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

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Supervisor/Promoter: Prof L Makhado

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Student number: 27764400
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
DECLARATION

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  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:

_______________________________  09 April 2018
Prof L Makhado (Promoter)  Date
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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.
TABLE OF CONTENTS

THESIS OUTLINE .................................................................................................. ii

DECLARARTION ................................................................................................ iii

ACKNOWLEDGEMENTS ....................................................................................... iv

ABSTRACT ............................................................................................................. v

LIST OF ACRONYMS AND ABBREVIATIONS ...................................................... xii

LIST OF TABLES ................................................................................................... xiv

SECTION 1: ............................................................................................................. 1

1. INTRODUCTION AND BACKGROUND ......................................................... 1

2. PROBLEM STATEMENT ................................................................................... 10

3. PURPOSE AND OBJECTIVES OF THE STUDY ............................................. 12

3.1. Purpose of the study .................................................................................. 12

3.1.1 Objectives of the study .......................................................................... 12

4. SIGNIFICANCE OF THE STUDY .................................................................. 12

5. DEFINITION OF CONCEPTS ......................................................................... 13

6. CENTRAL THEORETICAL STATEMENT: CONCEPTUAL MODEL ............... 15

Fig 1: Donadedian’s structure – process-outcomes Model (SOP) ....................... 15

7. THE STUDY PARADIGMATIC PERSPECTIVE .............................................. 17

7.1. Ontological assumptions .......................................................................... 18

7.2. Epistemological assumptions ................................................................... 18

7.3. Methodological assumptions .................................................................... 18

8. METHODOLOGY: RESEARCH DESIGN AND METHODS ......................... 19

8.1. Research strategy: Mixed method ............................................................. 19
8.2. PHASE I: QUANTITATIVE METHODS

8.2.1 Quantitative design: Descriptive programme evaluation

8.2.2 Study setting

8.2.3 Population

8.2.4 Sample selection and size

8.2.5 Quantitative data collection instrument

8.2.6 Quantitative data analysis

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

8.3. PHASE 2: QUALITATIVE METHODS

8.3.1 Qualitative design: Programme evaluation

8.3.2 Population

8.3.3 Sample selection and size

8.3.4 Data collection method: Focus group Discussions

8.3.5 Data collection instrument

8.3.6 Qualitative data analysis

8.4 PHASE 3: META-INFERENCE AND CONCEPTUAL FRAMEWORK

9. TRUSTWORTHINESS IN QUALITATIVE RESEARCH

10. ETHICAL CONSIDERATIONS OF THE STUDY

11. THESIS OUTLINE

REFERENCES

Appendix A

Journal Author Guidelines for Manuscript One: Curationis

Structure and style of your empirical research article
1. Introduction and Background .......................................................... 207
2. Methods .......................................................................................... 209
3. Results ............................................................................................ 214
4. Conceptual framework: NIMART training implementation .............. 223
5. Discussion ....................................................................................... 230
6. Conclusion ....................................................................................... 231
References ........................................................................................ 233

SECTION THREE .................................................................................. 239

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS .............. 239

INTRODUCTION .................................................................................. 239

CONCLUSIONS .................................................................................... 239

Conclusion: Manuscripts one: Comprehensive literature review: NIMART training and implementation ........................................................................................................... 240

Conclusion: Manuscript two: The impact of NIMART training on HIV management .......................................................... 240

Conclusion: Manuscript three: Challenges regarding implementation of NIMART training ........................................................................................................... 241

Conclusion: Manuscript four: Conceptual framework for strengthening Nurse- Initiated Management of ART Training and Implementation in North West Province .......................................................... 242

General conclusion ............................................................................. 243

LIMITATIONS OF THE STUDY ............................................................ 243

RECOMMENDATIONS .......................................................................... 244

SUMMARY ............................................................................................ 247

Annexure A: Ethical Clearence ............................................................... 249
### LIST OF ACRONYMS AND ABBREVIATIONS

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

1. Fig 1: Conceptual Framework
2. Fig 2: Quan- Qual Sequential Mixed Method Strategy
3. Fig 3: Flow of information through the different phases of the Systematic Reviews
4. Fig 4: TROA for adult & children in NMM district selected CHCs, Jan 12 – Dec 16
5. Fig 5: TROA for adult & children in NMM district selected Clinics, Jan 12 – Dec 16
6. Fig 6: Children under 15 yrs. ART initiation naïve Vs. TROA in NMM District selected CHCs Jan 12 – Dec 16
7. Fig 7: ANC pregnant women eligible on ART Vs. Those initiated on ART Jan 12- Dec 16 in NMM PHC selected Clinics
8. Fig 8: ANC pregnant women eligible on ART Vs. Those initiated on ART Jan 12- Dec 16 in NMM PHC Selected Clinics
9. Fig 9: Quarterly % of adults LTFU after 12 months started on ART in NMM District
10. Fig 10: Adults VLC & VLS rate at 12 months from Jan 12 – Jan15 in NMM District
11. Fig 11: % Adults died after 12mths started on ART Jan 12 –Oct 15 in NMM District
12. Fig 12: Agent of the CF
13. Fig 13: Recipient of the CF
14. Fig 14: Context enabling implementation
15. Fig 15: Dynamics of the CF
16. Fig 16: Guiding principle
17. Fig 17: Terminus or outcome

