used to describe the target of the indicators on ART initiation and actual performance of facilities and the relationship between NIMART training and performance of the HIV programme was established using the correlational co-efficient test.

Reliability and validity of the study

Reliability refers to the consistency with which an instrument measures what it purports to measure (Babbie & Mouton, 2011). Data was collected from an already existing secondary source, which is the district health information system (DHIS) and Tier.net. The validity of this study is assured in that it measures the truth or accuracy of the claim (Grove et al. 2013). Face validity was maintained by using the national indicators data sets (NIDS) used to monitor the progress of the HIV programme. Content validity was maintained by ensuring that the statistics used was verify, validated and cleaned up before use by data management experts. All NMM PHC fixed facilities were grouped per sub district and randomly selected to ensure a greater degree of representativeness and allow for the generalization of the results to the entire district. There is no risk of subject attrition as the study involves only statistics

Results

NIMART training coverage

The results of this study show that 99% of the selected facilities have 75% of the PNs trained on NIMART, in line with the RTC target. The majority are from the rural areas of the district, except one CHC at 58.8%. However, there is still 23% of PNs who are not trained from the selected facilities and 42.8% that are not certificated for competency and need to be targeted for competency training.

Table 1 represents the NIMART training coverage of the selected facilities.

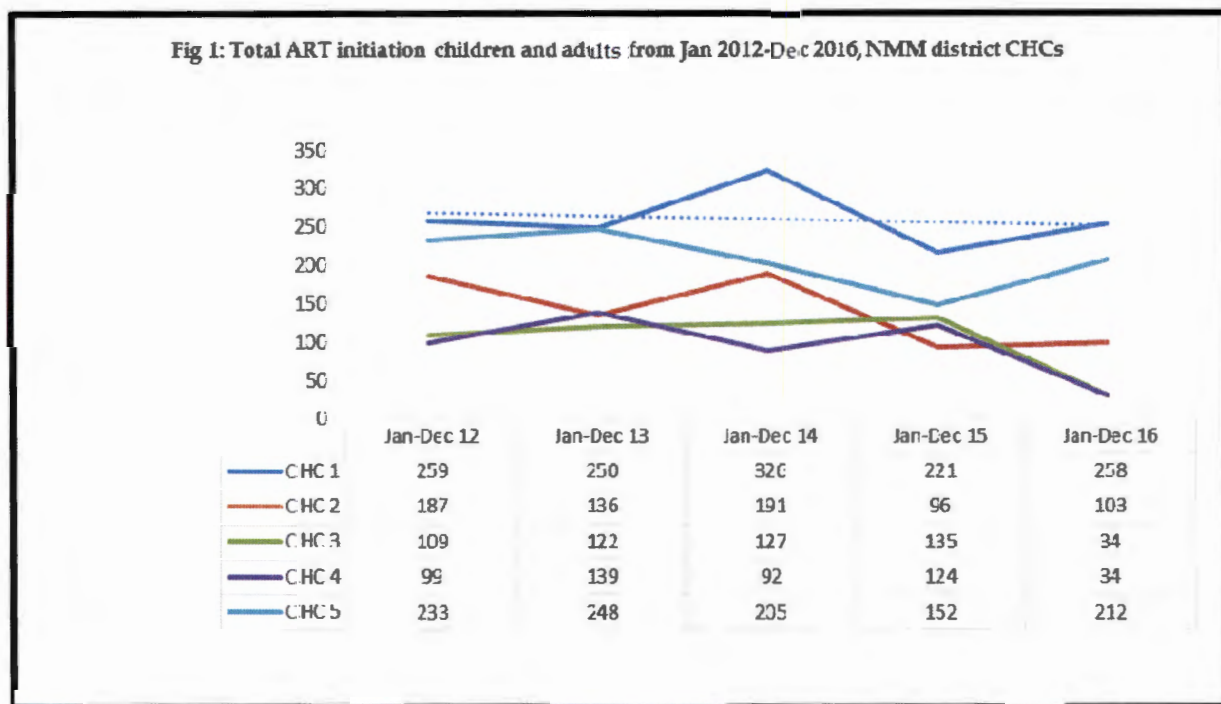
Sub district	site	Facilities	Total PNs in the facility	PNs trained on NIMART	PN not trained on NIMART	PNs Initiating ART	PNs certificated	PNs Not certificated for competency on NIMART
1	U	CHC 1	17	13(76%)	4(23.5%)	13	9	4(30.7%)
.	R	Clinic 1	13	10 (77%)	3(23%)	10	7	3(30%)
2	R	CHC 2	15	14(93%)	1(6.6%)	14	11	3(21.4%)
	R	Clinic 2	2	2(100%)	0	2	0	2(100%)
3	SU	CHC 3	12	9(75%)	3(25%)	9	3	6(66.6%)
	R	Clinic 3	4	3(75%)	1 (25%)	3	0	3(100%)
4	SU	CHC 4	8	6(75%)	2(25%)	6	5	1(16.6%)
	R	Clinic 4	2	2(100%)	0	2	1	1(50%)
5	SU	CHC 5	17	10(58.8%)	7(41%)	10	4	6(60%)
	R	Clinic 5	1	1(100%)	0	1	0	1(100%)
Total			91	70(76.9%)	21(23%)	70(76.9%)	40(57.1%)	30(42.8%)

Source: skills audit report, RTC 2016 R*rural. SU*semi urban, U*urban

NIMART implementation

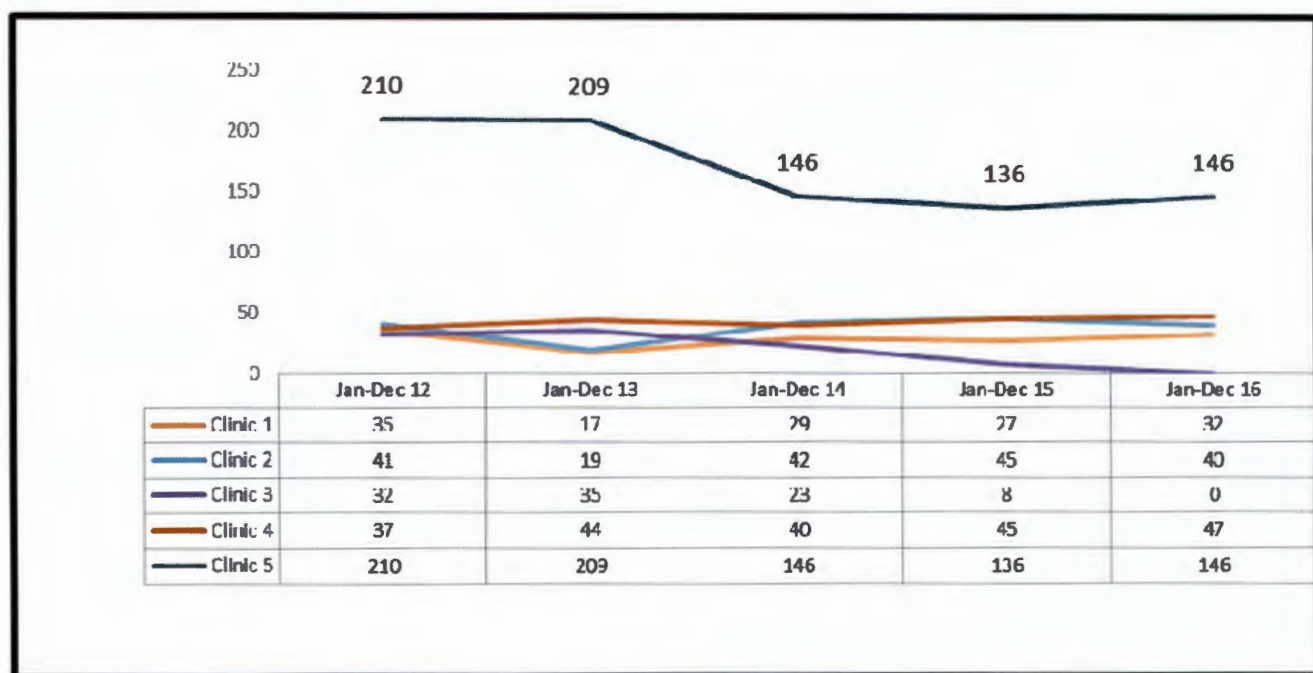
Total adults and children under 15 years started on ART

Focusing on the randomly selected CHCs in the NMM district, new ART initiation in adults and children is fluctuating as represented in Figure 1. There is no significant spike observed since 2012. The data-run profiles are approximately similar in terms of peaks and valleys, and one run is not consistently higher or lower than the other years in comparison. A serious decline was observed in 2014 in all CHCs yet they have PNs trained on NIMART. The figure also shows that CHC 1 has (76 %), CHC 2 (93%) only, while CHC 5 has a low number of PNs trained on NIMART (58.8%), contrary to the prescripts of the new ART initiation that showed an increase in 2016. This suggests that best practices should be explored to assist poor performing facilities. CHC 3 recorded 4 new ART initiations and these are still declining yet both have 75% of PNs trained on NIMART. There is therefore a need to investigate the causes of such a discrepancy.



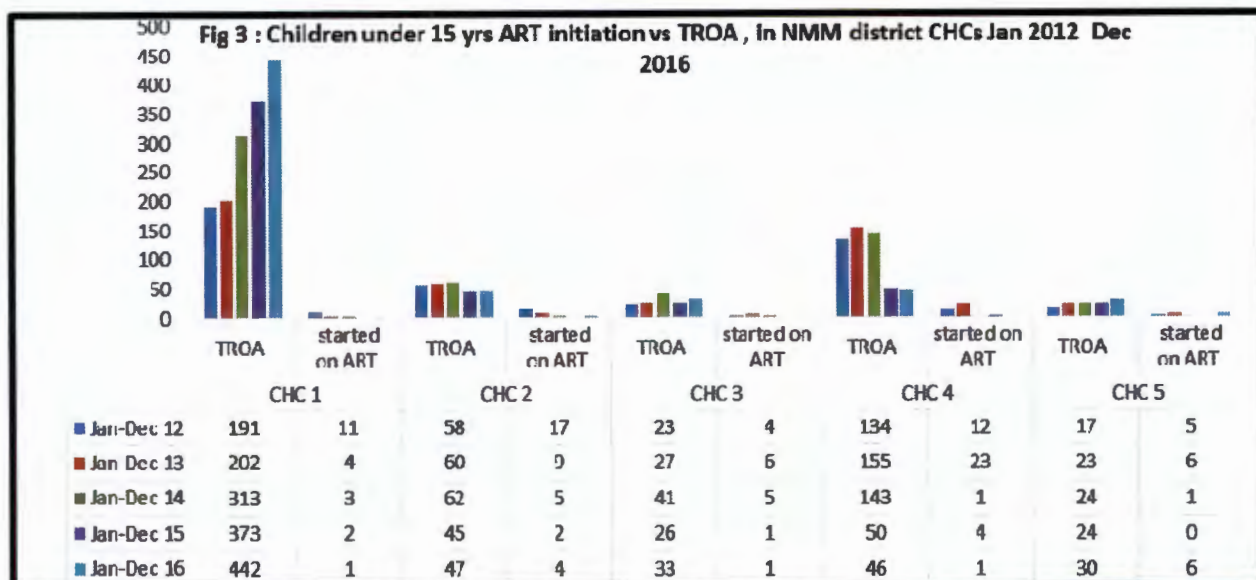
A similar performance is observed in selected PHC clinics as represented in Figure 2. Total ART initiation in both adult and children appears insufficiently range-bound to be counted as not a credible reflection of low initiations, while all PHC clinics are above 75% coverage with regard to NIMART training. There is no indication of steadily rising NIMART even after introduction of UTT in 2016. The worst situation

was identified in clinic 3 at 0 initiations yet staffed with 75% of PNs trained on NIMART and this case should be further investigated. Clinic 2, 4 and 5 are at 100% coverage although they are not all assessed for competency and the reasons for this gap should be identified. Clinic 2, 3 and 5 all have PNs trained and have been assessed and certificated for competency, but clinic 4 at 50% and clinic 1 at 30% are cases that call for further investigation.

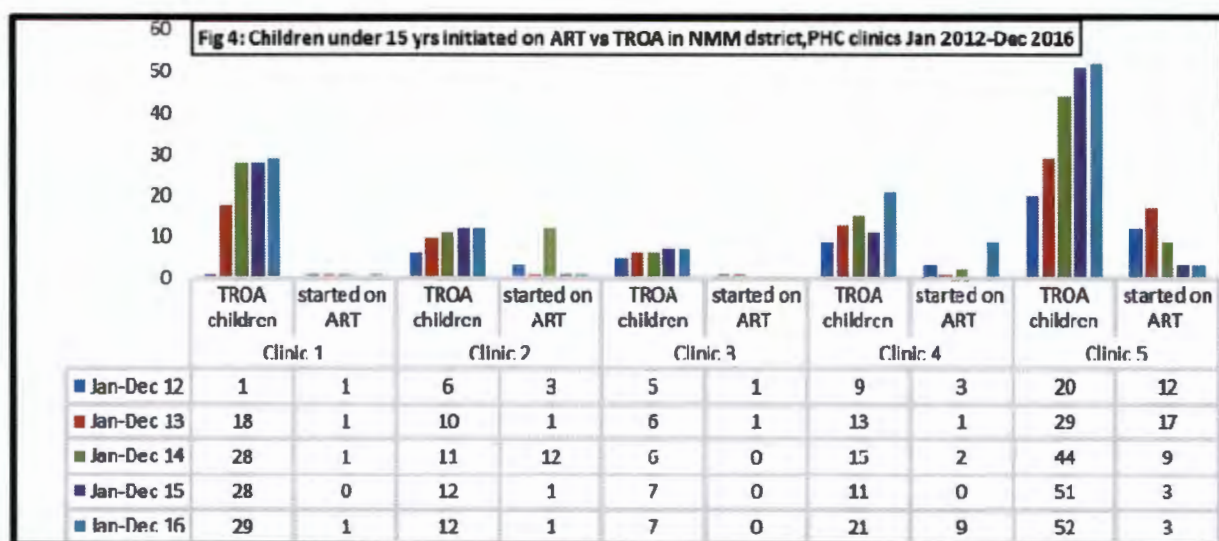


Total Children under 15 years ART initiation

Figure 4 represents new ART initiation in relation to TROA amongst children under 15 years. Number of children initiated on ART is very low in relation to TROA and raises questions of where they were initiated. The children might either be initiated in hospitals by doctors. TROA amongst children is fluctuating, and there might be other factors that need to be investigated, like defaulting treatment, poor adherence, and lack of disclosure that could all in combination or singly further expose them to drug resistance. All this needs to be investigated for confirmation. ART initiation amongst children was expected to increase since 2013 due to the concerted implementation of the PMTCT reviewed guidelines and UTT in 2016 in contrast to the performance displayed which is markedly different.

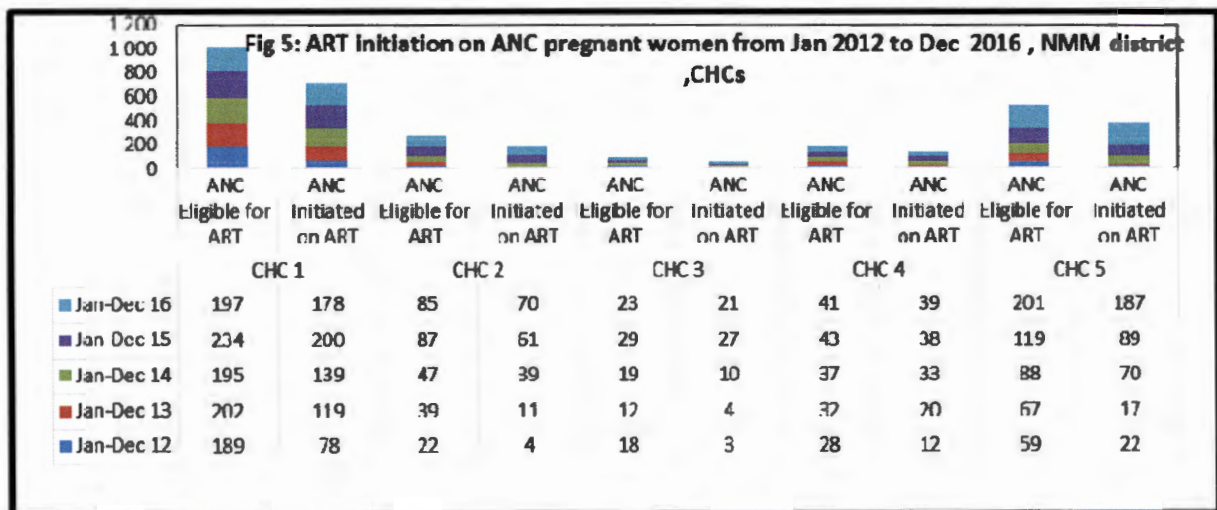


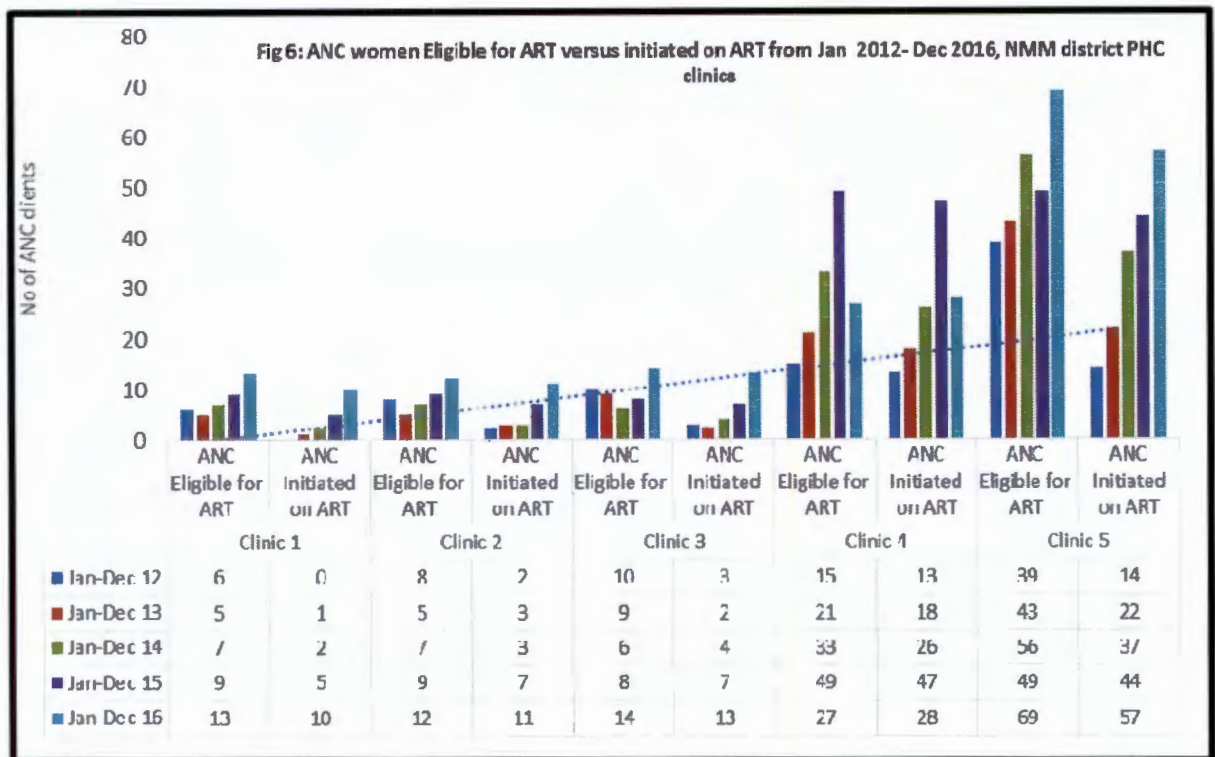
ART initiation in children under 15 years from all sampled CHCs and PHC clinics as represented in Figure 4 and 5 is very low and below target, despite changes in eligibility criteria, implementation of PMTCT option B+ in 2013. UTT and the competency of PNs, mentorship in paediatric HIV management or training should be evaluated. The results in this chart reflect that the pool of those infected under the age of 15 years who are not on ART is gradually decreasing. This could be a positive development in that the numbers who need to be on ART are decreasing, or it may reflect a decrease in younger cases because of better performance in ANC for PMTCT over the past few years.



ANC pregnant women initiated on ART in the selected CHCs

The general performance of ART initiation in ANC pregnant women in the selected CHCs and PHC clinics as presented in Figure 5 and 6 also shows great improvement in most facilities since 2013, even though the number of pregnant women initiated on ART is lower than those tested positive or eligible for ART. Initiation rate were identified as follows: CHC 1(90%), CHC 2 (82%), CHC 3 (91%), CHC 4(95%) and CHC 5 (93%) in 2016. All facilities did not achieve 100% in ART initiation although majority are above 90% target. This set of indicators suggests that more babies are likely to be exposed to HIV infection.





HIV testing services versus ART initiation

HTS is fluctuating in most CHCs as displayed in Table 1. In CHC1 both HIV testing, HIV +ve clients and ART initiation reveal fluctuating trends while Positivity yield is decreasing. CHC 2 testing is increasing while those +ve and ART initiation is fluctuating, and Positivity yield decreasing. CHC 3 and 5 show that both testing and +ve are fluctuating, positivity yield increasing while ART initiation is decreasing. CHC 4 HIV shows that testing and +ve are fluctuating, ART initiation is decreasing and +ve yield decreasing. There is no relationship between the number of patients tested positive and those initiated on ART. HIV Counselling skills for lay counsellors should be assessed and taken into consideration including the facility patients flow and referral systems for treatment. The target group being tested and positivity rated needs to be investigated for proper intervention.

With regard to geographical location, CHC 1 is found in urban area, HIV testing is high although fluctuating while positivity rate is low and decreasing to 8% in 2016. The fluctuation might be a result of people moving in and out looking for jobs and better conditions or this might suggest that the key population is not targeted or

mobilized for such screening. CHC 2, is a rural centre where HIV testing is high and increasing but positivity rate is recorded as low at 9% in 2016. CHC 3 is located in a semi-urban area, characterised by low HIV testing and fluctuating but high positivity rate. CHC 4 also is located in semi-urban area, HIV testing low but increasing while positivity rate is high. This is likely to be associated with social problems that expose people to HIV such as poverty and unemployment.

Table 1: HIV testing versus ART initiation in NMM district PHC CHC

Sub-district	Facilities	HTS all ages	Jan- Dec 12	Jan- Dec 13	Jan- Dec 14	Jan- Dec 15	Jan Dec 16	Total
1	CHC 1	HIV Tested	3 177	3 765	4 122	4 723	4 589	20 376
		HIV +ve	419	392	449	399	359	2018
		Total						
		Initiated	259	250	326	221	258	1 314
		Yield	13	10	11	8	8	51
2	CHC 2	HIV tested	1 111	1 673	1 723	1 803	2 211	8521
		HIV +ve	239	263	299	194	201	1196
		Total						
		Initiated	187	136	191	96	103	713
		yield	22	16	17	11	9	74
3	CHC 3	HIV Tested	749	603	849	895	501	3597
		HIV +ve	219	189	209	192	258	1067
		Total						
		Initiated	109	122	127	135	34	527
		yield	29	31	25	21	51	158
4	CHC 4	HIV Tested	503	488	591	607	678	2867
		HIV +ve	179	191	122	104	111	707
		Total						
		Initiated	99	139	92	124	34	488
		yield	36	39	21	17	16	129
5	CHC 5	HIV Tested	1 122	1 599	1 879	2 088	2 322	9010
		HIV +ve	199	319	352	409	489	1768
		Total						
		Initiated	233	248	205	152	212	1050
		yield	18	20	19	20	21	97

Source: DHIS & Tier.net February 2017

The findings from the evaluation of the implementation of HTS in NMM PHC clinics as indicated in Table 2 are different to CHCs. The HIV testing in all clinics is low but not related to the population served or head count and clinics not meeting their target, while the positivity yield is high above 12% and needs serious attention. In NMM district nursing assistants and a few enrolled in health care are trained on HIV counselling and testing but the coverage is still low. Geographically, most PHC clinics are located in rural areas while most CHCs are in urban and semi urban areas. This is attributed to high head count and population in urban and semi urban areas or people moving from rural to urban areas for better services.

