Conceptual framework for strengthening nurse-initiated management of antiretroviral therapy training and implementation in North West province

Introduction

Human immunodeficiency 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 UNAIDS (2015). The prevalence varies from country to region. The developing and underdeveloped countries and sub-Saharan region are particularly highly affected, compounded by an increasing burden of tuberculosis (TB) (Joint United Nations Programme on HIV/AIDS [UNAIDS] 2015). The Republic of South Africa (RSA) has the largest epidemic in the world, with an estimated 7 million PLWH at a prevalence rate of 19% amongst adults, of which 13% are amongst men sleeping with men (MSM), 30% pregnant women and 1.4% children. Out of 7 million PLWH, only 60% know their HIV status. However, 3.4 million
PLWH can now access antiretroviral therapy (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 that include PLWH. Such figures raise serious concerns (UNAIDS 2016). In addition, one-fourth of deaths reported in the RSA are because of HIV-related illnesses and TB has been identified as the leading cause at 8.4% of natural deaths (UNAIDS 2016). World Health Organization’s (WHO) task shifting was implemented for nurses to initiate ART in order to meet this increasing demand for ART since 2009 (WHO 2007). Other policy strategies like 90–90–90 were developed and nurses working in the primary health care (PHC) setting were capacitated to improve the management and control the HIV and TB epidemics (UNAIDS 2014b). Despite these measures, quality health is still a challenge as measured by patient outcomes. This is confirmed by low rates of viral load (VL) suppression, high loss to follow-up (LTFU) and fluctuating numbers of total patients remaining on ART (TROA). In addition, ART initiation amongst HIV-positive antenatal care (ANC) pregnant women, children and TB or 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 nurse-initiated management of ART (NIMART) (North West Province Department of Health, 2015–2016). The healthcare system in the North West province 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 (HRs)and budget to patient factors. All these need to be dealt with decisively (Byakika-Kibwika et al. 2015; Davies, Homfray & Venables 2013; Kaposhi, Mqoqi & Schnopflocker 2014; 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 could 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 NIMART. According to Lekhuleni, Kgole and Mbombi (2015), student nurses still lack knowledge and confidence to implement, monitor and evaluate HIV programmes. Furthermore, it was identified that both training and mentoring are partner-driven. Therefore, in this article, the researchers aimed to develop and describe a conceptual framework (CF) that could strengthen NIMART training and implementation to improve patient and HIV programme outcomes in the North West province. A model that characteristically supports the CF should guide effective training and implementation. In this article, the Dickoff, James and Wiedenbach’s (1968) practice-oriented theory and Donabedian’s (1966) structure, process and outcome (SPO) model formed the basis for the development of the CF.

The main objective of this study was to develop and describe a CF for strengthening NIMART training and implementation in the North West province.

### Research methods and design

A mixed-methods paradigm was chosen using a sequential, explanatory, mixed-methods design 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 CF. This included a comprehensive systematic literature review, quantitative programme evaluation and an exploratory descriptive qualitative study.

The CF was crafted based on the findings of QUAN-qual initial studies. Dickoff et al.’s (1968) practice-oriented theory and Donabedian’s (1966) SPO model were used simultaneously to classify and categorise the characteristics, activities and functions of the NIMART training and the implementation of the HIV programme within PHC facilities. There is a symbiotic relationship between Dickoff et al.’s practice-orientated theory and Donabedian’s SPO model. The two therefore provided a starting point for the development of the CF. 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).

Furthermore, exhaustiveness and mutual exclusiveness were used as criteria to select the most appropriate characteristics best describing the phenomenon 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). Again, further refinement was performed to eliminate overlapping activities (Table 1).

Stratified sampling was used to randomly select PHC facilities from the predominantly rural Ngaka Modiri Molema (NMM) district of the North West province and purposive sampling was used to select NIMART-trained nurses and programme managers directly involved in the management of the TB and HIV programme.

Quantitative data were collected from a secondary source, which includes the District Health Information System (DHIS) and three integrated information electronic registers (Tier.net), from January 2012 to December 2016. The following variables were measured: facility information (facility type,
TABLE 1: Research designs and method preceding the development of conceptual framework.

| Stage | Design | Population | Sampling | Sample size | Context |
|-------|--------|------------|----------|-------------|---------|
| Phase 1 | Systematic literature review | All full text articles | Multimodal | 33 | - |
| Phase 2 | Descriptive programme evaluation | All NMM district PHC facilities | Simple stratified random | ART Statistics from 10 PHC facilities (five CHCs and five clinics) | Rural NMM |
| Phase 3 | Exploratory descriptive | All NMM NIMART-trained PNs | Non-probability purposive | 28 | Rural NMM |
| Phase 4 | Dickoff et al.’s (1968) practice-oriented theory and Donabedian’s (1966) SPQ model | PHC facilities (clinics and CHCs) NIMART-trained PNs | Simple stratified random and purposive | 10 PHC facilities and 28 NIMART PNs | Rural NMM |

NIMART, nurse-initiated management of antiretroviral therapy; NMM, Ngaka Modiri Molema; PHC, primary healthcare; CHC, community health centre; PN, professional nurse; SPQ, structure, process and outcome.