18. Fig 18: Conceptual framework for strengthening nurse-initiated Management of art training and implementation
LIST OF TABLES

Table 1: Search terms

Table 2: Data bases and search results identifying the original studies

Table 3: Inclusion criteria according to PICOs review protocol

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

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

Table 6: NMM district NIMART skills audit report

Table 7: HIV testing vs. ART initiation in NMM district CHCs

Table 8: HIV testing vs. ART initiation in NMM district clinics

Table 9: Challenges influencing NIMART training implementation

Table 10: Measures ensure trustworthiness

Table 10: Research designs and methods for the development of the CF
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 is 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
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 increases 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 NWPDHoH, 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 effectives 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.
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 NWPDHo 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.
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.

![Explanatory sequential mixed method and Conceptual Framework Development flow diagram](image)

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 NWPDH 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;
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 (Friese, 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


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 eThekwini 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 five year strategic plans. 2015-2016-2019/2020. Mahikeng, South Africa


Section Two: Manuscripts
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.

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### 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 interchangeable 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 exit. 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 (EBCO), scholar Google, ProQuest, academic journals, SA publications, electronic resources and OAISTERS. 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

<table>
<thead>
<tr>
<th>Search key words</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIMART OR HIV training AND HIV management</td>
<td>1</td>
</tr>
<tr>
<td>Impact of NIMART OR HIV training</td>
<td>2</td>
</tr>
<tr>
<td>Training and HIV programme performance</td>
<td>3</td>
</tr>
<tr>
<td>Combination</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
</tr>
</tbody>
</table>

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

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

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

*After duplications removed*
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

<table>
<thead>
<tr>
<th>Theme1: Positive strategies impacting on NIMART/HIV training</th>
<th>Use of Interactive teaching strategies to stimulate critical thinking which include problem based, reflective, case studies and seminars.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Use of competency-based education and training</td>
</tr>
<tr>
<td></td>
<td>Onsite training on PC 101 training improves recording and integration of NCDs with HIV</td>
</tr>
<tr>
<td></td>
<td>Onsite continuous facility training on current development and gaps.</td>
</tr>
<tr>
<td></td>
<td>Continuous professional development and onsite facility mentoring</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Theme 2: Negative strategies impacting on NIMART/HIV training</th>
<th>Ineffective training methods which include the use of traditional didactics like lecture methods and slides presentation have no impact on learning and implementation.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A lack of pre-service NIMART training in institutions of higher learning makes students lack skills to manage HIV.</td>
</tr>
<tr>
<td></td>
<td>Inadequate clinical onsite mentoring, partner driven only.</td>
</tr>
<tr>
<td></td>
<td>Inadequate in-service training on current developments</td>
</tr>
<tr>
<td></td>
<td>A lack of continuous professional development (CPD) to improve knowledge and skills.</td>
</tr>
<tr>
<td></td>
<td>Inadequate and unskilled trainers</td>
</tr>
<tr>
<td></td>
<td>Inadequate training period (5 days).</td>
</tr>
<tr>
<td></td>
<td>Unintegrated training curriculum in pre- or service training and education</td>
</tr>
<tr>
<td></td>
<td>Inadequate training on data management, elements definition, clinical registers or stationery.</td>
</tr>
<tr>
<td></td>
<td>Inadequate training &amp; implementation of PC 101.</td>
</tr>
</tbody>
</table>

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 & Semenya. 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

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

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**


Friese


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*


Appendix B

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


• Qualitative studies - COREQ - Consolidated criteria for reporting qualitative research, http://www.equator-network.org/reporting-guidelines/coreq


• Randomised (and quasi-randomised) controlled trial - CONSORT - Consolidated Standards of Reporting Trials, http://www.equator-network.org/reporting-
guidelines/consort/


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 trialshttp://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.*

Authors are required to obtain written permission from the copyright owner of the instrument to reproduce it, and ensure that it is credited appropriately and the correct copyright line qualifying the permission to use/translate the instrument is supplied underneath the submitted scale. If authors want to retain copyright of their own scale they can do so and indicate that it is reproduced with their permission.

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 ICJME requirements can be found
at http://www.icmje.org/ and the COPE’s guidelines

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.

For information on Ethics in Publishing and Ethical guidelines for journal publication see http://www.elsevier.com/authorethics and http://www.elsevier.com/ethicalguidelines.