Table 2: HIV testing versus ART initiation in NMM district PHC clinics

Sub-district	Facilities	HTS all ages	Jan-Dec 12	Jan-Dec 13	Jan-Dec 14	Jan-Dec 15	Jan-Dec 16	Total
1	Clinic 1	HIV Tested	289	292	282	345	339	1 547
		HIV Tested Positive	51	35	47	38	47	218
		Total	35	17	29	27	32	140
		yield in %	18	12	17	11	14	71
2	Clinic 2	HIV Tested	399	273	297	304	312	1 585
		HIV Tested Positive	59	55	53	59	49	275
		Total	41	19	42	45	40	187
		yield in %	15	20	18	19	16	88
3	Clinic 3	HIV Tested	117	121	133	191	189	751
		HIV Tested Positive	47	43	37	29	34	190
		Total	32	35	23	8	0	98
		yield in %	40	36	28	15	18	137
4	Clinic 4	HIV Tested	300	297	201	199	320	1 317
		HIV Tested Positive	65	46	71	66	88	336
		Total	37	44	40	45	47	213
		yield in %	22	15	35	33	28	133
5	Clinic 5	HIV Tested	1 167	1 357	1 978	1 859	1 972	8 333
		HIV Tested Positive	304	340	297	202	301	1 444
		Total	210	209	146	136	146	847
		yield in %	26	25	15	11	15	92

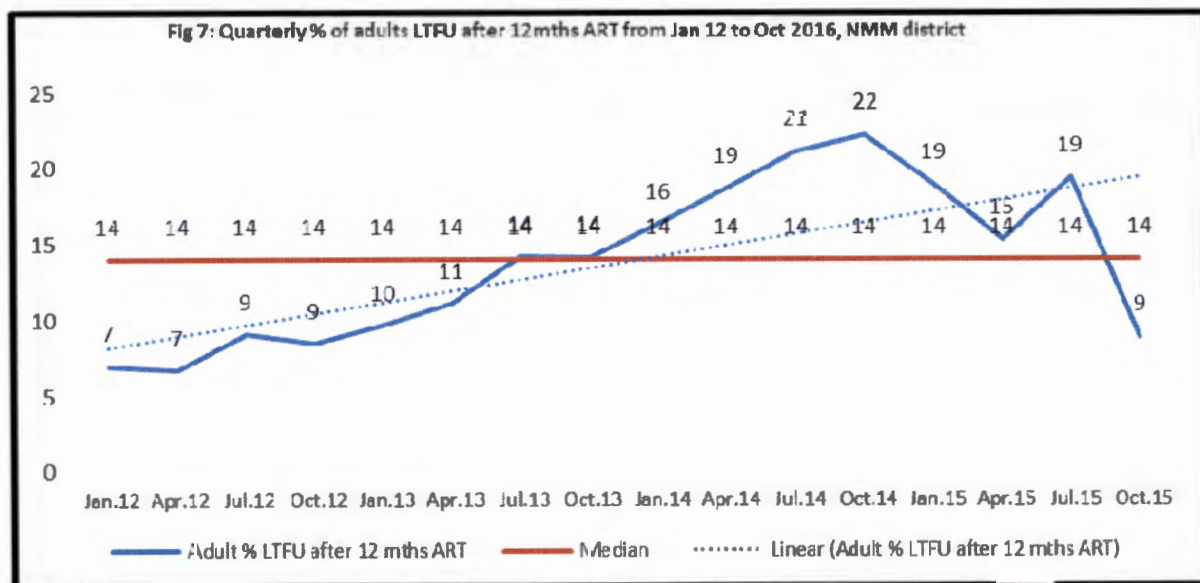
Source: DHS & tier.net February 2017

NMM District additional tracer indicator to monitor the quality of ART management

Additional tracer indicators of monitoring VLC, VLS, LTFU and death were analysed to obtain a clearer picture of the impact of NIMART training on patients receiving ART.

Adults lost to follow up rate after 12 months of ART initiation

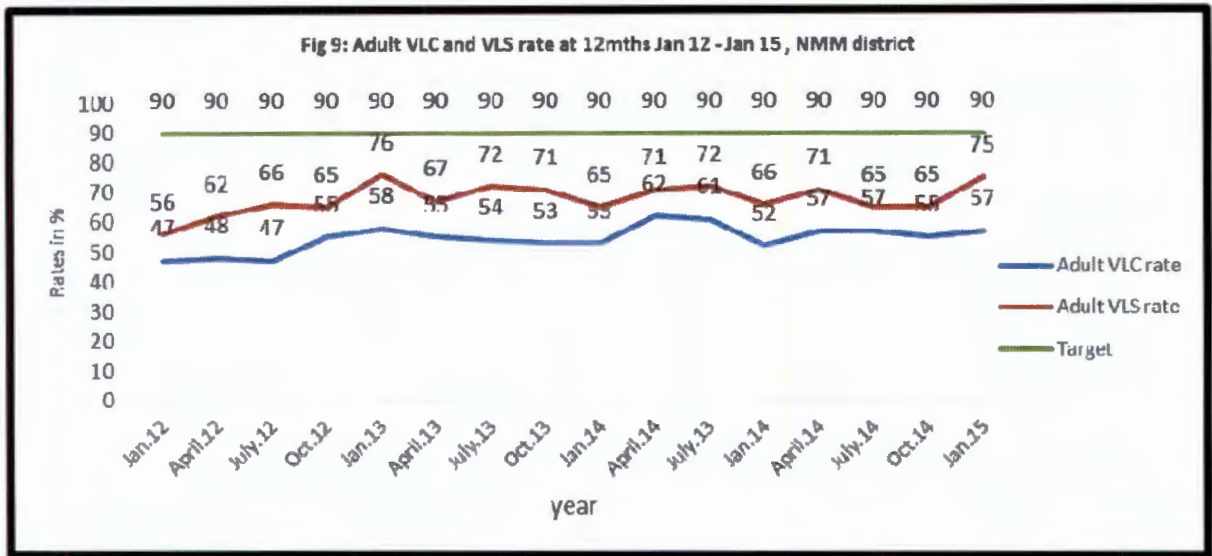
Figure 7 represents the percentage of adults lost to follow up after 12 months of ART initiation and this peaks at an average of 14% against the target of 10% or less. Adherence counselling should be evaluated and strengthened as this affects collection of VL to monitor suppression and how such adults respond to treatment.



Viral load completion rate in NMM district

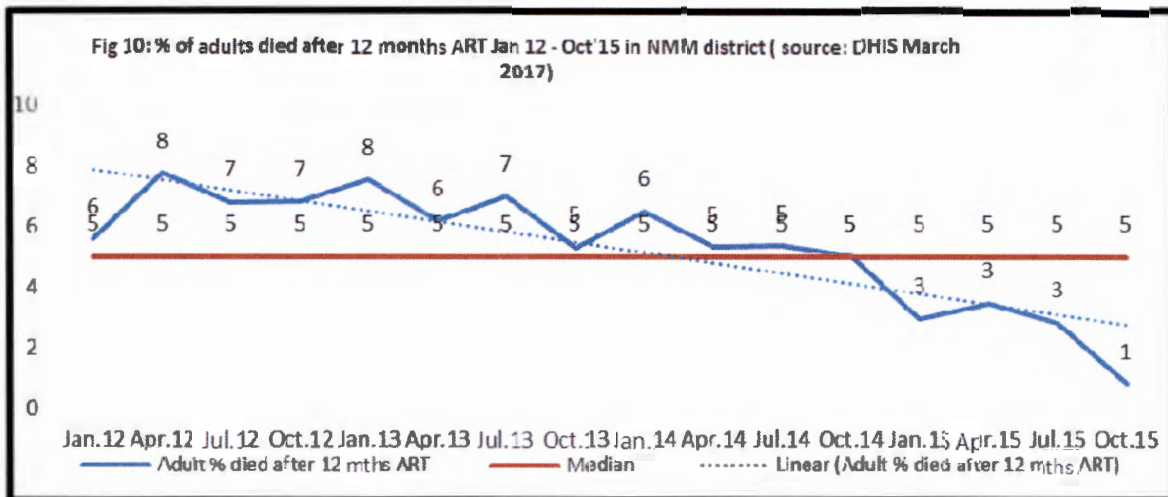
Figure 8 represents VLC and VLS rate and reveals VLC is relatively low in all the years at an average of 54%, a noticeable increase in VLC is evident in 2014 whereas a noticeable decline is also evident in 2015. Challenges need to be investigated. Facilities are overcrowded, there are long waiting periods and health care workers

are significantly overworked, all compounding the complexities and challenges of implementing and adherence to the national adherence guideline (AGL) decanting strategies of CCMDD, fast lane or adherence clubs and relieving the health care system and workers as most clients VL are not monitored or not suppressed at the average of 56% displayed. Patients who are not responding well to ART drugs are not monitored and identified early for switching or change regimen or transfer for advanced clinical care.



Percentage of adult death rate after 12 months of treatment

Fig 10 represents the quarterly tracer indicator of percentage of adults’ death rate after 12 months of starting ART treatment. An average of 5% of adults died quarterly although this shows a patent decrease and is a serious challenge that needs to be investigated. This is related to VL collection and monitoring to determine if the client is responding well to treatment, to either switch or change or deal with adherence issues. Poor compliance in the implementation of guidelines by PNs or shortage of drugs might be a problem or high rate of LTFU.



Discussion

The impact of NIMART training on HIV management is evaluated using the HIV indicators. The data was collected from the DHIS, which is a reliable government information system supplemented by data from *Tier.net*. The NIMART training coverage of both PHC clinics and CHCs is on target of 75% and above, except one CHC. However, inefficiency in the implementation of HIV programme is evident by study findings that revealed low or no steady increase in new ART initiation amongst adults, paediatric and ANC pregnant women eligible for ART even after the introduction of Option B+ policy in 2013, that directs pregnant women and children under the age of 5 years should be initiated on ART irrespective of CD4 count, including the introduction of UTT policy in 2016 (NDoH, 2014 & 2015) and its implementation. NIMART nurses do not comply with policies and guidelines for HIV management. A study conducted in Haiti on expansion of ART programme had similar outcomes (McNairy et al. 2017). This might suggest that the NIMART training is not effective enough to equip PNs with the necessary skills, confidence and competency to initiate and manage ART patients and needs further investigation to make sound conclusions. Majority of the selected facilities fail to reach 90% of the NDoH ART initiation target. According to Theuring et al. (2014), ANC pregnant women are missed while attending the clinic, poor compliance to

guidelines and late booking together contribute to low ANC ART intake and exposes infant to HIV infection.

Adult ART initiation is better, but the HTS results revealed that there are still HIV positive clients that are not initiated on ART while facilities have enough PNs trained. Studies conducted by Baloyi et al. (2014: 5; Grimsrud et al. (2014) indicate that patients eligible for ART are lost early before initiation due to poor recording, incomplete patient contact details for follow up and death due to OIs. Poor linkage of HIV testing and ART initiation site lead to low uptake (Reddy et al. 2016). Children ART initiation in the selected PHC facilities is low even in CHCs which are referral sites for the clinics, suggesting that children are still initiated in hospitals by doctors while PNs are trained on IMCI. This finding is supported by studies conducted by (Smith et al. 2016; Kufa et al. 2014). True reasons for children LFTU and poor initiation also need to be investigated (Abuogi et al. 2016).

Sustaining PLWH on ART is still a challenge and lead to poor prognosis, as treatment became ineffective. The study revealed high rate of LTFU and TROA fluctuating instead of increasing. Monitoring of the treatment outcomes is poor and had negative impact on the HIV service and improving the life of PLWH. The study reveals low VLC and VLS rate after 12 months of starting ART. Ally et al. (2015), reported that monitoring of adverse effects is not done randomly and can lead to unsafe drug use, resistance or virological failure and death. This a global concern and calls for serious attention. Studies conducted in Asia, Cameroon, Ethiopia, Kenya confirm Africa has a serious challenge with regard to adherence and retention of ART patient to care across all age groups (Ojwang et al. 2015; Sidze et al. 2015; Gesesew et al. 2017; De La Mata, 2017). Disclosure and stigma continue to be worrisome challenges to adherence and retention of ART patients to care, especially in rural areas (Plazy et al. 2015; Kimeu et al. 2016).

Practical implications

With reference to the study results and recommendations improvement of NIMART training and implementation could have a positive impact on ART management and monitoring achieving the better programme and quality patient outcomes. The recommendations made might also practically improve integration of theory and practice and dealing decisively with challenges affecting implementation in the PHC facilities.

Limitations of the study

The study only focuses on the statistics of the ART indicators which provided insight on the performance and quality of HIV programme compared to the number nurses trained to render ART services. However, its lack of narrative support of the factors or challenges that lead to such performance suggests that there is urgent need for further investigation to explore such to make sound conclusions and comprehensive recommendations. Data from DHIS and Tier.net might not be reliable as there might a possibility of data not recorded and captured as expected in some facilities.

Conclusion

There is significant impact of NIMART training implementation in terms of expansion of ART initiation by PNs in NMM district PHC facilities, however ART monitoring, adherence and retention to care including compliance to guidelines remain a challenge and has a negative impact on the quality of care. Strengthening NIMART training and exploring barriers influencing implementation should be investigated to achieve the desired HIV programme outcomes.

Recommendations

Based on the study results the following is recommended: NIMART trained PNs should improve linkage of adults, paediatrics and ANC pregnant women tested HIV positive to care through proper tracking and tracing systems to increase new ART initiations. Intensifying routine monitoring of ART initiation uptake & VL collection per cohort to assess the effectiveness of ARVs through the initiation of facility QI

projects. There is a need to strengthen compliance to national ART guidelines through conducting of in-service training, weekly file audits & feedback to improve recording and patient outcomes. Use of training strategies that stimulate critical thinking, improve decision making skills, confidence and competency of PNs trained on NIMART are also strongly recommended.

1. RESEARCH ETHICS

Approval to conduct the study was awarded by NWU ethics committee and permission to access data by the NW province. Anonymity and confidentiality was maintained by using numbers when referring to sub district and facilities. The master list was kept separately and under lock and key from the data. (Grove et al., 2013) and (LoBiondo-Wood & Haber, 2010).

2. Competing interest

The study is funded by NRF and promoted by NWU. The researcher has declared that there is no interest attached to the study. I am grateful to the librarians who assisted in literature search.

3. Author's contribution

SHM for [conception of the study](#), data collection, analysis and writing the manuscript and LM for support, mentoring and coaching throughout the study, [and writing and editing the manuscript](#).

References

Abuogi, L.L., Smith, C., & McFarland, E.J. (2016). Retention of HIV infected children in the first 12 months of ART and predictors of attrition in resource limited settings: A systematic review. *Public library of science*, 11(6): 1-17.

- Ally, S., Meyer, J.C., Schellack, N., & Summers, R.S., (2015). Improving patient safety with antiretroviral treatment by active soliciting adverse drug reaction reports. *South Africa. African journal for physical, health education, recreation and dance* 2(2): 252-267.
- Babbie, E. & Mouton, J. 2011. *The Practice of social research*, edited by Vorster, P. and Prozesky, B. Cape Town: Oxford University Press.
- Baloyi, G.R., Meyer, C.J., Summers, B., & Johnson, S., (2014). Loss to initiation on ART after VCT at two VCT centres near Pretoria, South Africa. *African journal for physical, health education, recreation and dance* 1(1): 1-10
- De La Mata, N.L., Ly, P.S., Nguyen, K.V., Merati, T.P., Pham, T.T., et al. (2017). Loss to follow up trends in HIV positive patients receiving ART in Asia from 2003-2013. *Acquir immune deficit syndr* 74(5): 555-562
- De vos, A.S., Strydom, H., Fouche. C.B., & Delpont, C.S.L. (2012). *Research at Grass roots for the social sciences and human service professions*. 4th ed. Van Schalk publisher: Pretoria.
- Gesesew, H.A., Ward, P., Woldemichael, K., & Mwanri, L., (2017). Prevalence, trend and risk factors for ART discontinuation among HIV –infected adults in Ethiopia in 2003-2015. *Public library of science*, 12(6): 1-16.
- Grimsud, A., Kaplan, R., Bekker, L-D., & London, M., (2014). Outcomes of a nurse – managed service for stable HIV –positive patients in a large South African public sector ART programme. *Tropical medicine and international health* 19(9):1029-1039
- Grove, S.K., Burns, N & Gray, J.R. (2013). *The Practice of Nursing Research: Appraisal, Synthesis, and Generation of Evidence*. (7th Ed). Elsevier Saunders.

Hattingh, Dreyer & Roos. (2012). Community nursing. A South Africa manual. In V. Peu, D., Hlahane, S., Madumo, M., Mataboge, S., Petlhu, R., Prinslo, L & Ricks E (Eds.), (4th end). Oxford university press. Juta: Cape Town

Health system trusts. South Africa health reviews. (2014- 2015). Pretoria: Health system trusts. <http://www.hst.org.za>.

Joint united nations on HIV/AIDS programme. Global report, (2013). Republic of Uganda. Kampala. Uganda: UNAIDS, 2014.

Joint united nations on HIV/AIDS 90-90-90 programme. (2014). an ambitious treatment target to help end the AIDS epidemic. Geneva: UNAIDS, 2014.

Joint united nations on HIV/AIDS programme. The gap report. Geneva: UNAIDS, 2014

Kimeu, M., Barmen, B., Audi, B., Adage, Our, K., Aroid, S., Bio, D., & Zielinski-Gutierrez., (2016). The relationship between adherence to clinic appointment and year-one mortality for newly enrolled HIV infected patients at a regional referral hospital in western Kenya, January 2011-December 2012. *AIDS CARE* 28(40): 409-415

LoBiondo-Wood, G. & Haber, J. (2010). Nursing Research: Methods and critical appraisal for evidence based practice. (7th Ed). Mosby Elsevier: New York.

McNairy, M.L., Joseph, P., Unterbrink, M., Galbaud, S., Mathon, J-E., et al. (2017). Outcomes after ART during the expansion of HIV services in Haiti. *Public library of science*, 12(4): 1-15.

North West province department of health. (2015-2016.) Annual performance plan. Mahikeng.

North West province department of health. District health information system database. Mahikeng. Time series (2012-2015)

- North West province department of health five year strategic plans. (2015- 2016- 2019/2020). Mahikeng.
- National department of health. (2014). National consolidated guidelines for the prevention of mother –to- child transmission of HIV and the management of HIV in children, adolescents and adults. 2015: Pretoria
- Ojwang, V.O., Penner, J., Blat, C., Agot, K., Bukusi, E, A., & Cohen, C.R. (2016). Loss to follow up among youth accessing outpatient HIV care and treatment services in Kisumu, Kenya. *AIDS CARE* 28(4): 500-507
- Ousman. K., Polomano, R.C., Seloilwe, E., Odero, T., Tarmo, E., et al, (2016). Inter professional fellowship training for emerging global health leaders in Africa to improve HIV prevention and care: *The Afya Bora consortium. Journal of the association of nurses in AIDS CARE*, 27(3):331-343
- Plazy, M., Newel, M.L., Orne-Gliemann, J., Naidu, K., Dabis, F., & Dray-Spira, R., (2015). Barriers to ART initiation in rural Kwazulu-Natal, South Africa. *British HIV medicine association* 16 (521-532)
- Reddy, E.A., Agala, C.B., Maro, V.P., Ostermann, J., Pence, B.W., et al. (2016). Test site predicts HIV care linkage and ART initiation: a prospective 3.5 year cohort study of HIV-positive testers in northern Tanzania. *BMC* 16 (497):1-10
- Sidze, L.K., Faye, A., Tetang, S.N., Peng, I., Guemkam, G., et al, (2015). Different factors associated with LTFU of infants born of HIV –infected or uninfected mothers: observation from the ANRSS 12140-PEDIACAM study in Cameroon. *BMC public health* 15(228): 1-10
- Sifanelo, G.M and Theron, F. (2010). An assessment of effectiveness of primary health care service in addressing HIV/AIDS by providing ART treatment: the case of Du noon clinic in the western health sub district of the city of Cape

Town. Stellenbosch: Stellenbosch University. (Dissertation, MA in public administration).

Simelela, N.P and Venter W.D.F. (2014). A brief history of South Africa in response to AIDS. *South African medical journal*, 104 (3): (249-251)

Theuring, S., Sewangi, J., Nchimbi, P., Harms, G., & Mbezi, P., (2014). The challenges of referring HIV positive pregnant women with treatment indication from PMTCT to ART services: a retrospective follow up study in Mbeya, Tanzania. *AIDS CARE* 26(7):850-856

World Health Organization. HIV/AIDS programme strengthening health services to fight HIV/AIDS. Geneva: WHO, 2007.<http://www.who.int/hiv/toroto> 2056/talking stock tr. Date access:

World Health Organization. World health statistics. Geneva: WHO, 2015.

Appendix C

Author Guidelines for Manuscript Three: Health SA Gesondheid Journal

Health SA Gesondheid Author Guidelines



Introduction

Open Access

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**Manuscript Three: Challenges regarding NIMART implementation in
Ngaka Modiri Molema district, North West province**

Challenges regarding NIMART implementation in Ngaka Modiri Molema district, North West province

Sheillah Hlamalani Mboweni, MA Cur and Lufuno Makhado, PhD

¹School of Nursing science, North –West University, Mafikeng campus, Mmabatho, South Africa

Address for correspondence author:

Dr Lufuno Makhado

North-West University, Mafikeng campus,

Private bag X 2046,

Mmabatho,

2735, South Africa.

Telephone: (+27) 18 389 2236

Cell: 0845526260/ 082 826 3153

²Email: Lufuno.makhado@nwu.ac.za

¹Email: mboweni.sheillah@gmail.com

Challenges regarding NIMART implementation in Ngaka Modiri Molema district, North West province

ABSTRACT

Background: The increasing number of people tested HIV positive and who demand ARVs prompted NDoH to adopt WHO recommendations of task shifting where PNs initiate ART rather than doctors in hospital. This resulted in decentralization of services to PHC, generating a need to capacitate PNs on NIMART. After years of training, the impact of NIMART was assessed where it was established that even though there was an increased number who accessed ART, the quality of care is of serious concern. ART initiation, retention to care and VL suppression is low. Therefore, this study explored barriers influencing NIMART training implementation and makes recommendations that can decisively deal with such and improve patient and HIV programme outcomes.

Objectives: The objective of the study was to explore and describe the challenges NIMART training implementation in NMM district PHC facilities and make recommendations for effective training and efficient implementation of the programme.

Methods: A qualitative explorative programme evaluation research design was used. The study was conducted in the rural districts of the North West province. A purposive sampling method was used to identify PNs trained on NIMART from the selected facilities and programme managers directly involved with HIV/TB programme management. FGDs was used to collect data with 6-9 participants and data was analysed using descriptive qualitative analysis.

Results: Five FGDs n=28 PNs and 3 programme managers were interviewed. The study results revealed two themes: inadequacy in NIMART training, which includes partner-driven training and mentoring strategy, the use of different curriculum,

ineffective training strategies, unskilled facilitators, lack of pre-service training in institutions of higher learning, lack of continuous in-service training and lack of mentoring strategy. Theme two is the health care system challenges which include patients' socio-economic status, adherence to treatment appointment and disclosure. Human resource challenges pointed to shortage of staff, over-worked negative staff attitude, lack of confidence to initiate certain patients, poor compliance to policies and guidelines, poor infrastructure, poor district and programme manager's support and lack of discipline. However, few participants reported an increase in knowledge and access to ART.

Conclusion and Recommendations:

There are serious challenges that have a negative impact on learning and practice and results in poor patient and HIV programme outcomes. The following recommendations are made to improve NIMART training and HIV management: standardization of NIMART training curriculum through the involvement all relevant stakeholders, the use of effective strategies that stimulate critical thinking, skilled facilitators, introduction of pre-service NIMART training in institutions of higher learning, development of district mentoring strategy, support of PNs by district and programme managers, plan on how to deal with shortage of staff, negative attitude to ensure compliance to guidelines and data management including maintenance of infrastructure. It is highly recommended to develop a conceptual framework that provides guidance and strengthens NIMART implementation in the PHC facilities.