**Informed consent and patient details**

Studies on patients or volunteers require ethics committee approval and informed consent, which should be documented in the paper. Appropriate consents, permissions and releases must be obtained where an author wishes to include case details or other personal information or images of patients and any other individuals in an Elsevier publication. Written consents must be retained by the author and copies of the consents or evidence that such consents have been obtained must be provided to Elsevier on request. For more information, please review the Elsevier Policy on the Use of Images or Personal Information of Patients or other Individuals. Unless you have written permission from the patient (or, where applicable, the next of kin), the personal details of any patient included in any part of the article and in
any supplementary materials (including all illustrations and videos) must be removed before submission.

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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.

<table>
<thead>
<tr>
<th>Sub district</th>
<th>Sub site</th>
<th>Facilities</th>
<th>Total No of PNs in the facility</th>
<th>PNs trained on NIMART</th>
<th>PN not trained on NIMART</th>
<th>PNs Initiating ART</th>
<th>PN not certificated for competency on NIMART</th>
<th>PN s Not certificated on NIMART</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>U</td>
<td>CHC 1</td>
<td>17</td>
<td>13(76%)</td>
<td>4(23.5%)</td>
<td>13</td>
<td>9</td>
<td>4(30.7%)</td>
</tr>
<tr>
<td>.</td>
<td>R</td>
<td>Clinic 1</td>
<td>13</td>
<td>10 (77%)</td>
<td>3(23%)</td>
<td>10</td>
<td>7</td>
<td>3(30%)</td>
</tr>
<tr>
<td>2</td>
<td>R</td>
<td>CHC 2</td>
<td>15</td>
<td>14(93%)</td>
<td>1(6.6%)</td>
<td>14</td>
<td>11</td>
<td>3(21.4%)</td>
</tr>
<tr>
<td>3</td>
<td>R</td>
<td>Clinic 2</td>
<td>2</td>
<td>2(100%)</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2(100%)</td>
</tr>
<tr>
<td>3</td>
<td>SU</td>
<td>CHC 3</td>
<td>12</td>
<td>9(75%)</td>
<td>3(25%)</td>
<td>9</td>
<td>3</td>
<td>6(66.6%)</td>
</tr>
<tr>
<td>4</td>
<td>R</td>
<td>Clinic 3</td>
<td>4</td>
<td>3(75%)</td>
<td>1 (25%)</td>
<td>3</td>
<td>0</td>
<td>3(100%)</td>
</tr>
<tr>
<td>4</td>
<td>SU</td>
<td>CHC 4</td>
<td>8</td>
<td>6(75%)</td>
<td>2(25%)</td>
<td>6</td>
<td>5</td>
<td>1(16.6%)</td>
</tr>
<tr>
<td>5</td>
<td>R</td>
<td>Clinic 4</td>
<td>2</td>
<td>2(100%)</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1(50%)</td>
</tr>
<tr>
<td>5</td>
<td>SU</td>
<td>CHC 5</td>
<td>17</td>
<td>10(58.8%)</td>
<td>7(41%)</td>
<td>10</td>
<td>4</td>
<td>6(60%)</td>
</tr>
<tr>
<td>5</td>
<td>R</td>
<td>Clinic 5</td>
<td>1</td>
<td>1(100%)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1(100%)</td>
</tr>
</tbody>
</table>

| 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

127
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.

<table>
<thead>
<tr>
<th></th>
<th>Jan-Dec 12</th>
<th>Jan-Dec 13</th>
<th>Jan-Dec 14</th>
<th>Jan-Dec 15</th>
<th>Jan-Dec 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinic 1</td>
<td>35</td>
<td>17</td>
<td>29</td>
<td>27</td>
<td>32</td>
</tr>
<tr>
<td>Clinic 2</td>
<td>41</td>
<td>19</td>
<td>42</td>
<td>45</td>
<td>40</td>
</tr>
<tr>
<td>Clinic 3</td>
<td>32</td>
<td>35</td>
<td>23</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Clinic 4</td>
<td>37</td>
<td>44</td>
<td>40</td>
<td>45</td>
<td>47</td>
</tr>
<tr>
<td>Clinic 5</td>
<td>210</td>
<td>209</td>
<td>146</td>
<td>136</td>
<td>146</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Sub-district</th>
<th>Facilities</th>
<th>HTS all ages</th>
<th>Jan-Dec 12</th>
<th>Jan-Dec 13</th>
<th>Jan-Dec 14</th>
<th>Jan-Dec 15</th>
<th>Jan-Dec 16</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CHC 1</td>
<td>HIV Tested</td>
<td>3 177</td>
<td>3 765</td>
<td>4 122</td>
<td>4 723</td>
<td>4 589</td>
<td>20 376</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HIV +ve</td>
<td>419</td>
<td>392</td>
<td>449</td>
<td>399</td>
<td>359</td>
<td>2 018</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Initiated</td>
<td>259</td>
<td>250</td>
<td>326</td>
<td>221</td>
<td>258</td>
<td>1 314</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yield</td>
<td>13</td>
<td>10</td>
<td>11</td>
<td>8</td>
<td>8</td>
<td>51</td>
</tr>
<tr>
<td>2</td>
<td>CHC 2</td>
<td>HIV tested</td>
<td>1 111</td>
<td>1 673</td>
<td>1 723</td>
<td>1 803</td>
<td>2 211</td>
<td>8 521</td>
</tr>
<tr>
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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

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Source: DHIS & 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.