Key words: NIMART- Nurse initiated management of anti-retroviral therapy training, HIV programme, challenges, PHC facilities, Professional nurses

CHALLENGES REGARDING NIMART IMPLEMENTATION IN NMM DISTRICT, NORTH WEST PROVINCE

1. Introduction and Background

The increasing number of people living with HIV (PLWH) and who demand antiretroviral therapy (ART) exerts intense pressure on the health care system that is already experiencing a high shortage of resources. There is also a scarcity in skilled health care workers who should provide quality HIV services in the PHC facilities (Ousman et al, 2016; Sifanelo & Theron 2012; WHO, 2007). According to Simelela and Venter (2014), South Africa adopted WHO recommendations of task-shifting to address the challenge and this calls for intense training of professional nurses (PNs) on nurse-initiated management of ART (NIMART) in each PHC facility to improve access to treatment. According to WHO, (2012), the prevalence of HIV remains high at 19.1% among the general population globally although there is slight decline by 0.8% since 2000. The figure fell from 38.1 million to 36.9 million in 2014. Only 37% of adults and 24% of children living with HIV received ART world wide. Consequently, the prevalence of HIV and TB co-infected cases is also increasing, adding the burden in the management of both cases. In 2012 there were 9.6 million new TB cases of which 1.2 million were among PLWH globally. In Sub Saharan Africa, PLWH who know their status are at 45%; those receiving ART stand at 39%, while those with suppressed viral load are estimated at 29%. This raises a lot concerns with regard to HIV management (UNAIDS, 2014). In South Africa HIV prevalence amongst the general population is estimated at 6 595 232 with only 47.1% of that number initiated on ART. There has been a decline among children due to PMTCT programme that has reduced mortality by 20%. The life expectancy at birth is still below the target of 70%; with females at 64.3% and males at 60.6 %. Death related to HIV is still the biggest cause at 4.8%. The incidence of Pulmonary TB (PTB) in PLWH infection is also increasing both nationally and specifically in the NW province (Day and Gray 2015: 211). Regional training centres (RTC) were established

to capacitate at least 75% of PNs in each facility with the necessary knowledge skills, confidence and competency to initiate ART and improve the patient and HIV programme outcomes (North West Department of Health, 2015), but gaps still exist in terms of quality. These gaps are evident in PNs who do not implement what they have been trained or do not comply to changes of NDoH policies and guidelines. Often, they do not record nor report accurately. In other instances, they are not mentored efficiently or effectively to become competent to initiate and manage ART. Another gap is poor management of data on ART. These need to be investigated in order to make recommendations that strengthen NIMART training and implementation.

The NMM district has not achieved the expected outcomes of the HIV programme as mandated by the WHO 90-90-90 strategy despite 75% of PNs in PHC facilities having been capacitated on NIMART by the RTC. This was observed during the initial monitoring and evaluation of the impact of NIMART training on the HIV programme, where there is fluctuation on new ART initiation especially paediatrics, TB/HIV co-infected and ANC pregnant women. The high loss to follow up (LTFU) compounded with fluctuating initiation rates leads to a lesser number of patients remaining on ART (TROA). LTFU is estimated at 14% which suggests challenges on adherence and retention to care. There is poor collection of blood to monitor the viral load (VL) which is currently estimated at 54% instead of the benchmark 90%. VL is used to monitor the effectiveness of ARVs in lowering viral load suppression (VLS). From the sample, it has been established that 56% show an unsuppressed VL, a figure far below the target of 90% of patients on ART (North West department of health, 2015 & North West department of health, 2016). Hence the researcher was interested to conduct a detailed study to answer the following question: What are the challenges regarding the implementation of NIMART training on HIV management?

The purpose of the study is to explore and describe the challenges influencing NIMART training implementation on HIV management in order to identify gaps and make recommendations that improve the quality of care to PLWH in NMM district, North West Province. The study findings and recommendations contribute significantly to the RTC and NDoH to improve on NIMART training strategies and align it with challenges encountered in the PHC facilities. The study also provides PHC management and policy makers with strategies that address barriers hindering implementation to achieve improved outcomes and performance of patients on the HIV programme.

2. Material and Methods

2.1. Methods

An exploratory programme evaluation research design was used in the study to explore and describe challenges and strengths of NIMART training and implementation among PNs and programme managers

2.2. Context of the study

The study was conducted in the rural district of the NWPDoh. The province had decentralized HIV management to the PHC level to comply with the implementation of district health care system policy. The district, regional and tertiary hospitals are used as referral point for complicated cases in need of specialized care. The study was conducted in NMM district PHC facilities, including the 5 CHCs and 5 clinics randomly selected and used during Phase 1 of the study. The district is a divided into 5 sub districts with a total of 94 fixed facilities.

2.3. Population and sampling

The population of the study includes all NMM district PNs and programme managers.

Inclusion criteria: PNs trained on NIMART from PHC fixed facilities and Managers directly involved in the implementation and management of the HIV /TB programme, as they are implementation the HIV management programme after training

Exclusion criteria: PNs not trained on NIMART and Managers not directly involved in HIV/TB management. A non-probability purposive sampling method was used in the study. Participants were recruited from all facilities meeting the inclusion criteria, in order to collect data (Babbie & Mouton, 2011).

2.4. Data collection Methods

A Focus Group Discussion (FGD) was used to collect data from PNs trained on NIMART and individual interview were held with programme managers. The Unstructured interview was used and the main question asked was: What are challenges influencing NIMART training and implementation in NMM district PHC facilities? Followed by probing. The probing questions were informed by the findings of qualitative study, which included amongst others the following: quality of training, mentoring, guidelines updates, linkage and retention of PLWH into care. Five FGDs were conducted with n=28 participants and data saturation was reached with this sample size. FGDs were conducted in a private room during participants own time, after work or lunch time to avoid interruption of services and was tape recorded. Permission was obtained from participants and each FGD lasted 90-120 minutes, consisting of 6-9 participants (De Vos et al. 2012). The demographic data of the participants was also collected using a questionnaire and were told that they must not write their names. Participants' codes were used during the FGD and an FGD guide was used to facilitate discussions and to have a better understanding of their experience, position and whether they were assessed for competency or received mentoring to make sound conclusion.

2.5. Data analysis

A descriptive qualitative data analysis was used in the study. In qualitative study data analysis occurs simultaneously with data collection (Grove et al. 2013). Demographic data was captured in Microsoft Excel and descriptive statistics were used to summarize it. Tape recorded data was transcribed verbatim. The ATLAS ti was used to analyse qualitative data supplemented by the basic steps of Notice-Collect Think (NCT) (Friese, 2012). The NCT is conducted in two phases or level that is the descriptive and conceptual analysis. During the descriptive phase the researcher read and re-read the transcripts and field notes then identified patterns of the data and started coding & verifying codes. In the conceptualization phase the ATLAS ti was used to link and classify similar data together into categories and themes (Friese, 2012). Two themes emerged as represented in Table 1 and literature was reviewed based on these themes.

3. Trustworthiness of the study

Trustworthiness refers to ensuring credibility, dependability, conformability and transferability (Polit & Beck, 2008). Trustworthiness was enhanced with strategies describe in table 1.

Table 1: Measures to enhance trustworthiness in the study

Trustworthiness element	Strategies to enhanced trustworthiness
Credibility	Spending enough time with participants during FGDs Until data saturation. The researcher spent 90-120 minutes with each FGD. Recorded interviews, transcribed data and interpretations were shared with participants in order to validate if their experiences were competently and accurately captured participants
Dependability	An audit trail was maintained by keeping all copies of notes, transcribed and recorded data for future use Participants were supplied with the researcher's personal and academic information.
Conformability	Conducting a pilot study which served as pre-test to the interview schedule and interviewing skills from six PNs trained on NIMART from another district in the NW

	<p>province.</p> <p>Conduction pilot study and another district with NINART trained nurses to help in refining the study methods</p> <p>An independent co-coder was used and three consecutive discussions followed before consensus was reached.</p>
Transferability	Use of non-probability purpose sampling methods to collect data from PNs trained on NIMART and managing the HIV.

4. Results

4.1. Demographic data of participants

Five FGDs were conducted with n=28 PNs trained on NIMART from NMM PHC facilities who participated in the study. Table 1 represents the summary of the participants' demographic data and reveals that more PNs (71%) providing direct nursing care participated in the study and 3 (18%) were programme managers. More female PNs (93%) participated than males (7%) and the majority were of 41-50 years old; 43% had work experience of 6 -10 years; 36% of the participants only have a basic diploma in nursing. Participants were mostly from the rural areas (79%), working in PHC clinics 68%, although all were trained on NIMART, only 71% were certificated for competence and 82% reported to be initiating ART while 18% are no longer providing direct patient care but managing the programme. Amongst the PNs who participated, 32% are trained as mentors.

4.2. Challenges influencing NIMART training implementation

Table 2 represents a summary of the challenges experienced by PNs and programme managers in the implementation of NIMART training, challenges that bear a negative impact on the patient and HIV programme outcomes.

Table 2: Thematic analysis of the NIMART/HIV training strategies

No	Theme	Categories	Sub categories
1:	NIMART training Challenges	Poor integration of theory & practice Inadequate facilitation skills Lack of training Model or conceptual framework Lack of NIMART standardized curriculum Lack of pre-service training Inadequate in-service training	
2	Health care system challenges	Patient related challenges Human resource challenges Poor data management Poor infrastructure Lack of support from management	Socio economic status and adherence Lack of disclosure Shortage of skilled health care workers Staff attitude on HIV management Lack of confidence Poor adherence to data management SOPs Incomplete clinical records Inconsistent clinical records quality audits Lack of data verification Poorly maintained PHC facilities Overcrowding

Source: Author's own work

Theme 1: NIMART Training challenges

NIMART challenges were subdivided into 'Poor integration of theory & practice', 'Inadequate facilitation skills', 'Lack of training Model or conceptual framework', 'Lack of NIMART standardized curriculum', 'Lack of pre-service training' and 'Inadequate in-service training'

Category 1: Poor integration of theory and practice

Participants reported that facilitators put more emphasis on theory than practical skills during NIMART training in such a way that they find it difficult to grasp skills, confidence and competence to implement strategies learnt after training without a mentor.

"They talk about of clinical stationery and registers but never show us how to complete."
(P16, FGD4, Male).

"I expected them to at least take us for practice, may be 2 days, 1 for adults and 1 for children to initiate treatment like in IMCI" (P10, FGD3, Female).

Participants expressed that they were overwhelmed by the information presented to them with the facilitator rushing to complete but not focusing on whether they comprehend and can apply what they have learn. Transfer of theory into practice was poor.

"Yoooh, the slides were too much, I was so tired. " (P21, FGD5, Female).

"The trainer was just reading [and] rushing to complete, 5 days was not enough, too much information." (P6, FGD2, Female)

Category 2: Inadequate facilitation skills

Participants who also trained PNs on NIMART reported that they never received formal general facilitation skills to know how to use various teaching strategies, methods and media to meet the diverse needs of the participants. Participants verbalized that they were selected only based on experience of managing HIV

"I just facilitated the content as per orientation, I never go for facilitation skills training."
(P7, FGD2, Female)

"I just have passion for HIV management but do not have facilitation skills" (P10; FGD2, Female)

Category 3: Lack of training Model and conceptual framework

Participants also revealed that there is no conceptual framework or model guiding NIMART training. Each province or district has its own curriculum and ways of conducting training and need serious attention.

"I was not told of any framework or Model to follow, I know nothing about that." (P22, FGD5, Male)

"The RTC and provincial office did not tell us of any framework" (P24; FGD5; Female).

Category 2: Lack of standardized curriculum

Participants highlighted that NIMART training is also partner driven. It is provided by different partners and the period and content differs; some attended sessions for 3 months, while some attended over 5 or 10 days theory classes. There is no standard curriculum from the department of health and participants were not sure if recognize by the SANC.

I was trained for 5 days, with too much content. (P7, FGD 1, Female)

I was trained for 10 days, but there was no practice only theory. (P20, FGD 5. Female)

Participants emphasize that the final assessment for competency process differed from each group of those who participated in the training. This raises question of competence in HIV management.

"I completed a test before and after training. "(P, 18 FGD4, Female).

"I only completed POE" (P19, FGD4, Male).

Category 4: Lack of NIMART pre-service training from institution of higher learning

Participants expressed frustration in not knowing what to do to HIV positive clients who should be initiated on ART. When they started working after completion of

training from the college or university they continued to turn the patients away and advised them to come back another day, all actions which combined to delay ART initiation from their facility when their colleagues who are NIMART trained are not on duty.

" I was so disappointed and frustrated at the same time for failing to help the client." (Emotional, raising the voice) (P8, FGD2, Male).

"Wish NIMART can be introduced in the college or university curriculum so that I know how to manage TB /HIV patients before I join the department." (P13, FGD3, Female).

Category 5: Inadequate in-service training or continuous capacity development

Participants indicated that there is inadequate in-service training on the changes or reviewed guidelines, policies and protocols and results in poor compliance, inefficiency in the implementation of NIMART, at times they just receive guidelines in the facilities without any explanation and resulted in misinterpretation

"Eeeish! I learn about the new guidelines when I have done something wrong in patient management and feel bad." (Feeling sad and emotional) (P3, FGD1, Female).

"I learn about new changes in guidelines from partners supporting my facility." (P2, FGD2, Female).

Participants reported that there is a lack of feedback from those who attend in-service training in the facility. The process of in-service training to update guidelines NIMART nurses in PHC facilities failed to cover all who are implementing and might result in mismanagement of patient, conflict and litigation in some instances.

"Some do attend but [get] no feedback. " (P20, FGD5, Female).

"Even my supervisor in the facility knows nothing about the new guideline" (P23; FGD 5; Male)

Category 6: Lack of mentorship strategy in the district

Programme managers and PNs revealed that NIMART mentorship is partner driven even though some department PNs were trained on clinical mentorship, but they are not implementing the strategies they have acquired.

" I'm a mentor but I can't, I have other responsibilities in the facility, there is shortage of staff." (P16, FGD3, Female).

"There is no mentoring plan in our district, I'm a programme manager with 14 programmes, I'm overworked I need someone to assist in supporting and mentoring facilities" (P20, FGD5, Female)

Participants highlighted to have received different mentoring strategies from different partners as evident in the claims that follow.

" My mentor visits the facility once a week and I sometimes call. "(P2, FGD1, Female).

"I'm supported by my colleagues through what's app or Facebook group." (P16, FGD3, Female)

Theme 2: Health care system challenges

Category 1: Patient related challenges

Sub category 1.1: Socio-economic factors

Participants reported that the client plays a major role in the success of the ART programme and due to socio-economic factors, honouring of appointments and adherence to treatment is a serious concern. This is observed due to high LTFU and TROA fluctuating.

"Patients are always moving from one place to other, looking for jobs. " (P7, FGD2, Male).

"Patient move to farms and mining areas for work without informing the facility they don't honour their appointments." (P8, FGD2, Female)

Sub category 1.2: Lack of disclosure

Adolescents and children adherence to treatment and disclosure is also a serious challenge. This might lead LTFU and drug resistance. Participant were recorded stating that:

" Children and adolescents are brought late to care or default treatment because their status is unknown to care givers." (P2, FGD1, Female).

"During counselling I discovered that the mother did not disclose why the child is taking medication daily" P4; FGD 2, Female

Category 2: Poor infrastructure

Sub category 2.1: Poorly maintained PHC facilities

Participants reported that they are working in an unpleasant environment with cracks, non-functioning toilets, broken pipes, windows, doors, no water and their consultations with patients are not enough, especially counselling for HIV clients and they claimed that nothing is being done by management.

"We only have one consultation room and one counselling room. " (P16, FGD4, Female).

"The walls are having cracks, old paint. Windows and doors broken, toilets for patients not functioning and there is no water." (P15, FGD3, Female)

Sub category 2.2: Overcrowding

Participants emphasize that the facilities are very small and cannot accommodate the high number of patients coming for HIV and other PHC services. This may result in cross infection.

"The waiting area is very small, patients had to stay outside and sometimes it is very cold" (P18, FGD4, Female).

“The facility is always full and congested with patients daily “ (P19, FGD4; female).

Category 3: Human resource challenges

Sub category 3.1: Shortage of skilled staff

Participants reported that there is high staff turnover of skilled human resources in HIV/TB management and the remaining staff are under immense pressure to deal with the large numbers of PLWH demanding ART. Patients also complain of long waiting period for care

“I’m the only PNs in the facility, I’m overworked, so exhausted since ART initiation takes time and I have other responsibilities.” (Very sad) (P5, FGD1, Female).

“Some patients leave without treatment.” (P4, FGD1, Female).

Sub category 3.2: Staff attitude

Participants indicated that some PNs do not want to offer ART services despite having trained on NIMART and often call PNs appointed by partners for initiation and all such actions delay linkage to care.

“Some are being emotional it’s immoral, the client was told to come back and baseline were not taken.” (P4, FGD1, Female).

“Some lack interest, I wonder why do they attend training.” (P6, FGD2, Female).

Sub category 3.3: Lack of confidence to manage children and other complicated cases

Participants revealed that they still lack confidence on managing paediatric cases and this raises serious concern as they are also IMCI trained and provided a step by step guide on how manage sick infant and children, although some indicated that children are often presented late in the PHC facility.

"I am scared to manage infants." (P20, FGD5, Female)

"They presented being very ill with complications and I have to transfer to hospital because When tested positive the caregivers or mothers never come back for treatment." (P1, FGD1, Female)

Participants also revealed that even during completion of POEs after training they do not get enough cases of children, pregnant women and adults with HIV/TB co-infection and used scenarios to learn its management. This might be the reason for lack of confidence and competency.

"I got few cases for my POEs the rest I simulated using scenarios." (P17, FGD4, Female)

"Paediatric cases are very rare in my facility and I forgot management." (P8, FGD3, Male)

Category 4: Poor data management

Participants expressed that they are working so hard to achieve the set target but there are so many data related factors that hamper performance of the HIV programme and these variations in challenges discourage NIMART trained nurses.

Sub category 4.1 Poor compliance to data management SOPs

Participants reported that data is not managed well in the facilities, sub district and district level and reflect badly on their performance.

" Some data is not captured especially TB/HIV and ANC ART initiation" Eeeish data mang yare bulaya"-(its killing us). In my facility there is a pile of files that are not captured." (P4, FGD1, Male)

"OPM and information officers are not verifying data." (P11, FGD3, Female)

Sub category 4.2. Incomplete clinical records

Participants reported that the increasing number of clients in need of ART and other HIV services add to the pressure on PNs in such a way that they do not have time to complete registers, clinical stationery and register appropriately.

"There is too much of writing, patients complain and put pressure on me, alone in the clinic and I forgot to complete the records later." (P4, FGD1, Male)

"Data capturers always complain that clinical stationery is not complete." (P20, FGD5, Female)

Sub category 4.3. Inadequate clinical records audits

Participants reported that OPMs or supervisors were expected to perform their management role of auditing clinical stationery, registers and patient files to ensure compliance to policies and guidelines, but this is not consistently done due to competing activities, overcrowding and shortage of staff.

"As a programme manager, I'm expected to audit records and provide feedback, but I have so many activities that interferes with my programme." (P21, FGD5, Female)

" I need extra hands to support me to perform clinical audits and mentoring. "(P22, FGD5, Female)

Sub category 4.4 Lack of data verification

Participants reported that data is not verified, OPMs or supervisors rely on data capturers who also make mistakes or misplace some files that are not captured and it is only a clinical person who can identify the gaps.

"I am an OPM, I do not perform my duties as most of the time I have to provide direct care due to shortage of staff or other sub district or district activities. "(P21, FGD5, Female)

"OPM and information officers do not conduct data verification and validation" (P19; FGD4; Female)

Category 4: Inadequate support from management

Participants reported that they receive no support from the programme, cluster and district managers with regard to challenges related to ART and TB management after training.

"I relied on mentors from partners, colleagues and sometimes from the facility manager, although busy with other activities." (P16, FGD3, Female)

"I never seen the programme manager coming to mentor or support me after training." (P5, FGD1, Female)

"Managers only come when there is a problem or visit by province or national" (P10, FGD3, Male)

Category 5: Poor compliance to policies and guidelines

Participants reported that most PNs in the facility are trained on NIMART, but some still do not practice what they have been taught despite mentoring and such non-compliance matters compromise the quality of care.

"I do not know, some do not follow guidelines even when they are available in the facility." (P3, FGD1, Female)

"Some PNs has negative attitude they don't provide counselling just issue treatment." (P7, FGD2, Female)

5. Discussion

The study findings reveal that inadequate training strategies and health care systems challenges cumulatively have a negative influence in the implementation of the NIMART training. The RTC is responsible for training and the study revealed the use of ineffective training strategies, partner driven training with no standardized curriculum and unskilled facilitators and this has a negative impact on the outcomes of learning and practice in terms of developing critical thinking skills amongst PNs

in order to make sound and ethical decisions in caring and implementing guidelines. Kaposhi et al., (2014) and Byakika-kibwika et al., (2015), confirms that lack of innovative training and mentoring influence implementation. Lack of pre-service NIMART or HIV training of student nurses had negative impact on implementation and rendering of quality due to knowledge and skills gaps and might lead to negative attitudes towards the HIV programme. This was confirmed by Lekhuleni et al., (2015) that nursing students have insufficient knowledge on ART management. Policies and guidelines change frequently and lack of in-service training on the updates and changes lead to improper implementation and poor patient care. Several studies confirm that continuous facility-based training is necessary to keep clinicians updated (Oladele et al., (2017); Owens & Moroney, (2015). Lack of an appropriate mentoring strategy and relying only on partners affect transfer of knowledge into practice, confidence and competency. Studies conducted by Smith et al., (2016) and Kufa et al., (2014), confirm that nurses still lack confidence and competency after training. Dependency on partners might result in serious collapse in the performance of the HIV programme when they leave the district or facilities. Critical issues of shortage staff contributed to negative attitudes demonstrated by staff as they may have stress due to exhaustion, pressure from patients in the overcrowded facilities as they experience long waiting hours and poor infrastructure and overcrowding should be dealt with decisively as it might expose patients and staff to infection (Mark et al., (2015); Davies et al., (2013); Kaposhi et al., (2014); Mbonye et al., (2016); Spies et al., (2016) and Zuber et al., 2014). This might also contribute to patients' poor adherence to appointments for ART initiation, counselling and disclosure to partners as there is no enough time for quality individual counselling by PNs and this was supported by (Plazy et al., (2015), even though this can differ amongst men and women. All these factors contribute to high LTFU, fluctuating TROA and poor monitoring of ARVs effectiveness through collection of VL and can eventually lead to complications and death thus reduce life expectancy. A study conducted in Kenya and Canada on relationship of adherence

to clinic appointment confirms this (Kimeu et al., (2016) and Patterson et al., (2015). Several studies reviewed revealed similar challenges, however with this study shortage of treatment and equipment was not a raised. Lack of management support to the HIV programme affect its performance and this was supported by Ndubuluka et al., (2016), that clinical role model is necessary to improve implementation.

6. Practical implications

With reference to the study results and recommendations, improvement of NIMART training and implementation could have a positive impact on ART management and monitoring to achieve better programme outcomes and improve the quality of life of PLWH. The recommendations made might also practically improve integration of theory and practice and dealing decisively with challenges affecting implementation in the PHC facilities. Further research study needs to be conducted to develop a conceptual framework and model to guide and strengthen NIMART training and implementation.

7. Limitations of the study

The study only focused on the challenges impacting the NIMART training implementation with specific reference to HIV programme, however strategies used to deal with barriers for the HIV programme can also be transferred to improve other programmes in order to render a comprehensive integrated quality care.

8. Conclusion

Significant challenges influencing the quality of NIMART training implementation were revealed and this includes training strategies, health care system and patient factors and these need to be dealt with to achieve better patient and HIV programme outcomes. However, few participants revealed any positive impact that the NIMART training has borne, which include improving knowledge on HIV management,

increasing access to care in terms of expansion of ART programme by PNs in NMM district PHC facilities.

9. Recommendations

Based on the study results the following is recommended: The RTC, NDoH, nursing departments from institution of higher learning, SANC, developmental partners and other relevant stakeholders should adopt a standardized NIMART training curriculum, employ skilled facilitators and ensure that interactive critical thinking training strategies are used during training to improve implementation, including mandating institutions of higher learning to integrate NIMART in their curriculum to prepare students nurses to render quality HIV care when entering the health care system. Programme managers should provide support to PNs trained on NIMART by dealing with barriers that hinder implementation and through development and implementing district mentoring strategy and coaching. The data management team and OPMs should monitor compliance to data management SOPs and conduct weekly data verification, validation and auditing of clinical stationery and registers to improve data quality. The district management team including OPMs should develop a plan to deal with shortage of resources, human and infrastructure. The district management team and OPM also should implement consequence manage PNs trained on NIMART but not complying with policies and guidelines. Further studies are necessary to develop a conceptual framework or model that provides guidance and strengthen NIMART training and implementation.

10. Research ethics

Approval to conduct the study was awarded by NWU ethics committee and permission to collect data by the NW province. Participation was voluntary and they were informed of the right to withdraw at any stage of the study. Anonymity and confidentiality of participants was maintained by not using their names in the

demographic questionnaire and during the FGDs. Participants were informed that the tape recorder would be used and sign consent form. The master list was kept separately and under lock and key from the questionnaire, consent forms and tape recorder. (Grove et al., 2013: 125) and (LoBiondo-Wood & Haber, 2010: 251).

11. Competing interest

The researcher has declared that there is no interest attached to the study. The study is funded by NRF and promoted by NWU. Special thanks to the Librarian who assisted in literature search.

13. Author's contribution

SHM contributed in data collection, analysis, initial writing of the manuscript. LM supervised the whole process of the research and writing of this manuscript, LM and SHM edited and participated in the final writing of the manuscript.

References

- Babbie, E. and Mouton, J. (2011). *The Practice of social research*, edited by Vorster, P. and Prozesky, B. Cape Town: Oxford University Press
- Byakika-Kibwika, P., Kutesa, A., Baingana, A., Muhumuza, C., Kitutu, F.E., et al. (2015). A situation analysis of inter-professional education and practice for ethics and professionalism training at Makerere University College of health sciences. *BMC research notes*, (2015) 8:598
- Davies, N., Homfray, M., & Venables, E.C., (2013). Nurse and manager perception of nurse initiated and managed antiretroviral therapy (NIMART) implementation in South Africa: a qualitative study. *BMJ open*, 2013(3): 1-9.
- De Vos, A.S., Strydom, H., Fouche. C.B., and Delport, C.S.L. (2012). *Research at Grass roots for the social sciences and human service professions*. 4th ed. Van Schawck publisher: Pretoria.

- Grove, S.K., Burns, N and Gray, J.R. (2013). *The Practice of Nursing Research: Appraisal, Synthesis, and Generation of Evidence*. 7th ed. Elsevier Saunders.
- Health system trusts. South Africa health reviews. (2014- 2015). Pretoria: Health system trusts. <http://www.hst.org.za>.
- Joint united nations on HIV/AIDS programme. Global report, (2013). Republic of Uganda. Kampala. Uganda: UNAIDS, 2014.
- Joint united nations on HIV/AIDS programme. 90-90-90. Strategy. An ambitious treatment target to help end the AIDS epidemic. Geneva: UNAIDS, (2014).
- Joint united nations on HIV/AIDS programme. The gap report. Geneva: UNAIDS, (2014).
- Kaposhi, B.M., Mqoqi, N., & Schnopflocker, D(2014). Evaluation of antiretroviral treatment programme monitoring in Eastern Cape. South Africa. Health policy and planning, 2014: 1-8
- Kimeu, M., Barmen, B., Audi, B., Adage, Our, K., Aroid, S., Bio, D., & Zielinski-Gutierrez., (2016). The relationship between adherence to clinic appointment and year-one mortality for newly enrolled HIV infected patients at a regional referral hospital in western Kenya, January 2011-December 2012. *AIDS CARE* 28(40): 409-415
- Kufa, T., Hippner, P., Charalambous, S., Kielmann, K., Vassall, A., Churchyard, G.J., Grant, A.D., & Fielding, K.L., (2014). A cluster randomised trials to evaluate the effect of optimising TB/HIV integration on patients' level outcomes: The merge trial protocol. *Contemporary clinical trials. PUBMED* 39(2): 280-287
- Lekhuleni, M.E., Kola, J.C., & Moomba, M.O. (2015). Knowledge of student nurses in NIMART at University of Limpopo, South Africa. *African journal for physical, health education, recreation and dance* 1(1): 53-61

- LoBiondo-Wood, G. and Haber, J. 2010. *Nursing Research: Methods and critical appraisal for evidence based practice*. 7th ed. Mosby Elsevier: New York.
- Mack, N., Wong, C., McKenna, K., Lemons, A., Odhiambo, J., et al, (2015). Human resource challenges to integrating HIV pre-exposure prophylaxis into the public health system in Kenya. *African journal of reproductive health* 19(1): 54-62
- Mathibe, M.G., M.D., Hendricks, S.J.H., Bergh, A., (2015). Clinicians' perception and patient experiences of antiretroviral treatment integration in primary health care clinics, Tshwane, South Africa. *Curationis* 38(1): 1-11
- Mbonye, M.K., Burnett, S.M., Naikoba, S., Ronald, A., Colebunders, R., et al., (2016). Effectiveness of educational outreach in infectious diseases management: a cluster randomized trial in Uganda. *Biomed central public health*, 16 (714).
- McNairy, M.L., Joseph, P., Unterbrink, M., Galbaud, S., Mathon, J-E., at all. (2017). Outcomes after ART during the expansion of HIV services in Haiti. *Public library of science*, 12(4): 1-15.
- National Department of Health. (2011). *Clinical mentorship manual for integrated services*. Pretoria.
- North West province department of health. (2015). *Annual performance plan*. Mafikeng.
- North West province department of health. *District health information system database*. Mafikeng. Time series (2015)
- North West province department of health five year strategic plans. (2016)-2019/2020. Mafikeng.
- National department of health. (2014). *National consolidated guidelines for the prevention of mother –to- child transmission of HIV and the management of HIV in children, adolescents and adults*. 2015: Pretoria

- Ndubuka. N.O., Lim, L.M., van der Walt. D.M., & Ehlers, V.J. (2016). Health related quality of life antiretroviral treatment defaulters in Botswana. *South African journal of HIV medicine* 16(1): 1-6
- Ojwang, VO., Penner, J., Blat, C., Agot, K., Bukusi, E, A., & Cohen, C.R. (2016). Loss to follow up among youth accessing outpatient HIV care and treatment services in Kisumu, Kenya. *AIDS CARE* 28(4): 500-507
- Oladele, E.A., Khamofu, H., Asala, S., Safeh, M., Ralph-Opara, U., et al., et al, (2017). Playing the catch –up game: Accelerating the scale-up of prevention of mother to child transmission of HIV (PMTCT) services to eliminate new paediatric HIV infection in Nigeria. *Public library of science*, 17(1): 1-6
- Ousman. K., Polomano, R.C., Seloilwe, E., Odero, T., Tarmo, E., et al, (2016). Inter professional fellowship training for emerging global health leaders in Africa to improve HIV prevention and care: *The Afya Bora consortium. Journal of the association of nurses in AIDS CARE*, 27(3):331-343
- Owens, A., and Moroney, T. (2015). Shifting the load: improving bioscience performance in undergraduate nurses through student focused learning. *Collegian* 24(2017):37-43
- Patterson, S., Cession, A., Sami, H., Chan, K., Zhang, W., et al., (2015). Life expectancy of HIV –positive individuals on combination antiretroviral in Canada. *BMC infectious Diseases*. 2015(15): 4-10
- Plazy, M., Newel, M.L., Orne-Gliemann, J., Naidu, K., Dabis, F., & Dray-Spira, R., (2015). Barriers to ART initiation in rural Kwazulu-Natal, South Africa. *British HIV medicine association* 16 (521-532)
- Sifanelo, G.M and Theron, F. (2010) an assessment of effectiveness of primary health care service in addressing HIV/AIDS by providing ART treatment: the case of Du noon clinic in the western health sub district of the city of Cape Town.

Stellenbosch: Stellenbosch University. (Dissertation, MA in public administration).

Simelela, N.P and Venter W.D.F. (2014). A brief history of South Africa in response to AIDS. *South African medical journal*, 104 (3): (249-251)

Smith, J., Oldera, D.N., Chege, D., Muigai, E.N., Patnaik, P., et al, (2016). Identifying the gaps: an assessment of nurses training, competency and practice in HIV care and treatment in Kenya. *Journal of the association of nurses in AIDS and CARE*, 27(3): 322-330.

Spies, L.A., Gray, J., Opollo, J., & Mbalinda, S., (2016). HIV and Nurses: A focus group on task shifting in Uganda. *Journal of the association of nurses in AIDS CARE*, 27(3):179-182

Polit, D.F and Beck, C.T. (2011). *Essentials of Nursing Research: Appraisal Evidence for Nursing Practice*. 7th ed. Wolters Kluwer. Lippincott. Williams and Wilkins.

World Health Organization. HIV/AIDS programme strengthening health services to fight HIV/AIDS. Geneva: WHO, (2007).[http://www.who.int/hiv/toroto2056/talking stock tr](http://www.who.int/hiv/toroto2056/talking%20stock%20tr). Date access:

World Health Organization. *World health statistics*. Geneva: W

Zuber, A., McCathy, C.F., Verani, A.R., Msidi, E., & Johnson, C., (2014). A survey of nurse initiated and managed antiretroviral therapy (NIMART) in practice, education, policy and regulation in East, central and Southern Africa. *Journal of the association of nurses in AIDS CARE*, 25(6):520-531.

Manuscript Four: Conceptual Framework for Strengthening Nurse-Initiated Management of ART Training and Implementation in North West Province

1 **TITLE: Conceptual Framework for Strengthening Nurse-Initiated Management of**
2 **ART Training and Implementation in North West Province**

3 **Sheillah Hlamalani Mboweni¹, MA and Lufuno Makhado¹, PhD**

4 *¹School of Nursing science, North-West University, Mafikeng Campus, Mmabatho, South Africa*

5 **¹Address for corresponding author:**

6 Professor Lufuno Makhado, North-West University, Mafikeng Campus, Private Bag
7 X 2046, Mmabatho, 2735 South Africa. Telephone: (+27) 18 389 2236, Cell:
8 0845526260/ 0611472002, Email: Lufuno.makhado@nwu.ac.za

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10 ABSTRACT

11 **Background:** The implementation of NIMART or HIV management training is a
12 challenge in the PHC, after the adoption of task shifting. It is evident from the
13 literature reviewed and the data obtained from the North West Province in South
14 Africa in the HAST report that gaps still exist. There is no conceptual framework that
15 provides guidance and strengthens implementation of NIMART. Therefore, the
16 researcher identified a need to develop such a conceptual framework.

17 **Aim:** This paper sought to conceptualise the study findings to develop and describe
18 a conceptual framework that provides guidance and strengthens NIMART training
19 and implementation in order to improve patient and HIV programme outcomes in
20 the NW province.

21 **Method:** An explanatory sequential mixed method research strategy (QUAN-qual)
22 was followed. A descriptive and explorative programme evaluation design was used
23 and data collected from two sources DHIS, Tier.net of n=10 PHC facilities, to
24 determine the impact of NIMART on the HIV programme and five FGDs n=28
25 conducted from NIMART nurses and programme managers directly involved in the
26 management of HIV and TB programme until data saturation.

27 **Results:** The study revealed that there is low ART initiation compared to the
28 number of clients who tested HIV positive, especially amongst children and ANC
29 pregnant women. There is poor monitoring of patients on ART, evident in the low
30 viral load collection and suppression, fluctuating TROA, high LTFU and deaths
31 related to HIV. Challenges exist and this was confirmed by the qualitative findings,
32 including health care organisation, patient, human resource ratios, training and
33 mentoring and the entire absence of a conceptual framework or model that guides
34 training and implementation.

35 **Conclusion:** The study findings were conceptualised to describe and develop a
36 framework needed to facilitate and influence NIMART training and implementation

37 in order to improve the HIV programme and patient outcomes. Dickoff, James and
38 Wiedenbach's practice-orientated theory and Donabedian's SPO model provided a
39 starting point in the ultimate development of the framework.

40 **KEY WORDS:** NIMART training, HIV programme, NMART nurse, ART, PHC

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Conceptual Framework for Strengthening Nurse-Initiated Management of ART Training and Implementation in North West Province

Sheillah Hlamalani Mboweni¹, MA; Lufuno Makhado¹, PhD

¹ School of Nursing science, North–West University, Mafikeng, Mmabatho, South Africa

1. Introduction and Background

Human Immune Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) remain serious global concerns. The prevalence of HIV is increasing even though it has shown a slight decline of 0.8% from 2000, estimated at 19.1% and meaning that 36,9 million people are living with HIV (PLWH) worldwide (WHO, 2015). The prevalence varies according from country to region. The developing and under-developed countries and sub-Saharan region are in particular highly affected, compounded by increasing burden of TB (UNAIDS, 2015). South Africa has the largest epidemic in the world with an estimated 7 million PLWH at a prevalence rate of 19% amongst adults, of which 13% is amongst men sleeping with men (MSM), 30% pregnant women and 1.4% children. Out of these figures, only 60% know their HIV status. However, 3.4 million PLWH can now access ART (UNAIDS, 2016). Furthermore, there are 290 000 new HIV infections each year in South Africa and TB incidents stand at 854 per 100 000 cases which include PLWH. Such figures raise serious concerns (UNAIDS, 2016). In addition, 1/4 of deaths reported in SA are due to HIV related illnesses and TB has been identified as the leading cause at 8.4% of natural deaths (UNAIDS, 2016). WHO task-shifting was implemented for nurses to

initiate ART in order to meet this increasing demand for anti-retroviral therapy (ART) since 2009 (WHO, 2007). Other policy strategies like 90-90-90 were developed and nurses working in the primary health care setting (PHC) were capacitated in order to improve the management and to control the HIV and TB epidemics (UNAIDS, 2014). Despite these measures, quality health is still a challenge as measured by patient outcomes. This is confirmed by low viral load suppression, high loss to follow up (LTFU) and fluctuating numbers of total patients remaining on ART (TROA). In addition, ART initiation among HIV positive ANC pregnant women, children and TB/HIV co-infected is far below the target of 90% in some districts of the North West province. This is despite the fact that nurses in the province have been trained on HIV management or NIMART (North West Department of Health, 2016). The health care system in the North West continues to experience challenges that have serious repercussions on the implementation of NIMART or HIV management. This fact points to the negative impact on the outcomes of the programmes and patients. Several studies reviewed in this study have revealed that organisational barriers influencing NIMART implementation range from training, human resources, budget to patient factors. All these need to be dealt with decisively (Kaposhi et al., 2014; Byakika-kibwika et al., 2015; Mark et al., 2015; Davies et al., 2013; Mbonye et al., 2016; Spies et al., 2016; Zuber et al., 2014). The objective of NIMART training is to produce knowledgeable, skilled and competent nurses who exhibit confidence as health practitioners. The training also seeks to

inculcate positive attitudes in the practitioners as they deal with PLWH. The ultimate stride is that the HIV programme ought to improve patient outcomes (National Department of Health, 2011). However, NIMART nurses still lack confidence to manage PLWH. An initial comprehensive literature review study was conducted and no framework or model was identified that could guide training and implementation of the NIMART. According to Lekhuleni et al. (2015), student nurses still lack knowledge and confidence to implement, monitor and evaluate the HIV programme. Furthermore, it was identified that both training and mentoring are partner driven. Therefore, with this paper, the researcher aimed to develop and describe a conceptual framework that provides guidance and strengthens NIMART training and implementation in order to improve patient and HIV programme outcomes in the NW province. Effective training and implementation should be guided by a model that characteristically supports the conceptual framework. In this paper, the Dickoff, James & Wiedenbach's (1968) practice oriented theory and Donabedian's structure, process and outcome model formed the bases for the development of the conceptual framework.

The objective of the study was to conduct meta-inferences and an interpretation of the overall study findings in order to develop a conceptual framework.

2. Methods

2.1. Design

An explanatory sequential mixed method research strategy was used to obtain an in-depth understanding of the impact of and barriers influencing NIMART training and implementation to produce more complete and well-validated conclusions (Creswell, 2009 & Munhall, 2012). The study was conducted in four phases up until the development of the conceptual framework. A comprehensive literature review was conducted following the seven comprehensive steps used to conduct this study and general narrative methods as it allows the use of both methods (Onwuegbuzie & Frels, 2016). A programme evaluation design was used for both quantitative and qualitative studies to evaluate and describe the impact of NIMART training on HIV management and to explore and describe challenges and strengths of NIMART training and implementation based on the findings of the initial quantitative results (Groves et al. 2013; Babbie & Mouton, 2011).

2.1. Methods to be followed in the development of the Conceptual framework

The conceptual framework was crafted based on the findings of QUAN-qual initial studies. Dickoff, James & Wiedenbach's (1968) practice oriented theory and Donabedian's structure, process and outcomes model were simultaneously used to classify and categorise the characteristics, activities and functions of the NIMART training and the implementation of the HIV programme in PHC facilities. There is a symbiotic relationship between Dickoff's practice orientated theory and Donabedian's SPO model. The two therefore provided a starting point for the development of the conceptual framework.

2.1.1. Description of the basic unit of the conceptual framework

The typical characteristics, activities and functions were outlined and described through the process of abstraction, starting from the concrete level of experience to the higher level of abstraction in order to determine an ideal framework (Mouton & Marais, 1996).

2.1.2. Selection

The results of the abstraction merely identified the characteristics of the NIMART training and implementation. As a result, this study sifted through the selection by further examining and describing the relationship between the typical characteristics, activities and functions of NIMART training and implementation of the HIV programme (Mouton & Marais, 1996).

2.1.3. Criteria for classification

The exhaustiveness and mutual exclusiveness were used as criteria to select the most appropriate characteristics best describing the phenomenon. Again, further refinement was done to eliminate overlapping activities (Mouton & Marais, 1996).

Table 1: Research Designs and Method for the development of CF

	Design	Population	Sampling	Sample size	context
Literature review	Comprehensive Literature review (CLR)	All full text articles	multimodal	33	
Phase 1	Descriptive programme evaluation	All NMM district PHC facilities	Simple stratified random	10(5 CHCs & 5clinics)	Rural NMM
Phase 2	Exploratory Descriptive	All NMM NIMART trained PNs	Non-probability Purposive	28	Rural NMM
Phase 3	Dickoff et all practice oriented theory & Donabedian's SPO model	PHS/CHS NIMART Trained PNs	Stratified Random & Purposive	10 PHC facilities & 28 NIMART PNs	Rural NMM

2.2. Sample and study setting

Stratified simple sampling was used to select n=5 PHC clinics and n=5 CHCs from the predominantly rural Ngaka Modiri Molema district of the North West province, with five local municipality and 94 PHC facilities, for the quantitative study. On the other hand, a non-probability purposive sampling method was used to select NIMART trained nurses and programme managers directly involved in the management of TB and HIV programme (Groves et al. 2013; Babbie & Mouton, 2011).

2.3. Data collection

Quantitative data was collected from a secondary source, which is the District Health Information System (DHIS) and Tier.net from January 2012 to December

2016. The following variables were measured: Adult started on ART during this month – naïve; Children under 15 years started on ART during this month – naïve; ANC pregnant women initiated on ART and number of PNs trained on NIMART from RTC report (North West province skill audit report, 2015). Additional tracer indicators of monitoring viral load (VL), viral load collection (VLC), viral load suppression (VLS), loss to follow up (LTFU) and death were analysed to obtain a clearer picture of the impact of NIMART training on patients receiving ART in the NMMD. Furthermore, five FGDs with n=28 participants which lasted for 90-120 minutes were used to collect data in qualitative study. Data saturation was reached within this number (De Vos et al. 2012). One unstructured main question was asked to participants followed by probing, guided by the quantitative study findings

2.4. Data analysis

Data from DHIS was extracted as pivot tables into excel, analysed and presented quantitatively in tables and graphs using descriptive statistics. An Atlas ti was used to analyse qualitative data supported by the basic steps of descriptive analysis were followed to analyse qualitative data: coding, analyses and describing (Friese, 2012). Data from a tape recorder and field notes were transcribed verbatim. The researcher read and re-read the transcribed data until patterns emerged. Such themes were then grouped according to the similarity in codes and later classified into categories.

2.5. Trustworthiness

Trustworthiness of the study findings was enhanced by the use of mixed methods, validating data with participants, keeping all tape-recorded data and notes safe for

future reference. The researcher also spent enough time with participants until data saturation, allowing the researcher to scrutinize and amplify the data. An initial pilot study facilitated the development and refinement of study methods (Babbie & Mouton, 2011; Grove et al. 2013).

2.6. Ethical considerations

The study received approval from the North-West University (NWU) ethics and research committee and permission to conduct the study was granted by the NW Department of Health. Voluntary, written informed consent was obtained from participants and they were informed of their rights to withdraw from the study at any time. The data collected was tape-recorded after permission was granted and this was kept safe and locked. Privacy, anonymity and confidentiality in all procedures were maintained in the spirit of ethical conduct (Grove et al., 2013; LoBiondo-Wood & Haber, 2010). The NWU Ethical clearance number for the study is 00607-17-A9

3. Results

Meta inference and interpretation of the quantitative and qualitative results was conducted to supplement the quantitative findings and these are presented as follows:

3.1. NIMART training coverage in the PHC facilities and ART intake constraints

The quantitative findings represented in Table 1 reveals all PHC clinics from rural, urban and semi-urban area (100%) are within the set coverage target of 75%, and

only one CHC from a semi-urban area (58.8%) is below the target. 23% of PNs are still not trained and from those trained only 70% have embarked on initiating ART. The remaining 42.8% of PNs have not been assessed and certificated for competency.

Table 1: NIMART training coverage NMM RTC, 2016

Sub district	Area	Facilities	PNs in the facility	No trained	Not trained	Initiating ART	Certificated	Not certificated
1	U	CHC 1	17	13(76%)	4(23.5%)	13	9	4(30.7%)
	R	Clinic 1	13	10(77%)	3(23%)	10	7	3(30%)
2	R	CHC 2	15	14(93%)	1(6.6%)	14	11	3(21.4%)
	R	Clinic 2	2	2(100%)	0	2	0	2(100%)
3	SU	CHC 3	12	9(75%)	3(25%)	9	3	6(66.6%)
	R	Clinic 3	4	3(75%)	1 (25%)	3	0	3(100%)
4	SU	CHC 4	8	6(75%)	2(25%)	6	5	1(16.6%)
	R	Clinic 4	2	2(100%)	0	2	1	1(50%)
5	SU	CHC 5	17	10(58.8%)	7(41%)	10	4	6(60%)
	R	Clinic 5	1	1(100%)	0	1	0	1(100%)
Total			91	70(76.9%)	21(23%)	70	40(57.1%)	30(42.8%)

Source: skills audit report, RTC 2016; key: R*rural, SU*semi urban, U*urban

The qualitative results revealed that newly qualified PNs from the nursing colleges and university reported that they were frustrated by not knowing what to do and tend to transfer patients who tested positive to another facility or book them for another day. Such transfer of responsibilities could negatively contribute to low ART initiation and losing patients before initiation. The study revealed that not all HIV positive patients are initiated on ART in both PHC clinics and CHCs as represented in Table 2 & 3 and Fig 1 & 2, especially amongst children and ANC pregnant women despite the introduction of option B+ in 2013 (National Department of Health, 2014) and universal test and treat in September 2016 (National Department of health, 2016). This policy specifically directs that all patients who are HIV positive should be initiated on ART without considering the CD4 cell count. This was found to be

closely linked to the qualitative results represented in Table 4, showing clearly that NIMART nurses are not initiating ART because they are not trained. The other reason lies in the fact that some PNs have negative attitudes towards the HIV programme. There is evidence too that inadequate in-service training on updated guidelines, poor compliance to guidelines, lack of confidence especially to manage children and TB/HIV co-infected patients and poor linkage to care within the facility only serve to exacerbate the situation with regards PLWH. In addition, NIMART nurses revealed data quality and management is poor. This contributes to low ART initiation and frustrates them as their hard work is not recognised. The study also disclosed that NIMART nurses fail to complete and audit clinical records and such practices compromise the quality, capturing and reporting of critical data.

Table 2: HIV testing versus ART initiation in NMM district PHC CHC

Sub district	Facilities	HTS all ages	Jan- Dec 12	Jan- Dec 13	Jan- Dec 14	Jan- Dec 15	Jan Dec 16	Total
1	CHC 1	HIV Tested	3 177	3 765	4 122	4 723	4 589	20 376
		HIV +ve	419	392	449	399	359	2018
		Total Initiated	259	250	326	221	258	1 314
		Yield	13	10	11	8	8	51
2	CHC 2	HIV tested	1 111	1 673	1 723	1 803	2 211	8521
		HIV +ve	239	263	299	194	201	1196
		Total Initiated	187	136	191	96	103	713
		yield	22	16	17	11	9	74
3	CHC 3	HIV Tested	749	603	849	895	501	3597
		HIV +ve	219	189	209	192	258	1067
		Total Initiated	109	122	127	135	34	527
		yield	29	31	25	21	51	158
4	CHC 4	HIV Tested	503	488	591	607	678	2867
		HIV +ve	179	191	122	104	111	707
		Total Initiated	99	139	92	124	34	488
		yield	36	39	21	17	16	129
5	CHC 5	HIV Tested	1 122	1 599	1 879	2 088	2 322	9010
		HIV +ve	199	319	352	409	489	1768
		Total Initiated	233	248	205	152	212	1050
		yield	18	20	19	20	21	97

Source: DHIS & Tier.net February 2017, +ve - positive

The study also revealed that patients contribute to the low ART initiation, as facilities lose them before they are initiated. It was revealed that patients still suffer stigma and discrimination and do not disclose their status to their partners and family. Such non-disclosure is bound to affect their children. The poor socio-economic status faced by PLWH is also a barrier that massively adds to non-adherence to appointments as they move from one area to another looking for jobs. In addition, the study results also revealed that the HIV positivity yield is fluctuating in all selected PHC facilities.