![Figure 7: Quarterly % of adults LTFU after 12mths ART from Jan 12 to Oct 2016, NMM district](image)

**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.

![Graph](image)

**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


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


Appendix C

Author Guidelines for Manuscript Three: Health SA Gesondheid Journal
Health SA Gesondheid Author Guidelines

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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

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/ 082 826 3153

Email: 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 NWPDh. 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

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<th>Trustworthiness element</th>
<th>Strategies to enhanced trustworthiness</th>
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<td>Credibility</td>
<td>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</td>
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<td>Dependability</td>
<td>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.</td>
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<tr>
<td>Conformability</td>
<td>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</td>
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Conduction pilot study and another district with NINART trained nurses to help in refining the study methods. An independent co-coder was used and three consecutive discussions followed before consensus was reached.

| 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

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<td>NIMART training Challenges</td>
<td>Poor integration of theory &amp; practice</td>
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<td>Health care system challenges</td>
<td>Patient related challenges</td>
<td>Socio economic status and adherence</td>
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<td>Human resource challenges</td>
<td>Shortage of skilled health care workers</td>
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<td>Staff attitude on HIV management</td>
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<td>Poor data management</td>
<td>Lack of confidence</td>
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<td>Overcrowding</td>
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**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.


“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
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


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

Sheillah Hlamalani Mboweni\textsuperscript{1}, MA and Lufuno Makhado\textsuperscript{1}, PhD

\textsuperscript{1}School of Nursing science, North-West University, Mafikeng Campus, Mmabatho, South Africa

\textsuperscript{1}Address for corresponding author:

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

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 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 entire absence of a conceptual framework or model that guides training and implementation.

Conclusion: The study findings were conceptualised to describe and develop 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’s practice-orientated theory and Donabedian’s SPO model provided a starting point in the ultimate development of the framework.

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

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<td>practice oriented</td>
<td>NIMART Trained PNs</td>
<td>Random &amp; Purposive</td>
<td>Rural NMM</td>
</tr>
<tr>
<td></td>
<td>theory &amp; Donabedian’s SPO model</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 analysed 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.

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

---

Table 1: NIMART training coverage NMM RTC, 2016

<table>
<thead>
<tr>
<th>Subdistrict</th>
<th>Area</th>
<th>Facilities</th>
<th>PNs in the facility</th>
<th>No trained</th>
<th>Not trained</th>
<th>Initiating ART</th>
<th>Certificated</th>
<th>Not certificated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>U</td>
<td>CHC 1</td>
<td>17</td>
<td>13(76%)</td>
<td>4(23.5%)</td>
<td>13</td>
<td>9</td>
<td>4(30.7%)</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>Clinic 1</td>
<td>13</td>
<td>10(77%)</td>
<td>3(23%)</td>
<td>10</td>
<td>7</td>
<td>3(30%)</td>
</tr>
<tr>
<td>2</td>
<td>R</td>
<td>CHC 2</td>
<td>15</td>
<td>14(93%)</td>
<td>1(6.6%)</td>
<td>14</td>
<td>11</td>
<td>3(21.4%)</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>Clinic 2</td>
<td>2</td>
<td>2(100%)</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2(100%)</td>
</tr>
<tr>
<td>3</td>
<td>SU</td>
<td>CHC 3</td>
<td>12</td>
<td>9(75%)</td>
<td>3(25%)</td>
<td>9</td>
<td>3</td>
<td>6(66.6%)</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>Clinic 3</td>
<td>4</td>
<td>3(75%)</td>
<td>1(25%)</td>
<td>3</td>
<td>0</td>
<td>3(100%)</td>
</tr>
<tr>
<td>4</td>
<td>SU</td>
<td>CHC 4</td>
<td>8</td>
<td>6(75%)</td>
<td>2(25%)</td>
<td>6</td>
<td>5</td>
<td>1(16.6%)</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>Clinic 4</td>
<td>2</td>
<td>2(100%)</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>1(50%)</td>
</tr>
<tr>
<td>5</td>
<td>SU</td>
<td>CHC 5</td>
<td>17</td>
<td>10(58.8%)</td>
<td>7(41%)</td>
<td>10</td>
<td>4</td>
<td>6(60%)</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>Clinic 5</td>
<td>1</td>
<td>1(100%)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1(100%)</td>
</tr>
</tbody>
</table>

| 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
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