Table 3: HIV testing versus ART initiation in NMM district PHC clinics

Sub district	Facilities	HTS all ages	Jan- Dec 12	Jan- Dec 13	Jan- Dec 14	Jan- Dec 15	Jan Dec 16	Total
1	Clinic 1	HIV Tested	289	292	282	345	339	1 547
		HIV +ve	51	35	47	38	47	218
		Total Initiated	35	17	29	27	32	140
		yield in %	18	12	17	11	14	71
2	Clinic 2	HIV Tested	399	273	297	304	312	1 585
		HIV +ve	59	55	53	59	49	275
		Total Initiated	41	19	42	45	40	187
		yield in %	15	20	18	19	16	88
3	Clinic 3	HIV Tested	117	121	133	191	189	751
		HIV +ve	47	43	37	29	34	190
		Total Initiated	32	35	23	8	0	98
		yield in %	40	36	28	15	18	137
4	Clinic 4	HIV Tested	300	297	201	199	320	1 317
		HIV +ve	65	46	71	66	88	336
		Total Initiated	37	44	40	45	47	213
		yield in %	22	15	35	33	28	133
5	Clinic 5	HIV Tested	1 167	1 357	1 978	1 859	1 972	8 333
		HIV +ve	304	340	297	202	301	1 444
		Total Initiated	210	209	146	136	146	847
		yield in %	26	25	15	11	15	92

Source: DHIS & tier.net February 2017, +ve –positive

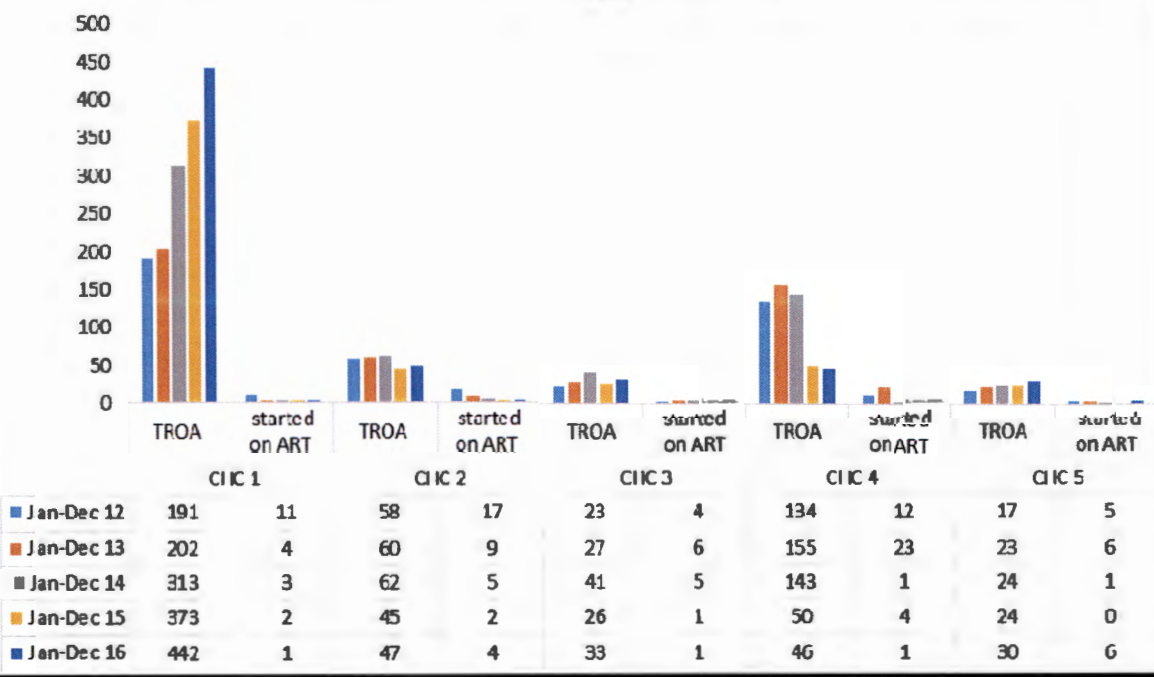
The study findings revealed several challenges influencing NIMART implementation as represented in Table 4. The health care organization can negatively influence the implementation of NIMART training. NIMART nurses revealed that the PHC infrastructure is not well maintained. The facilities are also too small to cater for the increasing number of clients who wish to access PHC, including HIV services. This can expose both staff and patient to cross infection due to overcrowding. Some patients wait outside and feel uncomfortable when they have to wait for long times before they can be attended to. The study revealed that there is a critical shortage of skilled human resources and the Department of Health cites budget constraints as the main limitation. They reported high staff turnover especially amongst skilled NIMART nurses. The remaining NIMART nurses and programme managers reported that they are over-worked and this put severe pressure on them. Because the NIMART nurses are stressed, hence some display negative attitudes to the HIV programme and towards PLWH. These also contribute to poor compliance to guidelines, patients having to wait for long hours for care while some left unattended. Both NIMART nurses and programme managers revealed that there is no support, coaching and supervision from management and all these absences demoralize them.

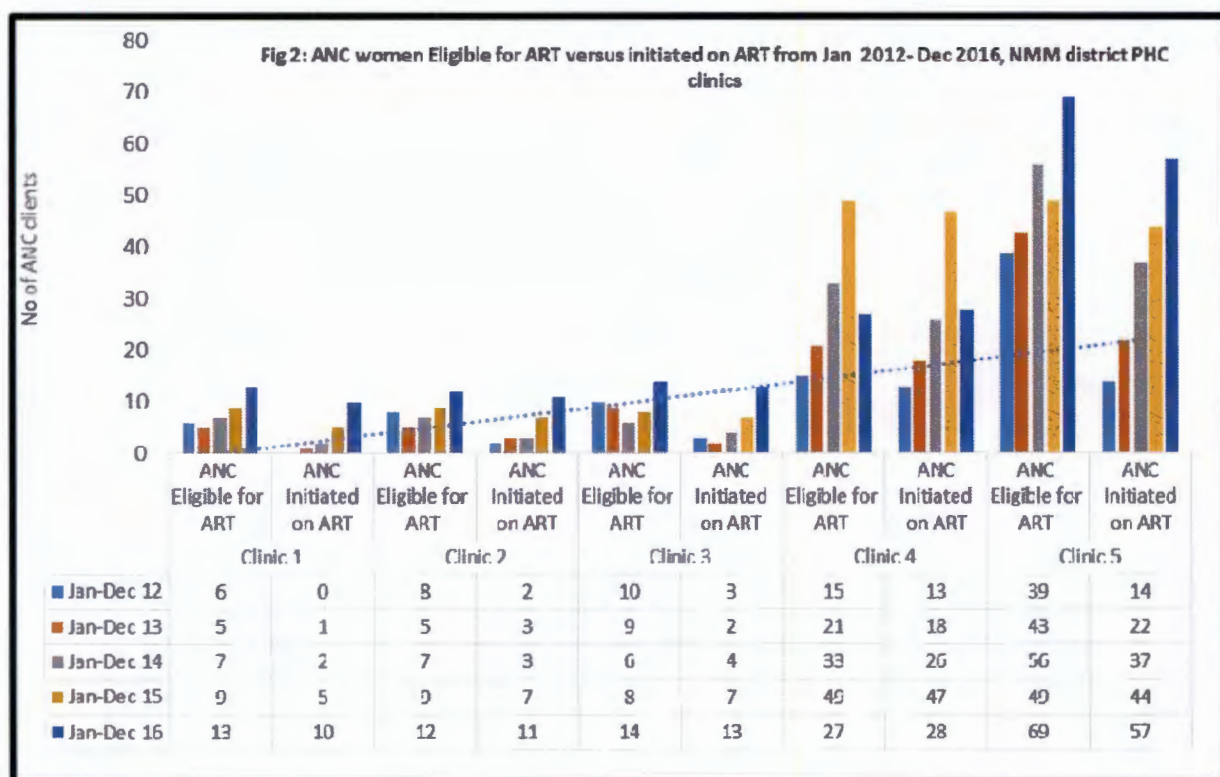
Table 4: representing the challenges influencing NIMART training implementation

Theme	Category	Sub category
1. NIMART training challenges	Poor integration of theory & practice	
	Inadequate facilitation skills	

	Lack of training Model or conceptual framework	
	Lack of NIMART standardised curriculum	
	Lack of pre-service training	
	Inadequate in-service training	
2.Health care system challenges	Patient related challenges	Socio economic status and adherence Lack of disclosure
	Human resource challenges	Shortage of skilled health care workers
		Staff attitude on HIV management Lack of confidence
	Poor data management	Poor adherence to data management SOPs Incomplete clinical records Inconsistent clinical records quality audits Lack of data verification
	Poor infrastructure	Poorly maintained PHC facilities Overcrowding
	Lack of support from management	

Fig 1 : Children under 15 yrs ART initiation vs TROA, in NMM district CHCs, Jan 2012 Dec 2016





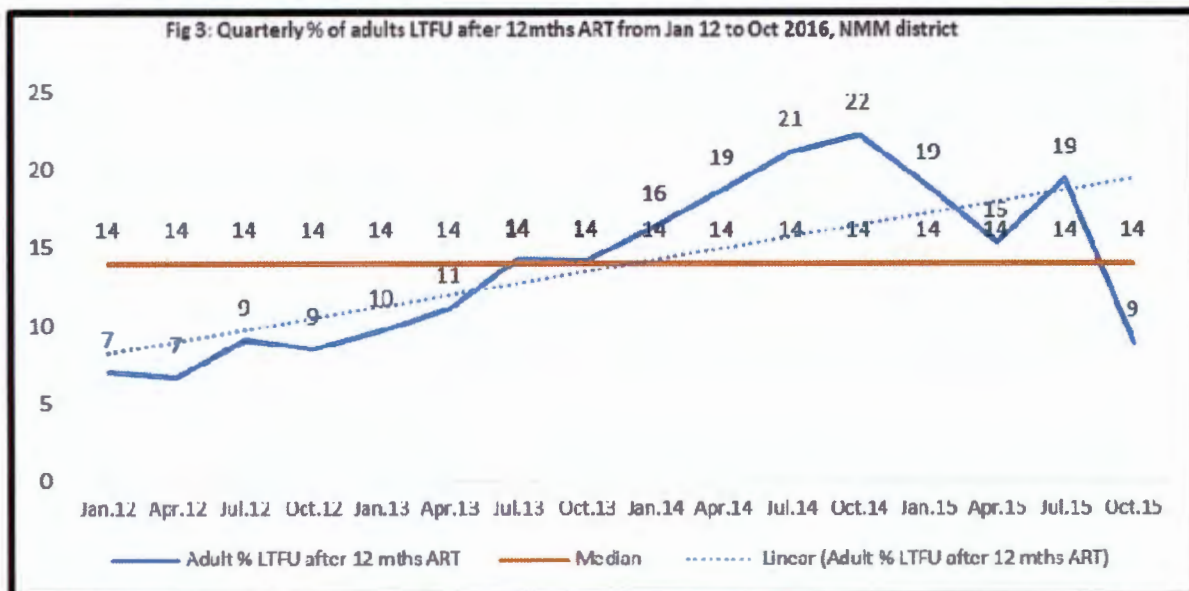
3.2. Gaps in NIMART training

In addition to the health care organisation and patient factors that have been discussed, the study revealed flaws in NIMART training and mentoring. These flaws influence implementation as indicated in Table 4. Training and mentoring is partner driven even though there is no standard curriculum and mentoring strategy. Training is conducted differently over 5 or 10 days. Community service nurses left the higher Education Institution (HEI) without the basic knowledge and skills on ART or HIV management, hence some patients are turned away and advised to come back when there is a NIMART nurse. If this does not happen, then the reports indicate that patients are transferred to another PHC facility or hospital. These factors frustrate student nurses and weaken linkages to health care. Another aspect revealed in this study is the use of unskilled facilitators and ineffective traditional

training strategies that lack integration of theory and practice and result in poor learning outcomes. The study revealed that NIMART training is not recognised by regulatory bodies like SANC or HEI and not regarded as part of continuous professional development to keep nurses and lecturers updated on HIV management. This closely links with the quantitative findings represented in Table 1, 2 and 3, including Figure 1 and 2.

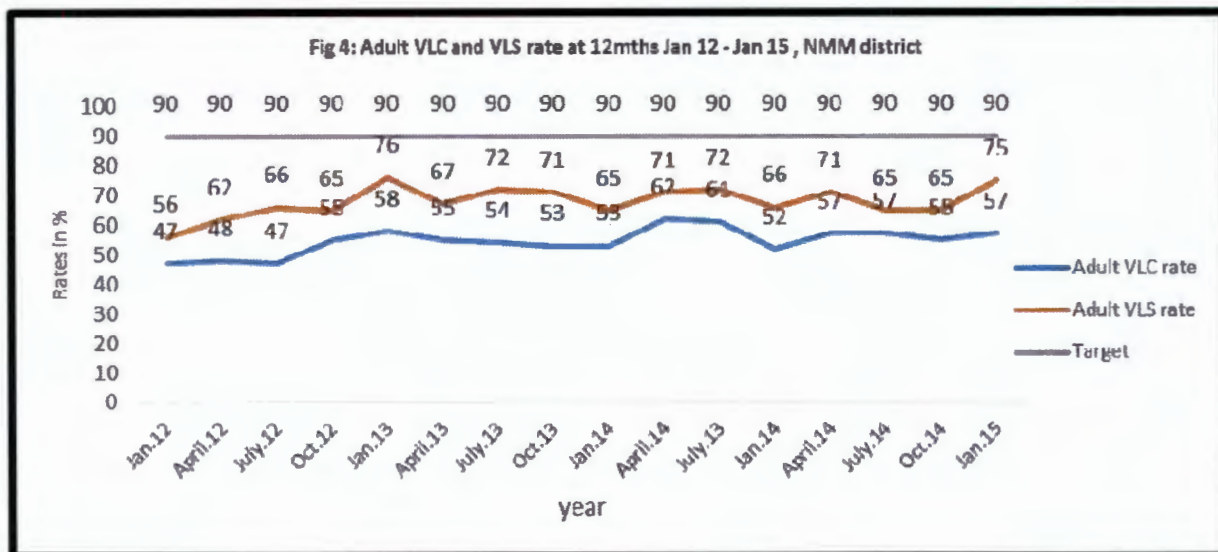
3.3. Instability of total patients remaining on ART (TROA): Poor adherence and retention to care

In addition, the quantitative results revealed fluid and fluctuating patterns in total patients remaining on ART (TROA) as represented in Figure 1 and 2. This was also confirmed by the fluctuation in adults' loss to follow up (LTFU) after 12 months started on ART at an average of 14% and low ART initiation amongst patients who tested positive or eligible for ART as represented in Table 1 and 2 and Figure 1 and 2. This is closely linked with the qualitative findings which include a combination of patients' psychosocial and economic factors, NIMART nurses level of training and health care system challenges.



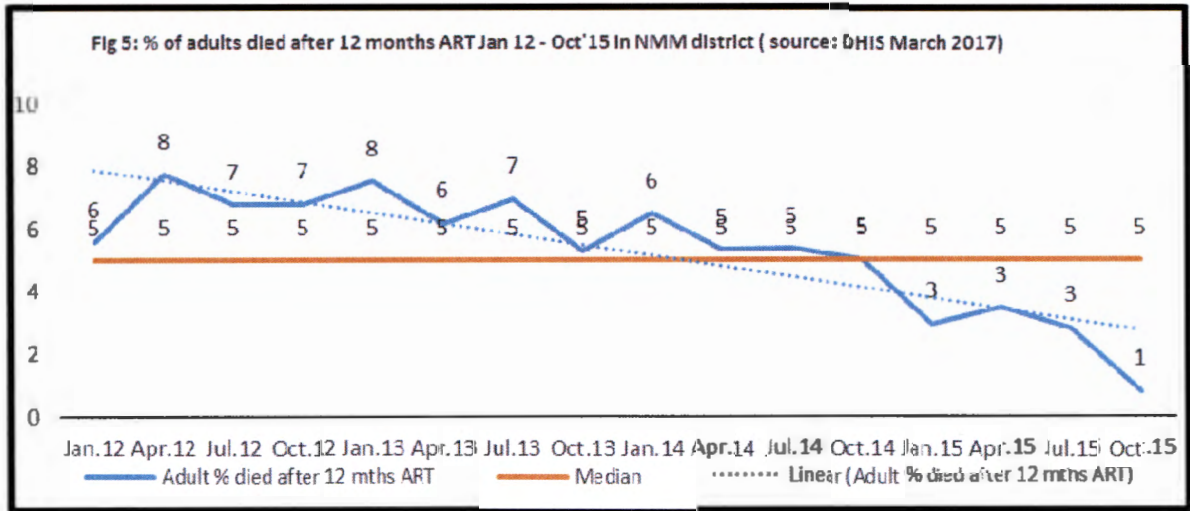
3.4. Poor monitoring of treatment outcomes

The study revealed that even though access in ART has increased, the quality of HIV services to PLWH is unsatisfactory. This is evident in the poor monitoring of viral load rate at 12 months after start on ART which is at an average of 54%, low viral suppression at 56% which is far below the target of 90%, as represented in Figure 4.



The study revealed that the death rate of adults after 12 months starts on ART as represented in Figure 5 is high at 5% and this confirms the qualitative results that

NIMART nurses are not compliant to guidelines despite training, however, the death rate was starting to decline by end of 2015.



4. Conceptual framework: NIMART training implementation

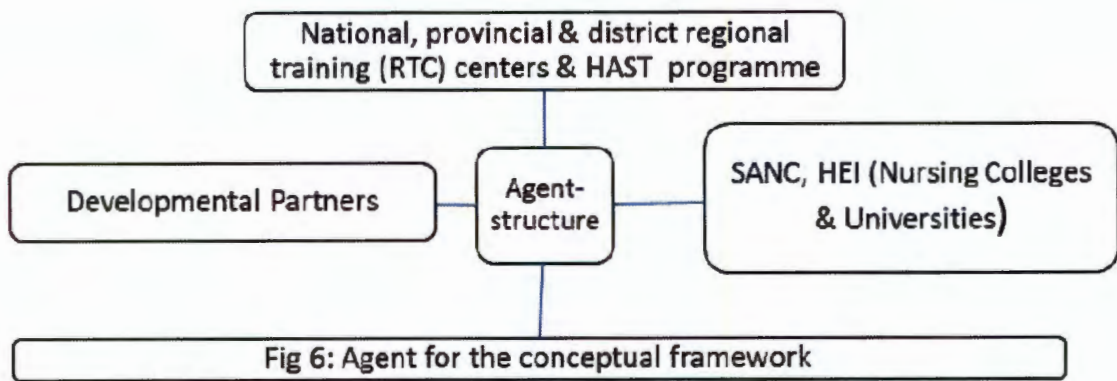
The conceptual framework (CF) was developed based on Dickoff, James and Wiedenbach (1968) practice-oriented theory and Donabedian’s, (1966) SPO model. Both the Dickoff et al. practice oriented theory and Donabedian’s SPO enabled the researcher to identify and incorporate the different features such that these coalesce to provide the emerging phase 1 & 2 results and eventually a CF. The CF is developed and described as follows:

Who is expected to implement the NIMART training conceptual framework? The

Agent

The agent refers to the persons or things that are the implementers of the framework (Dickoff et al, 1968). According to Donabedian’s SPO model this refers to the structure that enables the implementation of the CF, including the recipient and the

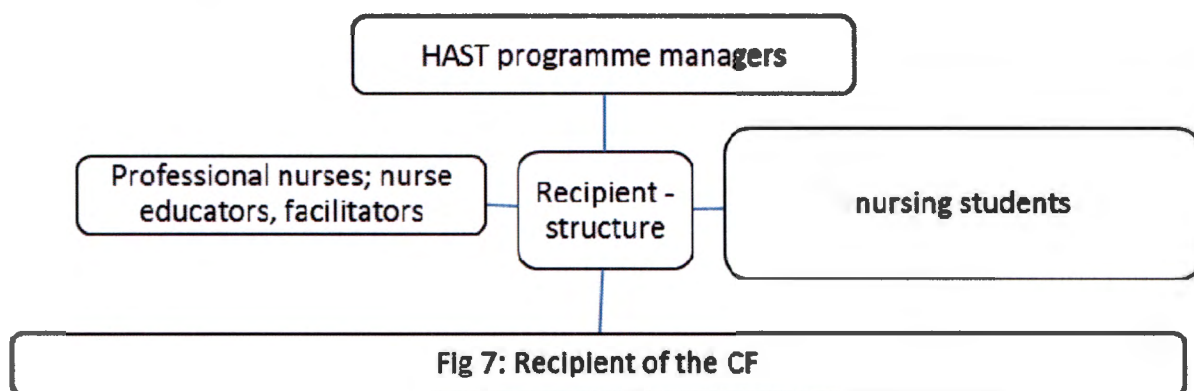
context (Donabedian, 1966). In this study the national, provincial and district regional training centres (RTC), developmental partners including SANC and HEI should implement the framework, as indicated in Figure 6 are the chief implementers. It is evident from the study findings that they lack a conceptual framework to guide and strengthen the implementation of NIMART training that strives to achieve the intended goal of a skilled, confident, competent NIMART nurse cohort that renders quality HIV services and improves patient outcomes. In most instances it does not address the gaps affecting the HIV programme.



Who is the recipient of NIMART training? (Recipient)

According to Dickoff et al., (1968), the recipient is a person or thing receiving action from the agent. In this framework the recipient is any health care worker receiving NIMART training as indicated in Figure 7. These can be professional nurses, facilitators, student nurses, nurse educators or programme managers. According to WHO, task-shifting was recommended for nurses to initiate and manage ART rather than rely solely on the doctors to meet the increasing demand for health care services. It is evident from the study results that the agent should provide

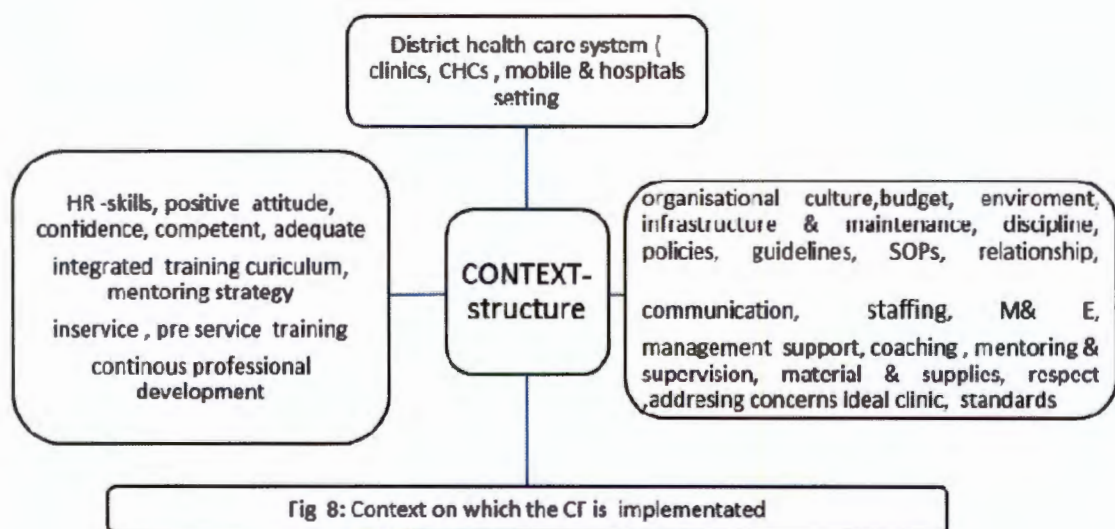
comprehensive quality training to improve the skills, competence and confidence of the NIMART nurse in the provision of quality care to the patients and to facilitators and educators to transfer the skills to these students. In addition, the patients indirectly benefit from the NIMART training as they equally receive care from the NIMART nurse.



In what Context could NIMART training be implemented?