<table>
<thead>
<tr>
<th>Sub district</th>
<th>Facilities</th>
<th>HTS all ages</th>
<th>Jan-Dec 12</th>
<th>Jan-Dec 13</th>
<th>Jan-Dec 14</th>
<th>Jan-Dec 15</th>
<th>Jan-Dec 16</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 CHC 1</td>
<td>HIV Tested</td>
<td>3 177</td>
<td>3 765</td>
<td>4 122</td>
<td>4 723</td>
<td>4 589</td>
<td>20 376</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HIV +ve</td>
<td>419</td>
<td>392</td>
<td>449</td>
<td>399</td>
<td>359</td>
<td>2018</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Initiated</td>
<td>259</td>
<td>250</td>
<td>326</td>
<td>221</td>
<td>258</td>
<td>1 314</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yield</td>
<td>13</td>
<td>10</td>
<td>11</td>
<td>8</td>
<td>8</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>2 CHC 2</td>
<td>HIV Tested</td>
<td>1 111</td>
<td>1 673</td>
<td>1 723</td>
<td>1 803</td>
<td>2 211</td>
<td>8 521</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HIV +ve</td>
<td>239</td>
<td>263</td>
<td>299</td>
<td>194</td>
<td>201</td>
<td>1 196</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Initiated</td>
<td>187</td>
<td>136</td>
<td>191</td>
<td>96</td>
<td>103</td>
<td>713</td>
<td></td>
</tr>
<tr>
<td></td>
<td>yield</td>
<td>22</td>
<td>16</td>
<td>17</td>
<td>11</td>
<td>9</td>
<td>74</td>
<td></td>
</tr>
<tr>
<td>3 CHC 3</td>
<td>HIV Tested</td>
<td>749</td>
<td>603</td>
<td>849</td>
<td>895</td>
<td>501</td>
<td>3 597</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HIV +ve</td>
<td>219</td>
<td>189</td>
<td>209</td>
<td>192</td>
<td>258</td>
<td>1 067</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Initiated</td>
<td>109</td>
<td>122</td>
<td>127</td>
<td>135</td>
<td>34</td>
<td>527</td>
<td></td>
</tr>
<tr>
<td></td>
<td>yield</td>
<td>29</td>
<td>31</td>
<td>25</td>
<td>21</td>
<td>51</td>
<td>158</td>
<td></td>
</tr>
<tr>
<td>4 CHC 4</td>
<td>HIV Tested</td>
<td>503</td>
<td>488</td>
<td>591</td>
<td>607</td>
<td>678</td>
<td>2 867</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HIV +ve</td>
<td>179</td>
<td>191</td>
<td>122</td>
<td>104</td>
<td>111</td>
<td>707</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Initiated</td>
<td>99</td>
<td>139</td>
<td>92</td>
<td>124</td>
<td>34</td>
<td>488</td>
<td></td>
</tr>
<tr>
<td></td>
<td>yield</td>
<td>36</td>
<td>39</td>
<td>21</td>
<td>17</td>
<td>16</td>
<td>129</td>
<td></td>
</tr>
<tr>
<td>5 CHC 5</td>
<td>HIV Tested</td>
<td>1 122</td>
<td>1 599</td>
<td>1 879</td>
<td>2 088</td>
<td>2 322</td>
<td>9 010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HIV +ve</td>
<td>199</td>
<td>319</td>
<td>352</td>
<td>409</td>
<td>489</td>
<td>1 768</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Initiated</td>
<td>233</td>
<td>248</td>
<td>205</td>
<td>152</td>
<td>212</td>
<td>1 050</td>
<td></td>
</tr>
<tr>
<td></td>
<td>yield</td>
<td>18</td>
<td>20</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>97</td>
<td></td>
</tr>
</tbody>
</table>

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

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

*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

<table>
<thead>
<tr>
<th>Theme</th>
<th>Category</th>
<th>Sub category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. NIMART training challenges</td>
<td>Poor integration of theory &amp; practice</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inadequate facilitation skills</td>
<td></td>
</tr>
<tr>
<td>Lack of training Model or conceptual framework</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of NIMART standardised curriculum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of pre-service training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate in-service training</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Health care system challenges

<table>
<thead>
<tr>
<th>Patient related challenges</th>
<th>Socio economic status and adherence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lack of disclosure</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Human resource challenges</th>
<th>Shortage of skilled health care workers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Staff attitude on HIV management</td>
</tr>
<tr>
<td></td>
<td>Lack of confidence</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poor data management</th>
<th>Poor adherence to data management SOPs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Incomplete clinical records</td>
</tr>
<tr>
<td></td>
<td>Inconsistent clinical records quality audits</td>
</tr>
<tr>
<td></td>
<td>Lack of data verification</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poor infrastructure</th>
<th>Poorly maintained PHC facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overcrowding</td>
</tr>
</tbody>
</table>

| 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 the 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
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**


Ousman. K., Polomano, R.C., Seloiwe, E., Odero, T., Tarmo, E., et al., (2016). Inter professional fellowship training for emerging global health leaders in Africa to


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 aversively 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 form 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 development 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

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.

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.

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 enquires or requests for assistance.

Yours sincerely

Prof LA Du Plessis

Digitally signed by
Prof LA Du Plessis
Date: 2017.10.12
08:58:20 +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 involved, however a minimal psychological discomfort may be experienced during interviews with regard to challenges impacting implementation and will be phrases 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 assigned 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

<table>
<thead>
<tr>
<th>Author and year</th>
<th>Country</th>
<th>Purpose</th>
<th>Participants</th>
<th>Methodology (data collection &amp; analysis)</th>
<th>Key findings</th>
<th>QA</th>
<th>comments</th>
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<td>Azia et al, 2016</td>
<td>South Africa</td>
<td>Describe challenges faced by patients on ART with regard to adherence to treatment</td>
<td>18 non adherence patients on ART</td>
<td>Descriptive qualitative study, purpose sampling, semi structured interview, manual thematic analysis</td>
<td>Inadequate follow-ups, lack of confidentiality Stigma, unemployment, lack of transport, insufficient disability grants were identified as major barriers to adherence</td>
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<td>Strong Included</td>
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<td>Byakika-kibwika et al, 2015</td>
<td>Uganda</td>
<td>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</td>
<td>236 under graduate students, 32 teaching health professionals</td>
<td>Mixed methods designs, Cross sectional study, questionnaires and FGDs and key informant interviews Descriptive</td>
<td>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</td>
<td>8</td>
<td>Strong Included</td>
</tr>
<tr>
<td>Bekker et al, 2016</td>
<td>South Africa</td>
<td>To provide guideline on the use of PrEP (Tenofovir TDF/emtricitabine FTC)to users and health care workers</td>
<td>17000 people from Uganda, Kenya, Botswana</td>
<td>10 random controlled trial on TDF based PrEp reporting HIV outcomes</td>
<td>Reduction of HIV requisition risk by 51% on women and men Development of PrEp guidelines for southern Africa</td>
<td>7</td>
<td>included in references</td>
</tr>
<tr>
<td>Bluestone et al, 2013</td>
<td>USA</td>
<td>To identify effective training approaches for health worker continuing professional education (CPE)</td>
<td>37 full text studies reviewed .32 randomized controlled trials</td>
<td>Programme evaluation, randomized control trial</td>
<td>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</td>
<td>7</td>
<td>Strong Included</td>
</tr>
<tr>
<td>Chew et al, 2012</td>
<td>USA</td>
<td>Development, implementation and</td>
<td>18 second year students</td>
<td>Programme development, description and evaluation</td>
<td>Increase knowledge and confidence in serving the PLWH</td>
<td>8</td>
<td>Strong Included</td>
</tr>
<tr>
<td>Study</td>
<td>Country</td>
<td>Objective</td>
<td>Methods</td>
<td>Results</td>
<td>Strength</td>
<td>Included</td>
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<tr>
<td>Colombini et al 2014</td>
<td>USA</td>
<td>Review evidence on the factors influencing maternal and infant drug adherence to preventing MTCT drug regimens at delivery in Sub-Saharan Africa</td>
<td>Quantitative research designs</td>
<td>Studies reveal the following as factors influencing adherence: Quality and timing of ART, late distribution of NVP, socio-demographic factors</td>
<td>Strong</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td>Crowley and Stelleberg, 2015</td>
<td>South Africa</td>
<td>To evaluate the adequacy of pharmaceutical services for the provision of ART in PHC clinics.</td>
<td>Quantitative descriptive study</td>
<td>Insufficient storage space, inadequate security, poor stockouts 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</td>
<td>Strong</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td>Davies et al, 2013</td>
<td>South Africa</td>
<td>Explore nurses, facility and programme managers perceptions of NIMART implementation</td>
<td>Qualitative, FGD interviews, purposive sampling</td>
<td>Nurses and managers felt empowered by this role despite challenges of shortage of HR, inadequate training, clinical mentoring and health systems issues</td>
<td>Strong</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td>Duncombe et al, 2015</td>
<td>USA</td>
<td>Development of HIV care patient centred framework that will</td>
<td>Systematic literature review</td>
<td>Literature and examples of models and evidence of impact was used to develop a Framework for delivering HIV care and</td>
<td>Included</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>Country</td>
<td>Study Design</td>
<td>Methods</td>
<td>Findings</td>
<td>Strength</td>
<td>Included</td>
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<tr>
<td>Iwu et al, 2014</td>
<td>USA</td>
<td>Literature review</td>
<td>34 literature reviewed</td>
<td>Literature support that nurses in Africa can provide quality HIV care with excellent outcomes through acquisition of knowledge, skills and mentoring</td>
<td>7</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td>Kaposhi et al, 2014</td>
<td>USA</td>
<td>Systematic review</td>
<td>Full text task shifting publications, in depth review</td>
<td>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,</td>
<td>6</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td>Knight et al, 2015</td>
<td>SA</td>
<td>Prospective observational cohort study</td>
<td>Self-report, pill count, electronic medication event monitoring system before and after ART initiation Questionnaire, medical files review analyses</td>
<td>Decreased adherence to treatment in patients with TB/HIV infection and associated with poor outcomes, development of resistance and requires adherence support</td>
<td>8</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td>Kompala et al, 2016</td>
<td>USA</td>
<td>Retrospective study</td>
<td>Local facility for initiation based on eligibility criteria, Chi Square test</td>
<td>7213 access screening services, reduced loss of pre ART care and facilitate timely access to ART. Availability of CD4 phlebotomy may reduce loss</td>
<td>8</td>
<td>included</td>
<td></td>
</tr>
<tr>
<td>Kufa et al, 2014</td>
<td>USA</td>
<td>Randomized trial</td>
<td>Intervention and control group, ANOVA statistical analyses</td>
<td>18 Randomized trial, intervention and control group, ANOVA statistical analyses</td>
<td>6</td>
<td>Included</td>
<td></td>
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<tr>
<td>Authors</td>
<td>Country</td>
<td>Objective</td>
<td>Methods</td>
<td>Challenges</td>
<td>Strong Included</td>
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<tr>
<td>Mack et al, 2015</td>
<td>Kenya</td>
<td>Identify HR challenges to integrating HIV PrEP in to public health system in Kenya</td>
<td>Qualitative study Semi structured Interviews</td>
<td>Increased work load, insufficient, HIV care and treatment most overburden staff, training for existing and new staff, create pool of trainers, facility based trainings, continuous education and training and mentorship Poor infrastructure: space, furniture, lab equipment’s, storage, discrimination and stigma</td>