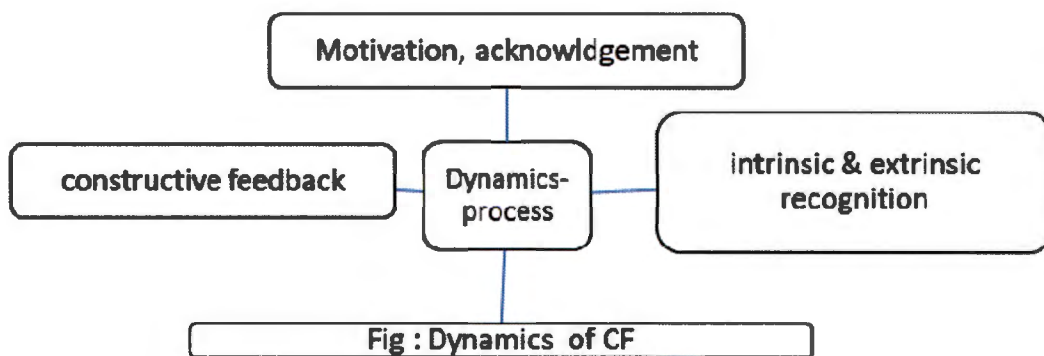
The context refers to resources, activities and environment which enables or facilitates implementation (Dickoff et al, 1968). It is evident from the study that a combination of organisational resources and a conducive, safe and comfortable environment in the district primary health care system can facilitate implementation as indicated in Figure 8. The availability of adequate, independent, experienced, skilled HR with positive attitudes towards PLWH and HIV programme facilitates robust implementation. Again, the development of a standard integrated NIMART curriculum and use of effective interactive strategies that stimulate critical thinking and facilitate integration of theory and practice can influence implementation. Moreover, provision of NIMART /HIV management pre-service training to student

nurses, continuous professional development (CPD) and in-service training on HIV changes can facilitate NIMART implementation. It is evident from the study that availability of good communication and relationship skills, including compliance to HIV/TB and PHC policies, guidelines, protocols and SOPs facilitates implementation. In addition, treating patients and nurses with respect and attending to their concerns or challenges can also facilitate implementation. Furthermore, maintenance of physical infrastructure of the PHC facilities, having enough space, re-organisation of the facility in line with the ideal clinic ICSM standards and reducing waiting times can facilitate implementation and quality. Prioritising the PHC in budget planning is necessary to deal with the overt challenges influencing implementation. Provincial and district management team support, flexibility, coaching and supervision are all necessary to influence and facilitate discipline and meaningful implementation.



What is the support system to improve NIMART implementation? (Dynamics)

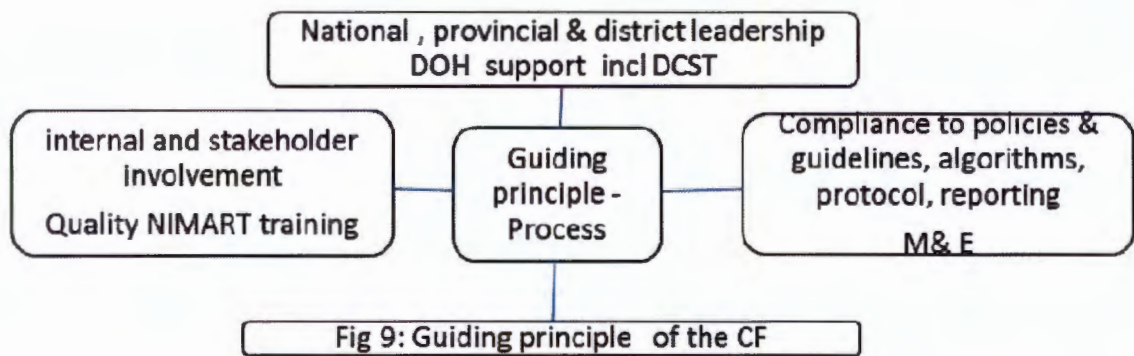
The dynamics refer to the sources of power or energy amongst the activities (Dickoff et al, 1968. According to Donabedians, (1966). This refers to the process that facilitates the implementation of the CF, including the guiding principles. It is evident from the study findings that motivation, acknowledgement and recognition of NIMART nurses for rendering services under difficult conditions substantially influences and facilitates implementation. Intrinsic and extrinsic recognition is necessary to motivate and enhanced performance. This would invariably boost their self-esteem, build confidence, and improve the sense of responsibility and feeling worthy to the department. Again, the Department of Health should meet NIMART nurses' needs and deal with their frustrations. Furthermore, avoiding negative criticism and blame –punishment feedback would exert a massive influence on successful implementation.



What is the guiding procedure or rule? (Principle)

The guiding principle refers to the rule, technique, protocol, routine governing the activities to achieve the terminus (Dickoff et al, 1968). It is evident from the study that quality training, mentoring, support and compliance to policies, guidelines,

SOPs, protocols are the guiding principles that facilitate achievement of patient and framework outcomes. Again, monitoring, reporting and evaluation facilitate identification of gaps, signs of danger & success to arrive at the terminus. Another principle to facilitates and influence implementation is involvement of all internal and external stakeholders, which includes district clinical specialist teams (DCST), facilitators, RTC managers, the province and district leadership developmental partners, HEI, SANC, HWSETA in implementation.

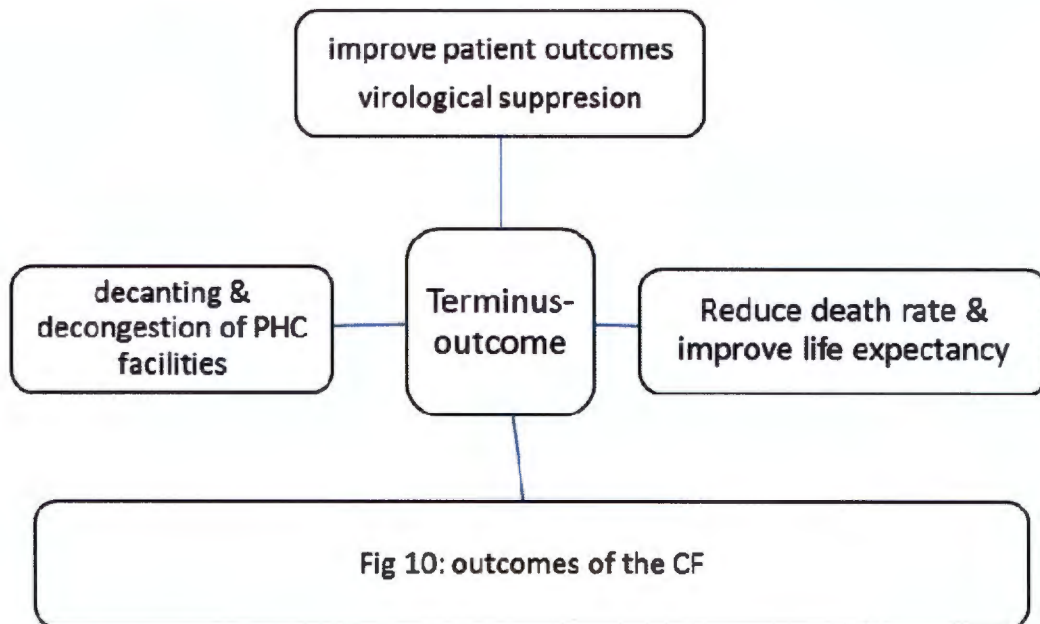


What is the outcome of implementation of NIMART training Conceptual framework? (Terminus)

Terminus refers to the outcomes or end results of the activity (Dickoff et al, 1968). Donabedian, (1966) describes a terminus as the end product or outcomes of the structure and process. It is evident from the study findings that the outcomes of effective and efficient implementation of NIMART training facilitates the production of confident, competent and skilled NIMART nurse complaint to polices and guidelines. This will facilitate improvement of patient health status by increasing linkages to ART, improve adherence and retention to care, low LTFU, viral

suppression and decanting of stable patient and relieve pressure on NIMART nurses. Further this facilitates reduction of death rate and increases life expectancy.

Fig 10 indicates the expected outcomes of the recipients.



The Dickoff's six survey list and Donabedian's SPO was categorised and classified with the characteristics and activities from the study findings to develop a conceptual framework that can facilitate and influence improvement of NIMART training and implementation in the NW district health system thus improve outcomes as represented in Fig. 11

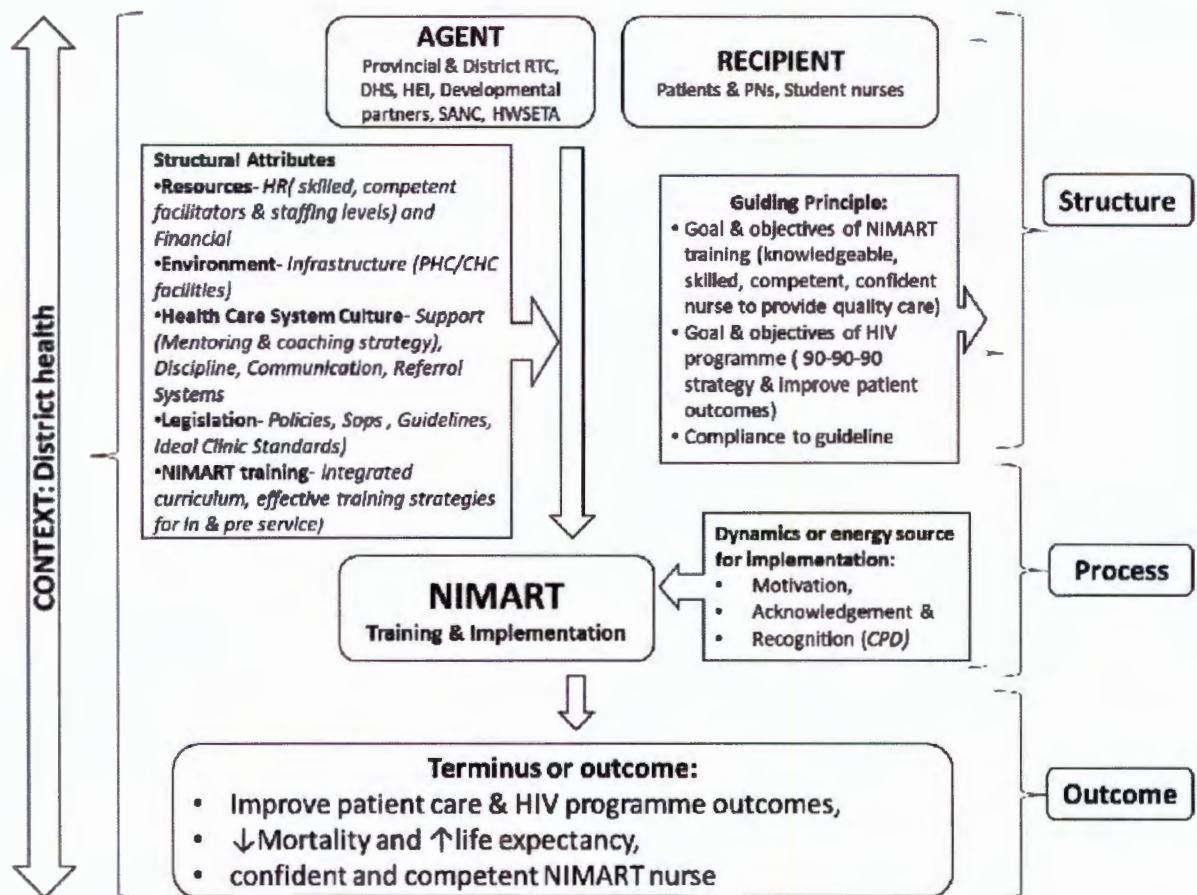


Fig 11: Conceptual framework for strengthening NIMART Training and HIV management implementation

5. Discussion

The purpose of the study was to conceptualise the study findings to develop and describe a conceptual framework that provides guidance and strengthens NIMART training and implementation in order to improve patient and HIV programme outcomes in the NW province. The CF was developed based on Dickoff's practice orientated theory and Donabedian's SPO model. The study found that even though access to ART has increase, ART initiation versus HIV positive patient is low especially amongst children and ANC pregnant and poses risk of mother to child transmission, while nurses are trained on NMART. Abuogi, Smith and McFarland (2016) indicate that failure to initiate or retain children on ART leads to early mortality. According to van der Walt, Lancaster & Shean (2016); Anigilaje et al.

(2016) and Teklu et al. (2017), early ART initiation reduces transmission of HIV infection, death and incidence of TB. Deconinck et al. (2015) and Adedinsewo et al. (2014), also confirms that timing of ART initiation also reduces opportunistic infection and improves the health of PLWHV. Reddy et al. (2016), Gesesew et al. (2017) and McNairy et al. (2017) confirm that poor linkage of HIV positive patients to care results in early LTFU and delayed ART initiation. Grimsrud et al. 2015, indicate that reorganisation of ART programme and proper down referral system could reduce LTFU. The universal test and treat policy should be implemented to improve patient outcomes to achieve the 90-90-90 targets (UNAIDS , 2014).

Monitoring of patient on ART is poor and exposes patients to drug resistance, complications and death. Monitoring assists in early identification of drug interactions, treatment failure and early switching to other drugs or regimen (Wilhelmson et al. 2016 & Cope et al. 2015). Life expectancy of PLWH could be improved if LTFU is considered seriously (Patterson et al. 2015). It is evident from the study that NIMART nurses still lack confidence and competence due to level of NIMART training and mentoring received with the combination of the organisational factors influencing implementation (Davies et al. 2013; Mack et al. 2015; Mbonye et al. 2016; Nyasulu et al. 2013; Oladele et al. 2017; Owens & Moroney et al. 2015). It is evident from the study findings these barriers should be dealt with decisively to improve outcomes. De La Mata et al. (2017) indicates that facility resources contribute to implementation and reduction of LTFU. NIMART nurses did not comply with guidelines and compromised quality. The study revealed lack of conceptual framework to guide NIMART training and implementation and was developed based on the study findings.

6. Conclusion

There is no significant impact of NIMART training with regard to quality in HIV care and management even though PNs are trained on NIMART. However, expansion of the ART programme and access to ARVs to the PHC level has been

achieved in the NW province. It is evident from the study findings that various factors such as health care system, patients and training outcomes influence implementation of the NIMART training. Therefore, it is of utmost importance to conceptualise the study findings and develop a conceptual framework that could influence and facilitate improvement of the NIMART training and implementation. Dickoff et al. (1968) practice-orientated theory and Donabedian's SPO model provided a starting point in the development of the framework. There is no such a framework in the NW province and South Africa as a whole. Therefore, the study contributed much to the improvement of NIMART training and implementation and to the body of knowledge in the field of nursing practice, education and training. However, further studies could be conducted to develop a model that can be tested and validated.

7. Limitations of the study

The study was limited to one district in the North West province only, focusing on the PHC and did not include hospitals. Despite these limitations, the study findings are significant as there is no such conceptual framework in the province and South Africa.

8. Practical implications of the study

With reference to study findings, the conceptual framework developed could facilitate improved implementation of NIMART training in the PHC facilities thus achieve patient and HIV programme outcomes. Again, the NINART training can be improved to produce a skilled, competent and confident nurse who can provide quality HIV and healthcare services. Dealing with challenges influencing the NIMART training can facilitate compliance to policies and guidelines thus improve outcomes.

9. Competing interest and acknowledgement

There are no financial or personal relationships that may have inappropriately influenced in writing this article. The study is funded by NRF and promoted by

NWU. A special thanks to the Librarian for the support, guidance and assistance in literature search.

11. Author's contribution

S.H.M was responsible for conducting the study which includes; data collection through literature search, analysis, development of conceptual framework and writing the manuscript and L.M was responsible for writing and editing the abstract and manuscript for the final submission.

References

- Anigilaje, E.A., Aderibigbe, S.A., Adeoti, A.O., & Nweke, N.O. (2015). Tuberculosis, before and after antiretroviral therapy HIV-Infected children in Nigeria: What are the risk factors? *PLoS ONE* 11(5): 1-19
- Adedinsewo, D.A., Wei, S.C., Robertson, M., Rose, C., Johnson C.H., *et al.*, (2014). Timing of antiretroviral therapy initiation in a nationally representative sample of HIV -infected adults receiving medical care in the United States. *AIDS PATIENT CARE and STDs*. 28 (12):613-621).
- Babbie, E. and Mouton, J. (2011). *The Practice of social research*. Edited by Vorster, P. and Prozesky, B. Cape Town: Oxford University Press.
- Byakika-Kibwika, P., Kutesa, A., Baingana, A., Muhumuza, C., Kitutu, F.E., *et al.*, (2015). A situation analysis of inter-professional education and practice for ethics and professionalism training at Makerere University College of health sciences. *BMC research notes*, (2015) 8:598.
- Creswell, J.W. (2009). *Research design. A quantitative, qualitative and mixed method approaches*. (3rd Ed). SAGE: Los Angeles.

- Cope, R., Pickering, A., Glowa, T., Faulds, S., Peter, B.A., *et al.*, (2015). Majority of HIV/HCV Patients need to switch antiretroviral therapy to accommodate direct acting antivirals. *AIDS PATIENT CARE and STDs* 29(7): 379-383)
- Davies, N., Homfray, M., & Venables, E.C. (2013). Nurse and manager perception of nurse initiated and managed antiretroviral therapy (NIMART) implementation in South Africa: a qualitative study. *BMJ open*, 2013(3): 1-9.
- Deconinck, L., Yazdanpanah, Y., Gilson, R.J., Melliez, H., Viget, N., *et al.*, (2015). Time to initiation of antiretroviral therapy in HIV-infected patients diagnosed with an opportunistic disease: a cohort study. *British HIV Association* 2016(16): 219-229
- De Vos, A.S., Strydom, H., Fouche. C.B., and Delport, C.S.L. (2012). *Research at Grass roots for the social sciences and human service professions*. 4th ed. Van Schaik publisher: Pretoria.
- Dickoff J., James, P and Wiedenbach E. (1968). Theory in practice discipline part 1: practice oriented theory. *American Journal of Nursing Company* 7(5), 415-451
- Gesesew, H.A., Ward, P., Woldemichael, K., and Mwanri, L. (2017). Prevalence, trend and risk factors for ART discontinuation among HIV-infected adults in Ethiopia in 2003-2015. *Public library of science*, 12(6): 1-16.
- Grimsud, A., Kaplan, R., Bekker, L-D., and London, M. (2014). Outcomes of a nurse – managed service for stable HIV –positive patients in a large South African public sector ART programme. *Tropical medicine and international health* 19(9):1029-1039
- Grove, S.K., Burns, N and Gray, J.R. (2013). *The Practice of Nursing Research: Appraisal, Synthesis, and Generation of Evidence*. 7th ed. Elsevier: Saunders.
- Joint United Nations programme on HIV/AIDS. Global report. (2013). Republic of Uganda. Kampala. Uganda: UNAIDS, 2014.

- Joint United Nations programme on HIV/AIDS. 90-90-90 strategy. (2014). an ambitious treatment target to help end the AIDS epidemic. Geneva: UNAIDS, 2014.
- Joint United Nations programme on HIV/AIDS. The gap report. Geneva: UNAIDS, 2014.
- Joint United Nations programme on HIV/AIDS. Global AIDS update. (2016). Geneva: UNAIDS, 2015.
- Kaposhi, B.M., Mqoqi, N., & Schnopflocker, D. (2014). Evaluation of antiretroviral treatment programme monitoring in Eastern Cape. South Africa. *Health policy and planning*, 2014: 1-8
- Lekhuleni, M.E., Kgole, J.C., & Mbombi, M.O. (2015). Knowledge of student nurses in nurse initiated and management of antiretroviral therapy at the University Of Limpopo, South Africa. *African journal for physical, health education, recreation and dance* 1(1): 53-61
- LoBiondo-Wood, G. and Haber, J. 2010. Nursing Research: Methods and critical appraisal for evidence based practice. (7th Ed). Mosby Elsevier: New York.
- Mack, N., Wong, C., McKenna, K., Lemons, A., Odhiambo, J., *et al.*, (2015). Human resource challenges to integrating HIV pre-exposure prophylaxis into the public health system in Kenya. *African journal of reproductive health* 19(1): 54-62
- Mbonye, M.K., Burnett, S.M., Naikoba, S., Ronald, A., Colebunders, R., *et al.*, (2016). Effectiveness of educational outreach in infectious diseases management: a cluster randomized trial in Uganda. *Biomed central public health*, (2016)16:714
- Moher, M., Liberati, A., Tetzlaff, J., & Altman, D.G. (2009). Preferred reporting for systematic reviews and meta-analysis: The PRISMA statement. *PLoS med* 6(7): 1-

- Mouton, J. & Marais, H.C., (1996). Basic concepts in the methodology of social sciences. Human science research council: Pretoria. South Africa. (www.hsrcpress.ac.za).
- Munhall, P.L. (2012). *Nursing research. A qualitative perspective.* (5th Ed). Jones and Barlett learning: Canada.
- National Department of Health. (2011). Clinical mentorship manual for integrated services. Pretoria. South Africa
- National Department of Health. (2014). National consolidated guidelines for the prevention of mother –to- child transmission of HIV and the management of HIV in children, adolescents and adults. 2015: Pretoria. South Africa
- North West province department of health. (2015-2016). Annual performance plan. Mafikeng. South Africa
- North West province department of health. District health information system database. (2015). Mafikeng. South Africa. Time series (2012-2015)
- North West province department of health five year strategic plans. (2015- 2016- 2019/2020). Mafikeng. South Africa
- Nyasulu, J.C.Y., Muchiri, E., Mazwi, E., & Ratshefola, M. (2013). NIMART rollout to primary health care facilities increases access to antiretroviral in Johannesburg: An interrupted time series analysis. *South African medical journal of HIV* 103(4): 232-236
- Oladele, E.A., Khamofu, H., Asala, S., Safeh, M., Ralph-Opara, U., *et al.*, (2017). Playing the catch –up game: Accelerating the scale-up of prevention of mother to child transmission of HIV (PMTCT) services to eliminate new paediatric HIV infection in Nigeria. *Public library of science*, 17(1): 1-6
- Ousman. K., Polomano, R.C., Seloilwe, E., Odero, T., Tarmo, E., *et al.*, (2016). Inter professional fellowship training for emerging global health leaders in Africa to

improve HIV prevention and care: *The Afya Bora consortium. Journal of the association of nurses in AIDS CARE, 27(3):331-343*

Owens, A., and Moroney, T. (2015). Shifting the load: improving bioscience performance in undergraduate nurses through student focused learning. *Collegian. Science direct 24(2017):37-43*

Spies, L.A., Gray, J., Opollo, J., & Mbalinda, S. (2016). HIV and Nurses: A focus group on task shifting in Uganda. *Journal of the association of nurses in AIDS CARE, 27(3):179-182.*

Teklu, A.M., Nega, A., Mamuye, A.T., Sitotaw, Y., Kassa, D., *et al.*, (2017). Factors associated with mortality of TB/HIV co-infected patients in Ethiopia. *J Health Science 27 (10): 29-38*

Umanah, T., Ncayiyana, J., Padailam, X., & Nyasulu, P.S. (2015). Treatment outcomes in Multidrug resistant Tuberculosis- human immunodeficiency virus co-infected patients on anti-retroviral therapy at Sizwe Tropical Disease Hospital Johannesburg, South Africa. *BMC infectious diseases 2015 (15): 1-13.*

Van der Walt, M., Lancaster, J., & Shean, K. (2016). Tuberculosis case fatality and other causes of death among multidrug –resistant tuberculosis patients in a high HIV prevalence setting, 2000-2008, South Africa. *PLOS ONE 11(3):*

Reddy, E.A., Agala, C.B., Maro, V.P., Ostermann, J., Pence, B.W., *et al.*, (2016). Test site predicts HIV care linkage and ART initiation: a prospective 3.5 year cohort study of HIV-positive testers in northern Tanzania. *BMC 16 (497):1-10*

Patterson, S., Cescon, A., Samji, H., Chan, K., Zhang, W., *et al.*, (2015). Life expectancy of HIV –positive individuals on combination antiretroviral in Canada. *BMC infectious Diseases. 2015(15): 4-10*

Polit, D.F and Beck, C.T. (2011). *Essentials of Nursing Research: Appraisal Evidence for Nursing Practice*. (7th Ed). Wolters Kluwer. Lippincott. Williams and Wilkins.

Wilhelmson, S., Reepalu, A., Balca, T.T., Jarso, G., & Bjorkman, P. (2016). Retention in care among HIV-positive patients initiating second –line antiretroviral: a retrospective study from an Ethiopian public hospital clinic. *Global health Action* 2016(9): 1-8.

World Health Organization. HIV/AIDS programme strengthening health services to fight HIV/AIDS. Geneva: WHO, (2007). [http://www.who.int/hiv/toroto2056/talking stock](http://www.who.int/hiv/toroto2056/talking%20stock) tr. Date access: 18 October 2017

World Health Organization. *World health statistics*. Geneva: W

Zuber, A., McCathy, C.F., Verani, A.R., Msidi, E., & Johnson, C. (2014). A survey of nurse initiated and managed antiretroviral therapy (NIMART) in practice, education, policy and regulation in East, central and Sothern Africa. *Journal of the association of nurses in AIDS CARE*, 25(6):520-531.

SECTION THREE

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

INTRODUCTION

The previous section consists of four manuscripts which were written for publication in *Curationis*, *Health SA Gesondheid (HSAG)* and *International Journal for African Nursing Sciences (IJANS)*. This final section of the research includes the conclusions, limitations and recommendations for strengthening NIMART training and implementation in HIV management. Limitations presented here reflect the entire study. Recommendations based on nursing education, research and practice are also submitted.