<td>8 Strong Included</td>
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</tr>
<tr>
<td>Mahomed et al, 2015</td>
<td>South Africa</td>
<td>Establishment of structural clinical record as guide for chronic disease management to improve the quality of clinical records at PHC</td>
<td>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</td>
<td>PC 101 has the potential for improving the quality of clinical records for patients with chronic disease in PHC clinics</td>
<td>9 Strong Included</td>
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<tr>
<td>Makhado and Davhana-Maselesele, 2016</td>
<td>South Africa</td>
<td>To determine knowledge, insight and uptake of occupational post exposure prophylaxis amongst nurses caring for PLWH</td>
<td>Quantitative Cross sectional descriptive design, stratified sampling, parametric and non-parametric statistics, Questionnaire, SPSS21</td>
<td>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</td>
<td>9 Strong Included</td>
<td></td>
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<tr>
<td>Maphutego et al, 2015</td>
<td>South Africa</td>
<td>Determine effectiveness of educational outreach in infectious disease management</td>
<td>Exploratory descriptive qualitative Design. FGDs, questionnaires</td>
<td>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</td>
<td>7 Strong Included</td>
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<tr>
<td>Mbonye et al, 2016</td>
<td>South Africa</td>
<td>Determine effectiveness of educational outreach in infectious disease management</td>
<td>Cluster Randomized intervention (training and Onsite support, CQI) -control study, pre and post changes, mixed design medical records</td>
<td>Improved management of cases and performance of indicators with combination of OSS and training however workload was not address</td>
<td>8 Strong Included</td>
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<td>Study</td>
<td>Country</td>
<td>Type of support</td>
<td>Type of data</td>
<td>Methods</td>
<td>Outcomes</td>
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<td>Ndubuka et al, 2016</td>
<td>South Africa</td>
<td>Not indicated</td>
<td>cross sectional quantitative and explorative</td>
<td>Quasi experimental design, interrupted time series analysis, Compare ART before -2009 and after 2010 From DHIS 2012</td>
<td>Inadequate social and environmental support structures, stigma, poor financial resources, physical living conditions and insecurity lead to poor adherence and defaulting ART</td>
<td></td>
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<tr>
<td>Nyasulu et al, 2013</td>
<td>South Africa</td>
<td>Impact of decentralization of NIMART rollout on the referral hospital by applying ten steps</td>
<td>cross sectional qualitative and descriptive statistic</td>
<td>Quasi experimental design, interrupted time series analysis, Compare ART before -2009 and after 2010 From DHIS 2012</td>
<td>45 PNs trained &amp; 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</td>
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<tr>
<td>Nyasulu et al, 2013</td>
<td>South Africa</td>
<td>Impact of decentralization of NIMART rollout on the referral hospital by applying ten steps</td>
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<td>Quasi experimental design, interrupted time series analysis, Compare ART before -2009 and after 2010 From DHIS 2012</td>
<td>45 PNs trained &amp; 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</td>
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<tr>
<td>Oladele et al, 2017</td>
<td>Nigeria</td>
<td>Assessment to build up evidence and provide baseline to Accelerate scaling up of PMTCT services in order to eliminate new paediatric HIV infections</td>
<td>Multiple stakeholders: health ministry, DG, project managers, AIDS coordinators, Dir. PHC, regulatory bodies</td>
<td>Mixed methods 10 months project Qual-Opinions of health care workers, Key informant interviews Quant-Checklist/questionnaire, descriptive statistics</td>
<td>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</td>
<td></td>
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<tr>
<td>Name</td>
<td>Country</td>
<td>Description</td>
<td>Facilities with ANC services from 8 states (private and public)</td>
<td>Pregnant woman 246% Access to ART 152%</td>
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<tr>
<td>Omole et al, 2016</td>
<td>South Africa</td>
<td>To assess the treatment outcomes of an HIV clinic in rural areas</td>
<td>2CHC, 18 PHC clinic Adult patients initiated on ART 2007-2008</td>
<td>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</td>
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<td>Good treatment outcomes is achievable in rural HIV clinic in SA however VL and adherence support for pregnant women should be enhanced to reduce MTCT</td>
<td>6 Strong Included</td>
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<tr>
<td>Ousman et al, 2016</td>
<td>USA</td>
<td>Recruit and train African partnering institutions to provide leadership training on HIV management, 5 year programme 2012-2017 sponsored by PEPFAR, HRSA, OAR from USA</td>
<td>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</td>
<td>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</td>
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<td>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</td>
<td>8 Strong Included</td>
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<tr>
<td>Owens and Moroney, 2015</td>
<td>Australia</td>
<td>To determine which three different intervention would assist student</td>
<td>182 high school students 44 underperforming students</td>
<td>Comparative study of performance and entry mark to the course Prior nursing bioscience learning, human</td>
<td></td>
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<tr>
<td></td>
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<td>Good high school science did improve student performance unlike prior learning workshop Student centred learning improved performance, however human</td>
<td>8 Strong Included</td>
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<tr>
<td>Study</td>
<td>Country</td>
<td>Objective</td>
<td>Methods</td>
<td>Findings</td>
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<tr>
<td>Relf et al, 2011</td>
<td>USA</td>
<td>Support HIV prevention, care and treatment through training and HSS in response to the epidemic</td>
<td>Educators, clinicians, policy regulatory and experts from sub Saharan Africa</td>
<td>Participatory action approach. The need for competency based education, orientation and continuing competency validation as part of license renewal which include knowledge (mental &amp; 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</td>
<td></td>
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</tr>
<tr>
<td>Shneider, et al, 2014</td>
<td>South Africa</td>
<td>Determine the impact of alcohol on HIV prevention and treatment</td>
<td>Literature with alcohol risk factors, Narrative review of relevant literature, AUDIT tool with ten questions to identify severity of the problem use in PHC</td>
<td>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</td>
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</table>

6 Excluded because it was published before 2012
6 Number of literature, sources and inclusion criteria was not indicated
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: Transcript

<table>
<thead>
<tr>
<th>Participants NO</th>
<th>Follow up question</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Impact of NIMART</td>
<td>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,</td>
</tr>
<tr>
<td>Mentoring</td>
<td></td>
<td>very helpful, during training I did not understand clinical stationery but after mentoring I know to, During training it was not done,</td>
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<tr>
<td>Support</td>
<td></td>
<td>we only receive support from Aurum</td>
</tr>
<tr>
<td>Facilitators/strategies</td>
<td></td>
<td>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 PALSA plus, or PC 101, but when I go back to the clinic I usually refer to the guidelines and training materials,</td>
</tr>
<tr>
<td>Challenges</td>
<td></td>
<td>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 ‘eeii’ you have been long in there come out, so waiting times, we are short staff</td>
</tr>
<tr>
<td>Mentoring</td>
<td></td>
<td>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,</td>
</tr>
</tbody>
</table>
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, Tenoforvir, 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, 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.

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 month, 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 reach and given 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 be 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.

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 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.

Facilitators/strategies

Training for ART initiation, 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 what I was doing, but as time goes on I became competent. The strategies they use makes it to be interesting.

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 women. We are having guidelines.Talking about TB/HIV we come twice a week to help us and guide us. Moreover, we are able to manage those patients and we have a lot on how to take care of pregnant women, and in a week an Aurum nurse will be giving a child enema or traditional medicine.

In PMTCT we usually find only one baby being HIV positive, we are able to manage those pregnant women. Moreover, we are able to manage those patients and we have guidelines.
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

our patient are always moving from one area to other

Mentoring

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 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, Eeish . IT NOT Practical waitsi , 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. Eeish. 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
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,

Mentoring
it did help a lot, I had a mentor by my side, two visits per week,

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 guidelines, 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

Peads
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,

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

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 Mbweni 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