CONCLUSIONS

The study was conducted in phases where phase one covered the systematic literature review on NIMART training or HIV management and implementation that provided an in-depth understanding of the study phenomenon. In Phase 2, the aim was to determine the impact of NIMART training on HIV management by evaluating the performance of ART indicators. Phase 3 explored and described challenges influencing the implementation of NIMART training based on the findings of Phase 2 to reach informed and quality conclusions and recommendations for improvement. The final and fourth phase aimed at making inferences and interpretations of the findings of phase 2 & 3 conceptualized these in order to develop a conceptual framework for strengthening NIMART training and implementation in the NW province, thus improving patient and HIV programme outcomes. The conclusion according to manuscripts is hereby described as follows:

Conclusion: Manuscripts one: Comprehensive literature review: NIMART training and implementation

Although task-shifting and NIMART training have helped to increase ART uptake, the literature revealed that more should be done to provide quality care to PLWH through strengthening of adherence and disclosure, reducing loss to follow up and to keep patients on ART virally suppressed. Again, measures to improve continuity of HIV care should include the use of interactive training strategies that stimulate critical thinking in decision-making with regard to HIV care. Dealing with factors that hinder implementation is of great importance and the development of a comprehensive integrated framework is necessary to guide NIMART training and implementation.

The literature provided a clear picture of the gaps and recommendations that could improve NIMART training and implementation. Various methods were used and provided the researcher with an opportunity to choose mixed methods to obtain a clear perspective of the gaps, observed in practice. Literature did not reveal the availability of any conceptual framework that can guide NIMART or HIV management training globally and in South Africa and this is a gap that this study can contribute to the nursing, education and practice's body of knowledge. To reach this stage, other aspects had to be investigated which include the impact of NIMART training on HIV management as well as barriers or challenges that influence implementation to make a sound conclusion.

Conclusion: Manuscript two: The impact of NIMART training on HIV management

The study revealed that there is a significant impact of NIMART training on HIV management in terms of expansion and decentralization of the ART programme to the DHS PHC facilities from NMM district, however, new ART initiation is still far too low to reach 90%, especially amongst children and ANC pregnant women, despite changes in eligibility guidelines. ART monitoring, adherence and retention

to care are poor and contribute to fluctuation of TROA. The study findings reveal that there is a poor compliance to guidelines and this has a negative impact on the quality of care. Again, the need to strengthen NIMART training and explore barriers influencing implementation should be investigated to achieve the desired HIV programme outcomes.

The HIV programme failed to achieve its intended outcomes of 90-90-90 strategy. Both new ART initiation, VL done and suppression are below targets, while nurses are trained on NIMART. The RTC has achieved its target of having 75% of PNs trained on NIMART in each facility, however, there are still few PNs who are not trained while, amongst those trained, some are not assessed and certified for competency which might influence the confidence and competency of NIMART nurses to provide quality HIV care. Reasons need to be explored to make informed conclusions.

Conclusion: Manuscript three: Challenges regarding implementation of NIMART training

Significant challenges influencing the quality of the implementation of NIMART training were revealed and these include NIMART training strategies, health care system and patient factors which all have to be dealt with to achieve better patient and HIV programme outcomes. However, few participants revealed any positive impact that the NIMART training has borne, which include improving knowledge on HIV management, increasing access to care in terms of expansion of ART programme by PNs in NMM district PHC facilities.

The study revealed that gaps still exist in NIMART training such as lack of a standard and integrated curriculum, partner-driven training and mentoring that cannot be sustained, use of traditional training methods and unskilled facilitators. The study also revealed that in-service training is lacking and results in poor compliance to guidelines. Again, there are gaps in HEI curriculum, NIMART or HIV management is not included and students exit from these institutions without

meeting the pre-requisite knowledge and skills to manage HIV patients. Recommendations were made to close the gaps and improve NIMART training and implementation and include the development of the conceptual framework.

Conclusion: Manuscript four: Conceptual framework for strengthening Nurse-Initiated Management of ART Training and Implementation in North West Province.

The improvement of NIMART training and implementation is dependent on the development of a conceptual framework based on Dickoff et al.'s (1968) practice-oriented theory six survey list and Donabedian's (1966) structure, process and outcome model. In a nutshell, the implementation of the six aspects of activities facilitates the introduction of benefits in the PHC setting such as the development of a skilled, competent and confident NIMART nurse who complies with policies and guidelines, enhancing the provision of quality HIV and other PHC services, thus improving patient and HIV programme outcomes.

The conceptual framework provides a clear guidance on how it can be applied, who should implement (agents), the recipients and the guiding principles for implementation, terminus, the dynamics and the context which can facilitate implementation. The agent and the recipients in accordance to Dickoff's practice theory in line with the structure of Donabedian's model, the dynamics, context and guiding principle as the processes in which NIMART training and HIV management occurs and the terminus as the outcome of both NIMART training and the HIV programme. The provincial and district leadership and management and RTCs as agents of the CF should take a lead and provide direction and support by ensuring that the context in which the CF should be implemented is given the necessary attention and priority for the recipients to benefit and produce the intended outcomes. The goals and objectives of the NIMART training and HIV programme should be the guiding principles in improving training and implementation and achieving the planned outcomes. Motivation and recognition of both NIMART

nurses and patients are strong dynamic processes that should be adopted to improve adherence and compliance to guidelines. It is evident from the study findings that the implementation of the recommendations together with conceptual framework can improve NIMART training and implementation. The conceptual framework has contributed adversely to nursing practice and training.

General conclusion

It is evident from the study findings presented in this thesis that NIMART training and implementation still have gaps, even though it has resulted in great expansion of the ART programme in the NW province and South Africa. The study confirms that it is imperative to implement the developed conceptual framework for strengthening nurse-initiated Management of ART training and implementation. The literature also confirms that this is the only CF to facilitate and positively influence the NIMART training and implementation in the North West province and South Africa as a whole, to achieve the goals and objectives of the HIV /ART programme. The CF is described in detail in Section two, Manuscript four and also represented in Figure 11. The Dickoff practice –orientated theory and Donabedian’s SPO model are of significance in providing a focal point for the development of the framework. Other recommendations made in this thesis should also be taken into consideration by provincial and district leadership & the RTC to improve quality. The researcher can provide support, coaching and mentoring on the implementation of the framework.

LIMITATIONS OF THE STUDY

The study was limited to one district in the NW province and the focus was on the selected PHC facilities of the NMM district statistics of the ART indicators which provided insight on the performance, quality of HIV programme compared to the number of nurses trained to render ART services, including exploring of barriers influencing implementation but did not include hospitals. Even the ART services

have been decentralized to the PHC level. Hospitals and mobile teams were excluded, despite these limitations being overcome by the use of mixed methods and triangulation of designs to obtain a clear understanding of the phenomena from different perspectives. The study findings can be generalized to the North West province. The study also has significant impact on the development of conceptual framework that will guide the province and South Africa to improve NIMART training from the RTCs, HEI and SANC. HWSETA and implementation in hospitals & PHC facilities.

RECOMMENDATIONS

The study identified and submits the following recommendations:

Standardization of NIMART or HIV management curriculum

The national, provincial and district RTCs as agents or implementers, with the support of national, provincial and district leadership, HEI, SANC and developmental partners should develop a comprehensive integrated curriculum informed by challenges or gaps in HIV management. The curriculum should also direct implementers to use facilitation strategies that stimulate critical thinking and facilitate integration of theory to practice, in order to produce a competent and confident NIMART nurse and to improve patient outcomes.

The RTCs should always equip facilitators with the necessary skills and knowledge needed to provide quality NIMART training to nurses and other health care workers. NIMART trainers also need to attain facilitation or health sciences education, mentoring & coaching and assessor skills.

The Department of Health and SANC should issue a directive for HEI to review the curriculum and integrate NIMART /HIV management like IMCI as pre-service course and monitor compliance, in order to produce nurses who will render quality care and also address the needs of the community.

The SANC is in the process of implementing CPD for nurses, therefore NIMART or HIV management training can be one of the courses as there are continuous changes on the guidelines and management due to research studies conducted with the purpose of reducing new infection, control of the epidemic world-wide and finding a cure.

Integration of common gaps in the NIMART /HIV management training

The curriculum should be reviewed timeously to include common gaps and challenges influencing HIV management like data management. Most clinical staff lack knowledge and skills on data management and affects the performance of the HIV and TB programme. This can be included in the training curriculum as a practical skill to improve recording, reporting and capturing. Training of clinical staff on the national indicators is necessary to understand what and how to report. NIMART nurses need to be trained in all clinical registers. OPMs also need this training, especially the verification and validation of data to improve quality and facility performance.

Conducting continuous in-service training

It is imperative that the RTCs, together with HIV programme managers and developmental partners, keep facilitators, mentors, nurse educators and DCST up to date of current guidelines so that they can further capacitate NIMART nurses and students to improve compliance and patient outcomes of HIV programmes in the PHC facilities to achieve better outcomes. All NIMART nurses should be reached out to.

Development of district mentoring strategy

It is evident from the study findings that mentoring is partner driven. The province and district are not implementing the clinical mentoring guide developed by NDoH. The district management team, together with the RTCs, programme managers, DCST and developmental partners, should develop a functional and active provincial

and district mentoring strategy that can be funded, allocated the necessary resources, implemented and monitored for performance and outcomes. This should be a multi-disciplinary team that can address gaps from different departments with regard to issues related to HIV and TB. The team can also strengthen the referral system, reduce delayed access to care and deal with patients who need advanced clinical care.

Support, mentoring and coaching by programme managers

The programme managers are the agents of the HIV and TB programme and should be highly knowledgeable, skilled, competent and confident to manage the HIV patient, even more so than the NIMART nurse, in order to provide support, coaching, mentoring and to transfer skills. Programme managers should have a schedule for facility visits or meetings to deal with challenges and to ensure compliance to guidelines.

Introduction of various methods of recognition

Acknowledgement and recognition of best performers should be done to motivate NIMART nurses and enhance performance. Both intrinsic and extrinsic incentives can be used to reward good performance and development.

Dealing with health care organization barriers to NIMART implementation

The provincial and district management team, including OPMs, should develop a plan to deal with the shortage of resources, such as human and infrastructure. A budget should be prioritized to close vacant posts and maintenance of the infrastructure. Human resources are very critical in the implementation of the programme and cannot be neglected if department has to achieve its strategic, annual performance, HAST DIP plan and ideal clinic quality standards. The district management team and OPM should implement consequence management to NIMART nurses who are not implementing or not complying with any PHC policies and guidelines.

Improving linkage care

PHC facilities should develop an SOP which will provide guidance on the flow of patients tested HIV positive. This includes adults, paediatric and ANC pregnant women. There should be a proper tracking and tracing policy to ensure that all patients are initiated and up new ART initiations to achieve the 90% target.

Intensifying routine monitoring of patients ART

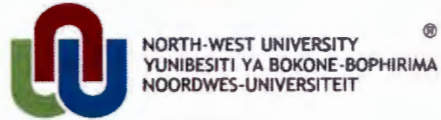
VL collection is necessary to assess the effectiveness of ARVs and early identification of drug resistance for the clinicians to switch to another drug or to refer patients for advance clinical care and change to another regimen. The data team should generate reports for all patients due for VL collection according to the cohorts and make it accessible to clinicians to collect bloods. Patients missed should be traced as per tracing policy. The date of collection and results should be recorded in the clinical stationery and captured in Tier.net. Facility VL QI projects can be initiated to improve monitoring. NIMART nurses and OPM should conduct weekly file audits and provide feedback to improve recording and patient outcomes.

SUMMARY

The study literature and findings confirm that NIMART training still has gaps that influence the implementation and quality of the HIV programme as evident from the poor performance of the programme indicators outcomes. This is also supported by literature in South Africa, Africa and internationally. Various barriers hindering performance and achievement of goals and objectives of NIMART training and HIV management were identified in the study. The main gap identified and achieved was the development of the conceptual framework to guide and strengthen NIMART training and implementation in the NW province. It is highly recommended that all relevant stakeholders should adopt and implement the conceptual framework to achieve the intended goals and objectives of the HIV programme's strategic plans.

Further studies could be conducted to implement and evaluate the conceptual framework with the NDoH, Provincial and District RTC, including other relevant stakeholders, in order to adopt it.

Annexure A: Ethical Clearance



NORTH-WEST UNIVERSITY
YUNIBESITHI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Private Bag X8001, Potchefstroom,
 South Africa, 2520

Tel: (018) 299-4900

Faks: (018) 299-4910

Web: <http://www.nwu.ac.za>

Institutional Research Ethics Regulatory Committee

Tel: +27 18 299 4849

Email: Ethics@nwu.ac.za

ETHICS APPROVAL CERTIFICATE OF PROJECT

Based on approval by the Health Science Ethics Committee (FAST-HSEC) on 07/09/2017 after being reviewed at the meeting held on 07/09/2017, the North-West University Institutional Research Ethics Regulatory Committee (NWU-IRERC) hereby **conditionally approves** your project as indicated below. This implies that the NWU-IRERC grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the project may be initiated, using the ethics number below.

Project title: Conceptual framework for strengthening nurse initiated management of ART Training and Implementation in North West province																															
Project Leader/Supervisor: Dr L Makhado																															
Student: SH Mboweni																															
Ethics number:	<table border="1"> <tr> <td>N</td><td>W</td><td>U</td><td>-</td><td>0</td><td>0</td><td>6</td><td>0</td><td>7</td><td>-</td><td>1</td><td>7</td><td>-</td><td>A</td><td>9</td> </tr> <tr> <td colspan="3">Institution</td> <td colspan="5">Project Number</td> <td colspan="2">Year</td> <td colspan="5">Status</td> </tr> </table> <p><small>Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation</small></p>	N	W	U	-	0	0	6	0	7	-	1	7	-	A	9	Institution			Project Number					Year		Status				
N	W	U	-	0	0	6	0	7	-	1	7	-	A	9																	
Institution			Project Number					Year		Status																					
Application Type: Single Study																															
Commencement date: 2017-09-07	Expiry date: 2020-09-07																														
Risk:	Minimal																														

Special conditions of the approval (if applicable):

- Approved pending the questionnaire attachment.

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- The project leader (principle investigator) must report in the prescribed format to the NWU-IRERC via HSEC:
 - annually (or as otherwise requested) on the progress of the project, and upon completion of the project
 - without any delay in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.
 - Annually a number of projects may be randomly selected for an external audit.
- The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the HSEC. Would there be deviation from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.
- The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the NWU-IRERC via HSEC and new approval received before or on the expiry date.
- In the interest of ethical responsibility the NWU-IRERC and HSEC retains the right to:
 - request access to any information or data at any time during the course or after completion of the project.
 - to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process.
 - withdraw or postpone approval if:
 - any unethical principles or practices of the project are revealed or suspected,
 - it becomes apparent that any relevant information was withheld from the HSEC or that information has been false or misrepresented,
 - the required annual report and reporting of adverse events was not done timely and accurately,
 - new institutional rules, national legislation or international conventions deem it necessary.
- HSEC can be contacted for further information via Lesetja.Motadi@nwu.ac.za or 018 299 2598.

The IRERC would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the IRERC or HSEC for any further enquiries or requests for assistance.

Yours sincerely

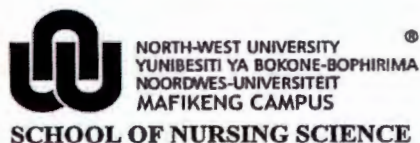
Prof LA Du Plessis

Digitally signed by
 Prof LA Du Plessis
 Date: 2017.10.12
 08:56:20 +02'00'

Prof Linda du Plessis

Chair NWU Institutional Research Ethics Regulatory Committee (IRERC)

Annexure B: Letter to Request Permission to Conduct the Study



RESEARCH AND POSTGRADUATE STUDIES

Tel 0183892236

Email 22891935@nwu.ac.za

Address Office G09 Nursing Building A13, NWU, Mafikeng

To : TO WHOM IT MAY CONCERN: NW PDoH RESEARCH UNIT

From : MBOWENI SH – NWU PHD NURSING –STUDENT- NO 27764400

Re : Letter to request permission to conduct research in Ngaka Modiri Molema

District:

I kindly request approval and permission to conduct the study to develop a Conceptual framework for strengthening NIMART training and implementation in NW province. The purpose of the study is meet the minimum requirements of the PhD degree in Nursing. The study has received approval by the NWU research ethics committee. See Annexure A &B. The study will contribute to nursing practice, education and training body of knowledge through the improvement of NIMART training and implementation and eventually improve patient and the HIV programme outcomes. Further enquiries please contact the researcher @082 826 3153 ; Email: mboweni.sheillah@gmail.com

Kindest



Ms SH Mboweni

PhD Candidate



Prof L Makhado

Supervisor

Acting Program Manager: Research

School of Nursing Sciences

Annexure C: Consent Form

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

TITLE: CONCEPTUAL FRAMEWORK FOR STRENGTHENING NURSE-INITIATED MANAGEMENT OF ART TRAINING AND IMPLEMENTATION IN NORTH WEST PROVINCE

PRINCIPAL INVESTIGATOR/ RESEARCHER:

NAME: MBOWENI SHEILLAH HLAMALANI

DEPARTMENT: School of Nursing Science

ADDRESS: 3088 Hammerkop Street, Thatch field hills, Centurion, 0157

PHONE: 071 151 4754/ 082 826 3153

EMAIL: mboweni.sheillah@gmail.com

PURPOSE OF THE STUDY

You are being asked to take part in the above mentioned study and before you decide to participate, it is important that you understand why the research is being done and what will involve. Please read the following information carefully and ask the researcher if there is anything that is not clear or if need more information. The purpose of the study is to develop a Conceptual Framework for Strengthening Nurse-Initiated Management of ART Training and Implementation in North West Province.

STUDY PROCEDURE

A focus group discussion (FGDs) or interviews will used to collect data from professional nurses who are NIMART trained working in PHC fixed facilities and Programmeme managers directly involve in the management of HAST programme. The interviews will be tape recorded to allow the researcher to transcribe and analyse data after the interview. The interview will be conducted in English lasting for 45minutes-1hour in order to capture all data needed. Each FGDs will have 6-12 participants and will take place in a private room away from work environment. The study will be completed in April 2018.

RISK

There is no direct risk involve , however a minimal psychological discomfort may be experienced during interviews with regard to challenges impacting implementation and will be phrase properly to minimise such and the researcher will reassure participants after the session. You will be allowed to terminate to answer sensitive questions at any time.

BENEFITS

There will be no direct benefit for you in participation in this study however, we hope that the information obtained from this study may improve the following: the body of knowledge and practice with regard to NIMART training and implementation, performance of the HIV and TB programme and health outcomes of the community.

CONFIDENTIALITY

Your response in this study will be anonymous, we will call you by the code assign to you when responding in the FGDs. Do not write your name in the questionnaire for demographic data. Every effort will be made by the researcher to preserve your confidentiality. Assign codes /numbers for participants will be used on all research notes and documents. Keeping interview notes transcription and other identifying participant's information in a locked file cabinet in the personal possession of the researcher. Participants' data will be kept confidential except in cases where the researcher is legally obligated to report specific incidents like abuse and suicide risk.

COMPENSATION

There will be no compensation participation is voluntary.

CONTACT INFORMATION

If you have questions at any time about the study or you experience discomfort as a result of participating in this study, you may contact the researcher whose contact is provided in the first page or if problems arise which you feel cannot be discuss with the researcher, please contact the supervisor or research committee @ 018 389 2236.

VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. You can decide whether or not to take part. If you decide to take part, you will be asked to sign a consent form. Even after you have sign you are free to with draw at any time without giving reason, and will not affect the relationship you have, if any with the researcher.

I have read and understand information and had an opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature

Date

Researcher's signature

Date

Annexure D: Extracted data from original studies with quality assessments scores

Author and year	Country	Purpose	Participants	Methodology(data collection & analysis)	Key findings	QA	comments
Azia et al, 2016	South Africa	Describe challenges faced by patients on ART with regard to adherence to treatment	18 non adherence patients on ART	Descriptive qualitative study, purpose sampling , semi structured interview, manual thematic analysis	Inadequate follow-ups , lack of confidentiality Stigma, unemployment, lack of transport, insufficient ,disability grants were identified as major barriers to adherence	9	Strong Included
Byakika-kibwika et al, 2015	Uganda	Situational analysis of inter professional education and practice for ethics and professionalism training to guide development of a relevant training curriculum of ethics and professionalism	236 under graduate students, 32 teaching health professionals	Mixed methods designs, Cross sectional study, questionnaires and FGDs and key informant interviews Descriptive	Inter-professional education ,practice ,ethics and professionalism are not emphasize in the clinical years and need sensitization and enhancement of mentorship and innovative training strategies	8	Strong Included
Bekker et al, 2016	South Africa	To provide guideline on the use of PrEP (Tenofovir TDF/ emtricitabine FTC)to users and health care workers	17000 people from Uganda, Kenya, Botswana	10 random controlled trial on TDF based PrEp reporting HIV outcomes	Reduction of HIV requisition risk by 51% on women and men Development of PrEp guidelines for southern Africa	7	included in references
Bluestone et al, 2013	USA	To identify effective training approaches for health worker continuing professional education (CPE)	37 full text studies reviewed .32 randomized controlled trials	Programme evaluation , randomized control trial	Evidence suggest that the use of multiple techniques that allow interaction and enables participants to process and apply information and this includes : case base learning , clinical simulation, practice and feedback, didactics that involve passive instructions such as reading or lecture has little or no impact on learning outcomes	7	Strong Included
Chew et al, 2012	USA	<i>Development, implementation and</i>	18 second year students	Programme development, description and evaluation	Increase knowledge and confidence in serving the PLWH	8	Strong Included

Colombini et al, 2014	USA	<i>evaluation of a student-initiated undergraduate medical education elective in HIV care to increase knowledge among students and prepare them to serve the affected population</i>	Review evidence on the factors influencing maternal and infant drug adherence to preventing MTCT drug regimens at delivery in Sub Saharan Africa	14 studies on adherence published Jan 2003-september 2011	Self-assessment of HIV knowledge prior and after Prelerkship HIV elective. Using different teaching strategies: lecturers, small group discussions, clinical observations, community placements, reading assignment, HIV counselling and testing workshop, liker scale	Quantitative research designs	Studies reveal the following as factors influencing adherence Quality and timing HCT, late distribution of NVP socio demographic factors	8	Strong Included
Crowley and Stelleberg, 2015	South Africa	To evaluate the adequacy of pharmaceutical services for the provision of ART in PHC clinics.	20 PHC Facilities in KZN 12 provincial and 6 local government clinics	20 PHC Facilities in KZN 12 provincial and 6 local government clinics	Quantitative descriptive study Data collection instrument developed in line with WHO M & E ART tool Structured observation Microsoft excel No parametric test	Quantitative descriptive study Data collection instrument developed in line with WHO M & E ART tool Structured observation Microsoft excel No parametric test	Insufficient storage space, inadequate security, poor a stock outs of essential drugs, PN performed task of managing drugs supply, prescribing and dispensing medication as there is no pharmacy or pharmacy assistant This add strains to PNs	8	Strong Included
Davies et al, 2013	South Africa	Explore nurses, facility and programme managers perceptions of NIMART implementation	25 nurses and 18 managers	25 nurses and 18 managers	Qualitative , FGD interviews, purposive sampling	Qualitative , FGD interviews, purposive sampling	Nurses and managers felt empowered by this role despite challenges of shortage of HR , inadequate training, clinical mentoring and health systems issues	8	Strong Included
Duncombe et al, 2015	USA	Development of HIV care patient centred framework that will	30 full text studies	30 full text studies	Systematic literature review	Systematic literature review	Literature and examples of models and evidence of impact was used to develop a Framework for delivering HIV care and	6	Included

Iwu et al, 2014	USA	get more people on ART before they became ill	34 literature reviewed	Systematic review on Full text task shifting publications, in depth review	treatment: people centred. Cost effective and acknowledge of best practices	7	Strong Included
Kaposhi et al, 2014	USA	Evaluate the impact/ outcome of task shifting in nurses initiating ART	34 facilities providing ART by nurses in rural sub districts	Qualitative study, purposive sampling Semi structured interviews , data quality audits SPSS version 19 used to analyse data	Over reporting of data due to lack of training on ART registers , data elements definition during NIMART, Data verification not done by OPM , ,staffing levels, shortage of NIMART trained nurses,	6	Strong Included
Knight et al , 2015	SA	Determine the impact of combination ART initiation on adherence to TB Rx to reduce reluctance among health care workers to start combination ART in TB patients	50 TB/HIV patients with CD4 count 50- 350 cells/mm. Sept 2011 –Oct 2012	Prospective observational cohort study, self-report , pill count, electronic medication event monitoring system before and after ART initiation Questionnaire , medical files review analyses	Decreased adherence to treatment in patients with TB /HIV infection and associated with poor outcomes, development of resistance and requires adherence support	8	Strong Included
Kompala et al; 2016	USA	To determine impact of community based CD4, Testing services on facilitating Pre art	160 HIV positive adults, 18 PHC facilities	Retrospective study , comparing before & after the presence of , questionnaire phlebotomy nurse Tracing of patients, referred to local facility for initiation based on eligibility criteria, Chi Square test	7213 access screening services, reduced loss of pre ART care and facilitate timely access to ART. availability of CD4 phlebotomy may reduce loss	8	included
Kufa et al, 2014	USA	To evaluate the effect of an intervention to optimize TB/HIV service integration on mortality, morbidity and retention in care	18 PHC clinics	18 Randomized trial, intervention and control group, , ANOVA statistical analyses		6	Strong Included

Mack et al, 2015	Kenya	among newly diagnosed HIV and TB positive patients Identify HR challenges to integrating HIV PrEP in to public health system in Kenya	16 public health stakeholders	Qualitative study Semi structured Interviews	Increased work load, insufficient, HIV care and treatment most overburden staff, pool of trainers, facility based trainings, continuous education and training and mentorship Poor infrastructure : space, furniture, lab equipment's, storage , discrimination and stigma	8	Strong Included
Mahomed et al, 2015	South Africa	Establishment of structural clinical record as guide for chronic disease management to improve the quality of clinical records at PHC	30 PHC ICDM initiating clinics ,6 months study 20 PHC clinics 10 intervention sites and 10 control sites stratified random sampling	Quasi comparison experimental study clinical document review. pre (PC 101 on-site training) and post intervention, HIV patients on ART and NCDs 19 records per single lot structured data collection tool piloted	PC 101 has the potential for improving the quality of clinical records for patients with chronic disease in PHC clinics	9	Strong Included
Makhado and Davhana-Maselesele, 2016	South Africa	To determine knowledge, insight and uptake of occupational post exposure prophylaxis amongst nurses caring for PLWH	233 nurses (ENA, EN/PN	Quantitative Cross sectional descriptive design, stratified sampling, parametric and non-parametric statistics, Questionnaire, SPSS21	Nurses are highly exposed to HIV but still lack knowledge on PEP , not sure if the service is available in their facilities and did not receive PEP and to be address in policy , guidelines and programmes	9	Strong Included
Maphutego et al, 2015	South Africa		ENs=1/PNs=33/ Drs=1	Exploratory descriptive qualitative Design. FGDs, questionnaires	Inadequate training on NIMART, Poor integration of services and support , poor infrastructure and , long waiting hours , staff negative attitudes, poor organization of work schedules and processes	7	Strong Included
Mbonye et al, 2016	South Africa	Determine effectiveness of educational outreach in infectious disease management	36 health facilities , mid-level practitioners 9 clinical officers, RNs or midwives	Cluster Randomized intervention (training and onsite support, CQI) -control study , pre and post changes , mixed design medical records	Improved management of cases and performance of indicators with combination of OSS and training however workload was not address	8	Strong Included

Ndubuka et al, 2016	South Africa	Not indicated	participated on 3 weeks training 4 ART clinics, 104 adult ART patients for 12 months who has stopped taking ARVs for 3 months	review/ audit , secondary data analysis capture in EPI info version 3.2, Ms Excel frequency cross sectional quantitative and , explorative , questionnaires translated in local language, descriptive statistic	Inadequate social and environmental support structures, stigma, poor financial resources , physical living conditions and insecurity lead to poor adherence and defaulting ART	8	Strong Included
Nyasulu et al, 2013	South Africa	Impact of decentralization of NIMART rollout on the referral hospital by applying ten steps	17 PHC facilities	Quasi experimental design, interrupted time series analysis, Compare ART before -2009 and after 2010 From DHIS 2012 Intervention: 5 days training, pre and post-test, mentoring Statistical analysis, auto correlation (Durbin-Watson statistic), excel	45 PNs trained & mentored Increased ART uptake by average of 9 monthly in PHC clinics. referral facilities initiations decreases by average of 18 monthly Inc. workload, however capacity building , training, mentoring and integration was still lacking to ensure quality, partner driven , lacks DoH buy in	9	Strong Included
Nyasulu et al, 2013	South Africa	Impact of decentralization of NIMART rollout on the referral hospital by applying ten steps	17 PHC facilities	Quasi experimental design, interrupted time series analysis, Compare ART before -2009 and after 2010 From DHIS 2012 Intervention: 5 days training, pre and post-test, mentoring Statistical analysis, auto correlation (Durbin-Watson statistic), excel	45 PNs trained & mentored Increased ART uptake by average of 9 monthly in PHC clinics. referral facilities initiations decreases by average of 18 monthly Inc. workload, however capacity building , training, mentoring and integration was still lacking to ensure quality, partner driven , lacks DoH buy in	9	Strong Included
Oladele et al, 2017	Nigeria	Assessment to build to up evidence and provide baseline to Accelerate scaling up of PMTCT services in order to eliminate new paediatric HIV infections	Multiple stakeholders: health ministry, DG, project managers, AIDS coordinators, Dir. PHC , regulatory bodies 4176	Mixed methods 10 months project Qual-Opinions of health care workers , Key informant interviews Quant- Checklist /questionnaire ,descriptive statistics	Roll out model: onsite training of public, NGOs, traditional leaders and healers and private health care workers (7224). Followed by post training two days hands on support by Multi-disciplinary activation teams, deploy resources. Continued fortnight onsite mentoring teams Facility coverage ↑8-50% Access to HCT by	9	Strong Included

Omole et al, 2016	South Africa	To assess the treatment outcomes of an HIV clinic in rural areas	facilities with ANC services from 8 states(private and public)	Retrospective cohort study 124 Medical files review systematic random sampling Data collection tool, pilot study, EPI info version 6, STATA version 9.0 descriptive analysis	pregnant woman 246%Access to ART 152%	6	Strong Included
Ousman et al, 2016	USA	Recruit and train African partnering institutions to provide leadership training on HIV programme 2012-2017 sponsored by PEPFAR, HRSA, OAR from USA	100 inter health care professionals leaders form public, private and academic institutions (43 nurses, 56 physicians, PH 2, Pharmacists , 1) 86 from Africa (Botswana, Kenya, Uganda, Tanzania, Cameroon, countries and 14 USA	Programme development and evaluation Transformative and innovative leadership and HSS training conducted. Participant feedback and direct observation, journal entries, skills log books signed by attached mentor used to assess trainees Biannual survey of the impact of the programme through alumni Self-report , competency based assessment and E of ,indicators attach to each programme	Teaching and learning strategies have been introduced, modified and enhanced to strengthen the training experience e.g. more interactive learning , shift from didactic PowerPoint slides presentation to seminar , case based and reflective learning through sharing of work place experiences work, collaborative learning groups used to dissect, and analyse solutions to complex systems issues, challenges and barriers to health care Faculties assign HIV management modules to provide diverse perspective on the Basic and advance learning modules developed Serviced based learning to improve health care professionals and administrative personnel in improving healthcare systems and HIV care delivery Building capacity to African nursing and medical schools including international council of nurses	8	Strong Included
Owens and Mcronev, 2015	Australia	To determine which three different intervention would assist student	182 high school students 44 underperforming students	Comparative study of performance and entry mark to the course Prior nursing bioscience learning , human	Good high school science did improve student performance unlike prior learning workshop Student centred learning improved performance , however human	8	Strong Included

Relf et al, 2011	USA	performance in a nursing bioscience	Support HIV prevention , care and treatment through training and HSS in response to the epidemic	Educators, clinicians, policy regulatory and experts from sub Saharan Africa	body club and online self-learn smart on bioscience SPSS Participatory action approach	body club was most effective as it provided additional support The need for competency based education, orientation and continuing competency validation as part of license renewal which include knowledge (mental & cognitive abilities), skills (motor abilities) and attitudes (use of cognitive learning ,critical thinking and make appropriate decisions)These competencies should be used to redesign nursing and midwifery curriculum to provide a holistic perspective of HIV and AIDS nursing practice	6	Excluded because it was published before 2012
Shneider,et al, 2014	South Africa	Determine the impact of alcohol on HIV prevention and treatment	Literature with alcohol risk factors ,	Narrative review of relevant literature ,AUDIT tool with ten questions to identify severity of the problem use in PHC	Heavy chronic alcohol consumption alters physiological and biological functioning of the body cell , risky sex , drug interaction and immune system and undermines adherence Nurses need training to provide guidance on the drug interaction and confront barriers	Number of literature, sources and inclusion criteria was not indicated	6	

Annexure E: Focus Group Discussion Guide

Research facilitator's welcoming remarks, introduction and instructions to participants

Welcoming remarks: Thank you for volunteering to take part in this focus group discussion (FGDs). You have been asked to participate voluntarily and have a right to withdraw at any time of the study. Feel free and relaxed to participate as your point of view is important to contribute to nursing education, training and practice body of knowledge. I realize you are busy and I appreciate your time dedicated to participate in the study.

Introduction: This FGDs is designed to explore your challenges regarding the implementation of NIMART training in your facilities in order to make recommendations to relevant stakeholders for improvement of the patients and HIV programme outcomes, if accepted. The FGDs will take no more than two hours. I will use the tape recorder as indicated in the information leaflet attached to the consent form to facilitate its recollection and if you still agree, I will switch it on.

Anonymity: Despite being taped, I would like to assure you that the discussion will be anonymous. The tapes will be kept safely in a locked facility until they are transcribed word for word, then they will be destroyed. The transcribed notes of the FGDs will contain no information that would allow individual subjects to be linked to specific statements. You should try to answer and comment as accurately and truthfully as possible. I and the other focus group participants would appreciate it if you would refrain from discussing the comments of other group members outside the focus group. If there are any questions or discussions that you do not wish to answer or participate in, you do not have to do so; however please try to answer and be as involved as possible. The final manuscript of the study will be made available

to all of you and will be published to an accredited relevant journal without your names or facility names.

Ground rules

- The most important rule is that only one person speaks at a time. There may be a temptation to jump in when someone is talking but please wait until they have finished.
- There are no right or wrong answers
- You do not have to speak in any particular order
- When you do have something to say, please do so. There are many of you in the group and it is important that I obtain the views of each of you
- You do not have to agree with the views of other people in the group
- Does anyone have any questions? (Answers).
- OK, let's begin

Warm up

- First, I'd like everyone to complete the participants demographic data questionnaire without indicating your name or facility names for the researcher to have a better understanding of the participants
- Secondly, introduce yourselves. But not being part of the recording

Introductory question

I am just going to give you some few minutes to reflect on the impact of NIMART training on HIV management in your facilities and challenges influencing NIMART training implementation. Is anyone ready to share his or her experience?

Probing questions

- Share with us your experience during NIMART training, do the training strategies use effective enough to bridges the gap between theory and practice?
- How does the mentoring process improve your competencies?
- How do you get to know if there are amended policies and guidelines?
- Could you outline the support level received post training with reference to your area of practice (facility, local health area, sub district, district and provincial) level?

Concluding question

- Of all the things we've discussed today, what do you think can be done to improve NIMART training implementation?

Conclusion

- Thank you for participating. This has been a very successful discussion
- Your opinions will be a valuable asset to the study
- We hope you have found the discussion interesting
- If there is anything you are unhappy with or wish to complain about, please speak to me later or contact me using the contact numbers provided.
- I would like to remind you that any comments featuring in this report will be anonymous
- Before you leave, please hand in your completed personal details questionnaire

Please, write your report based on the results of the focus group. Please remember to maintain confidentiality of the participating individuals by not disclosing their names.

Annexure F: Trascript

Participants	Follow up question	Responses
NO		
1	Impact of NIMART	at my facility I have observed positive results after training, especially with regard to compliance, because i attend NIMART training we have so many loss to follow, and then, as for maybe I did not understand how to counsel the patient correctly and properly, I have seen that the issue of counselling is very much important, I emphasize the important, the other one is contraindications with other drugs was taken seriously. I understood Retonavir /Letonavir contra indications with diabetic medication, increasing of dosage, i did understand before attending NIMART but now I know, some patient who are HIV/TB infection default treatment, they work in farms and do not come back or tell the staff that they are going to look for a job, sometimes you take sputum for G-XPECT when the results come out , and want to call there is cell number or wrong, there is nobody to trace, and some stay far away from the clinic, only to find that they came back after two months,
	Mentoring	very helpful, during training I did not understand clinical stationery but after mentoring I know to, During training it was not done,
	Support	we only receive support from Aurum
	Facilitators/strategies	to me it was a very short time of training, It was too much information, it was too much, because we also has to do PALS plus, or PC 101, but when I go back to the clinic I usually refer to the guidelines and training materials ,
	Challenges	Long waiting times, as you have to counsel the patient, especially those who have not accepted their status or have not disclose they need more counselling ,you find that we spent a lot of time with those co infected and then, others will be complaining outside , banging the doors, saying 'eeei' you have been long in there come out., so waiting times, we are short staff
	Mentoring	I had no mentor after training, in my facility no , may be in another shift, I use to call some people I know from Aurum to help me,

		I only receive support from partners
	Facilitator/strategies	To be honest, with me for the first time, I was struggling with names , asking myself what is NVP, Tenofovir, how it looks like , they never show us this drugs in class, I only understand when the mentor comes in, showing me that when we talk of NVP we mean this rather done during training,
	Peads	Children are growing , they are taking treatment but not adjusted and affect their condition, some change the facility where they taking ART to somewhere else
2	Impact of NIMART	In my facility after NIMART training we understood HIV better than before, why should we take bloods, I knew what to do if the patient 's viral load is still high while on treatment, so I think even the life of patients is better and improved ,
	Challenges	In my clinic we are short staff , even you try to redress time and again, patients are patients , they tell you about their rights, some will understand that you are alone and even tell others but others will not others I found mentoring very much helpful especially clinical stationery was very complicated for me , the mentor will come and check what I have done and correct me where I am wrong
	Support	it is only Aurum that supported us
	Facilitator/strategies	it was just a facilitation like at school, somebody talking, from there we have to go and initiate
	Peads	Peads with HIV are few and not use to the guidelines, clinical stationery also very difficult , treatment not adjusted in each visits, treating them like adults ,
3	Impact of NIMART	In my facility the impact was both negative and positive, negative In a way that we now have too much workload , TB /HIV Programme , managing two programmes, TB is a programme on its own , you find that we have to manage all these other programmes together with TB/HIV and takes time , but at the other hand we manage to treat patient in one place , clients are able access even family planning unlike being sent to another consultation room strive to do everything together , manage TB/HIV together and patients find it very useful and are very happy, they able to manage HIV better.

Challenges	There is time where I'm alone neeh, no staff nurse , no assistant nurse , taking vital signs, consulting , examining , then come a patient, to be initiated , may be both TB and ART and you need to counsel, it challenge really, then sometimes ,sometimes I'm on leave , my manager attended something , then a staff nurse or assistant nurse is left without a professional nurse, They will tell the patient to come next week or call the nearby clinic and ask if they can allocate on prof Nurse in our facility, so the patient will be told to come next week while he needs treatment now	
Mentoring	it is very helpful to pick up where you were lacking, may be in skills, my mentor was always there, and assist me to put together the POE, she took me step by step until I reach a point where ,I am competent so it is helpful.	
Updates	we receive information late, sometimes when attending another workshop , you hear them talking about something that should have been implemented two months ago e.g. Do you remember that time of ,exposed babies given NVP for a long time instead of 6 weeks or after two weeks of stopping B/F, but we implement as we go on after receiving the information	
Facilitators/strategies	me was too short , I came on Tuesday , but the facilitator was so good, even if when my understanding was not so much , I manage to catch up, After training we went to the hospital to observe , and enables me to catch up,	
Peads	I am much competent in adults , but in children we fail to adjust the dosage, Positive children are very rare due to PMTCT programme , very few are initiated , so it's not something we do every day, Cotrimazole is mostly not given,	
4	Impact of NIMART	in my facility after NIMART training I had a lot of challenges , because from training I was placed in maternity , I did not practice or initiate patients on ART, In 2015 I was changed to another 5 days clinic , so they was a bit of challenges but the other sisters/ colleagues there help me , do PC 101. and managed to initiated the co -infected , do the PCR and management , Even though there was a lot of unsuppressed viral loads, due to defaulters because patients go to work without reporting to the facility, also mothers who default and decide to fall pregnant and then , there a lot of challenges where I am working , TB is increasing in 2017 a lot of Gen- expert positive results, those not positive initiated on IPT, we

are trying to cope but aaaaah, those working in the farms do not come back , i initiate today and disappear after giving treatment for one months but do not come back, There are other factors , the clinic is too small, packed , we tried to help TB or coughing patients first, so that they do not infect others ,

Challenges

the challenges that I can say , HIV patients after counselling neeh and gave them treatment after that they most of them go to the sangoma (Traditional healer), while you have told them of the side effects of ART , Seems they do not believe us , I do not know may it their culture, They will say they see things and stop treatment , while you have told them to expect it , they defaulted and later come with complications , some with cancer , we are going back no progress mentoring so much helpful , and my facility the mentor came fortnightly, when they come they want to see the file , results and audit, very helpful, we also contact a doctor from Aurum,

Updates

sometimes when imp attending a meeting or workshop at sub district office , they will give us a heap of documents including updated guidelines , we need to read on our own and if we do not find time to read , we continue to implement wrong things ,

Peads

The mothers bring the child when is very sick , they will be giving a child enema or traditional medicine

Facilitators/strategies

training for ART initiation I found it helpful and facilitators made the training interesting , I did start immediately but I have to go through the guidelines, to be sure of want I was doing but as time goes on I became competent, the strategies they use makes it to be interesting

5

Impact of NIMART

In our facility even so it not so good but at least we know where are going somewhere, in PMTCT we usually find that per year only one baby being HIV positive, we are able to manage those pregnant woman and we have learn a lot on how to take care of a pregnant women , and in a week an Aurum nurse come twice a week to help us and guide us , moreover we are having guidelines ,Talking about TB/HIV patients the indicator is good and bad because of defaulting , They do not told us when they find the job somewhere , we also have the challenges of VL they do not come as expected , Most of them will get a job at the farms, and never come back, if ask to use

services , they said the clinic is far away from the farm, so when they knock off they just go to shacks and sleep without treatment.

	Challenges Mentoring	our patient are always moving from one area to other very helped and assisted me in adult clinical stationery, to comply ,I had challenge on peads stationery but they take their time to take me through , on how to initiate especially peads
	Updates	I received updates from others who attended training and from Aurum nurses visiting the facilities,
	Facilitators/strategies	after training I could not start on my own, I could see that I was lacking , they gives us too much work , sometimes I had to read on my own, I keep on referring and referring , after sometimes is then that I manage to do it on my own
	Peads	The reason for peads initiated in hospital , they are tested positive but they are refer to hospital due to severe malnutrition or pneumonia,
6	Impact of NIMART	in the facility where are working , we do have patient on ART and some are reactive and sputum positive but very difficult to trace the patient, no transport to take you to the address, sometimes you try but find that is a wrong address, village very far, or trace form the farmer but boss will say they do not know her, I am staying near the border , patients who consulted are from consulted and the starter pack we are using in SA does not work there , difficult to find the patient, sometimes they do not go through the border they just jump the fence,
	Mentoring	helps us lot especially on stationery as it come after when we were trained on NIMART , especially peads stationery ,assisted us in implementation and interpretation, we struggling as some were using adult stationery in peads and it is translated,
	Updates	in my facility , mentors from Aurum come and in-service us, I received changes on taking PCR at birth late, I heard it from counsellors after attending mentor to mother workshop that the guideline has change, I always read and refer to guidelines to implement new changes
	Facilitators/strategies	the training time was very short Too much information, in the facility when coming back was having shortage of staff, then, I did not start, I was allocated somewhere, The mentor was there for me

		but coming after a long time and not helpful to me, disappeared but i tried , I ask other nurses and we assisted each other that how i started, I'm better now , very much better in initiation and children
	Peads	It started on pregnancy , when they are pregnant ,they came late may be at 24 weeks , 28, 32 wks.' , you have to rush getting them tested and other bloods, present late , some give birth at home and come late and the child will done PCR late, the other thing , I lack the skill to collect bloods for VL to a 10 months old baby, Blood collection is a bit of a challenge to me ,the information and guidelines is there , even TB in children , Doing gastric lavage is much of the challenge, Eeeish . IT NOT Practical waitis , ke bulela nete fela , Training is done practical, sometimes the mother did not take the child for X-ray in hospital, Or they have to come for results the mother will take you she will not be able to come,
7	Impact of NIMART	after UTT its more work , all patients even those on PRE ART need to be initiated, and some are running away after being started on treatment and we are having a lot of defaulters, it seems like most of them are started treatment when they are not ready, my skills have changed after training , VL are supressing , problem is defaulter
	Strategies	hmmm, I felt confident to management the patient than before , because I use to rely on doctors , I can change treatment , switch treatment, without the help of the doctor
	Updates	updated guidelines are sometimes brought by programme coordinator , but they do not explain , I just have to read on my own
	Mentoring	I had a mentor and I'm also a facility mentor, I'm good
	Peads	nurses had problem of taking bloods of the child from my facility ,and refer to hospital, nurses are scared or refer to one nurse who can do it better , but we are improving even initiation, Our PCR positive we are initiating them
	Challenges	Defaulting by patients, more defaulters. Eeeish. This is biggest problems
8	Impact	I have seen a lot of improvement in wellness, even from the doctors site they feel like patients must start at wellness and after recommending treatment , I initiate easily, rather patient going straight to OPD , some of the doctors are not good in the management of HIV, more defaulters , patient move to other areas

	and when you trace they will say I am taking in another clinic, there is no system to trace if the patient is taking somewhere else , so they move from one facility to other and being recorded as first initiation, a system to link patient, they act as they have never taken treatment.
Facilitators /strategies	NIMART for me I can say it bridges the gap between theory and practice, firstly I was in maternity I was less interested , I just give Truvada and AZT but with no know and prescribed by the doctor, but after training is then that my eyes were open, to understand the management , side effect of each drug, it did help a lot, I had a mentor by my side , two visits per week,
Mentoring	
Support	I was supported by a doctor , and wellness OPM , she was also my mentor
Updates	I am always surprise when there is a support visit for ideal clinic, they will ask for a NDoH guidelines that we do not have, and they do not Aurum guideline s, I wonder why, They said we must not use them, They differ with national, The first change I knew it through a workshop, these days those who attend never gave us the update, I have to read on my own to update myself, to be honest the changes is too much, is too much. The information from Aurum guidelines is not the same with NDOH, most of the things in our clinic some PN are mostly referring peads cases to the nearby hospital , but now it's getting better , it might be competence, even testing from 6 years , we found that they are reactive and we initiate them,
Peads	
Challenges	yaah challenges are there , we have shortage of NIMART nurses, currently I'm the only one in wellness, mentoring the one who is recently trained , others are allocated in wards were they are not hands on , patients are delayed initiated as they are waiting for me when I am off or on leave, defaulters, tracing and linking system
Support	Aurum mentors, All PN trained , OPM , My manager was already trained so lean on her for support
Updates	I google TB/HIV on new guidelines , I liaise with RTC to check if there is anything new

Annexure G: Certificate for Language editing



NORTH-WEST UNIVERSITY
YUNIBESITHI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
MAFIKENG CAMPUS

Private Bag X2046, Mmabatho
South Africa, 2735

Tel: +2718 389-2451
Cell: 0729116800
Web: <http://www.nwu.ac.za>

School of Teacher Education and Training
Tel: +2718 389 2451
Cell: 0729116800
Email: 22055215@nwu.ac.za

6th December, 2017

TO WHOM IT MAY CONCERN

CERTIFICATE OF LANGUAGE EDITING

I, Muchativugwa Liberty Hove, confirm and certify that I have read and edited the entire thesis **Conceptual Framework for Strengthening Nurse-Initiated Management of ART Training and Implementation in North West Province** by **Sheillah Hlamalani Mboweni** Student Number: **27764400**, submitted in fulfilment of the requirements for the degree **Doctor of Philosophy in Nursing (PhD Nursing)**, Faculty of Agriculture Science and Technology, **North-West University (NWU), Mafikeng Campus**.

Sheillah Hlamalani was supervised by **Professor Lufuno Makhado** of the North-West University. I hold a PhD in English Language and Literature in English and am qualified to edit academic work of such nature for cohesion and coherence.

The views and research procedures detailed and expressed in the thesis remain those of the researcher/s.

Yours sincerely

Dr M.L.Hove

Original details: Dr M.L.Hove (22055215) C:\Users\22055215\Desktop\CERTIFICATE OF EDITING 6th Decembe, 2017

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