TABLE 2: Nurse-initiated management of antiretroviral therapy training coverage in Ngaka Modiri Molema Regional Training Centre, 2016.

| Sub-district | Area | Facilities | PNs in the facility | Trained | Not trained | Initiating ART | Certified | Not certified |
|-------------|------|------------|---------------------|---------|------------|---------------|----------|--------------|
|             | 1    | U CHC 1    | 17                  | 13      | 76.0       | 4             | 23.5     | 13           | 9            | 9           | 4           | 30.7       |
|             |      | R Clinic 1 | 13                  | 10      | 77.0       | 3             | 23.0     | 10           | 0            | 7           | 0           | 3          | 30.0       |
|             | 2    | R CHC 2    | 15                  | 14      | 93.0       | 1             | 6.6      | 14           | 0            | 11          | 0           | 3          | 21.4       |
|             |      | R Clinic 2 | 2                   | 2       | 100.0      | 0             | -        | 2            | 0            | 0           | 0           | 0          | 100.0      |
|             |      | SU CHC 3   | 12                  | 9       | 75.0       | 3             | 25.0     | 9            | 0            | 3           | 0           | 3          | 66.6       |
|             |      | R Clinic 3 | 3                   | 3       | 75.0       | 1             | 25.0     | 3            | 0            | 0           | 0           | 0          | 100.0      |
|             | 3    | SU CHC 4   | 8                   | 6       | 75.0       | 2             | 25.0     | 6            | 0            | 5           | 0           | 1          | 16.6       |
|             |      | R Clinic 4 | 2                   | 2       | 100.0      | 0             | -        | 2            | 0            | 1           | 0           | 1          | 50.0       |
|             |      | SU CHC 5   | 17                  | 10      | 58.8       | 7             | 41.0     | 10           | 0            | 4           | 0           | 0          | 60.0       |
|             |      | R Clinic 5 | 1                   | 1       | 100.0      | 0             | -        | 1            | 0           | 0           | 0           | 0          | 100.0      |
|             |      | Total      | 91                  | 70      | 76.9       | 21            | 23.0     | 70           | 100.0        | 40          | 57.1        | 30          | 42.8       |

Source: Skills audit report, Mboweni, S.H. & Makhado, L., 2019, ‘Impact of NIMART training on HIV management in Ngaka Modiri Molema District, North WEST province’, International Journal of Africa Nursing Sciences 11, 100170

R, rural; SU, semi-urban; U, urban; ART, antiretroviral therapy; CHC, community health centre; PN, professional nurse.

data from DHIS were extracted as pivot tables into Excel spreadsheet, analysed and presented quantitatively in tables and graphs using descriptive statistics. Atlas.ti software was used to analyse the qualitative data supported by the basic steps of descriptive analysis to analyse qualitative data: coding, analysis and description (Friese 2012). The researcher read and re-read the transcribed data until themes emerged. Themes were then grouped into codes according to the similarity and later classified into categories.

Trustworthiness of the study findings was enhanced using mixed-methods design, validating data with participants and keeping all tape-recorded data and notes safe for future reference. The researcher also spent enough time with participants until data saturation, which made possible to scrutinise and amplify the data. An initial pilot study facilitated the development and refinement of study methods.

Ethical consideration

The study received approval from the Ethics and Research Committee of the North-West University (approval number: NWU-00607-17-A9) and permission was granted by the NW Department of Health. Voluntary, written informed consent was obtained from all the participants and they were informed of their rights to withdraw from the study at any time. The data collected were recorded after permission was granted and were kept safe and locked. Privacy, anonymity and confidentiality in all procedures were maintained in the spirit of ethical conduct.

Results

Meta-inference and interpretation of the quantitative and qualitative results were conducted to supplement the quantitative findings, and these are presented in the following:

Nurse-initiated management of antiretroviral therapy training coverage in the primary health care facilities and antiretroviral therapy intake constraints

The NIMART training coverage is herein referred to as the total number of professional nurses trained in NIMART out of the total number of professional nurses in that facility. The quantitative findings revealed that all PHC clinics from rural, urban and semi-urban areas (100%) are within the set coverage target of 75% and only one Community Health Centre (CHC) from a semi-urban area (58.8%) is below the
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 tended to transfer patients who tested positive to another facility or book them for another day. One NIMART nurse stated that ‘I 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 [of Health]’ (P13, FGD3, female) and another nurse indicated that ‘I was so disappointed and frustrated at the same time for failing to help the client’ (emotional, raising the voice) (P8, FGD2, male). 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, especially amongst children and ANC pregnant women, despite the introduction of the prevention of mother-to-child transmission (PMTCT) policy in 2013 (National Department of Health 2014) and universal test and treat in September 2016 (National Department of Health 2016) (Tables 2 and 3). These policies specifically direct that all patients who are HIV-positive, including pregnant women, should be initiated on ART without considering the Cluster of Differentiation 4 cell count.

This was found to be closely linked to the qualitative results (Table 5), 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 also evidence that inadequate in-service training on updated guidelines, poor compliance to guidelines, lack of confidence, especially to manage children and TB and HIV co-infected patients, and poor linkage to care within the facility only serve to exacerbate the situation with regard to PLWH. In addition, NIMART nurses revealed that data quality and management are 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.

The study further revealed that patients contribute to the low ART initiation, as facilities lose them before they are initiated. Linkage of HIV-positive clients to treatment is far below the target of 90% and this has a negative impact on the achievement of the ambitious target of 90–90–90 strategy by 2020. It was revealed that patients still suffer from stigma and discrimination and do not disclose their status to their partners and families. 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.

The study findings revealed several challenges influencing NIMART implementation (Table 4). Nurse-initiated management of antiretroviral therapy-trained nurses reported that the healthcare organisation negatively influenced the implementation of NIMART training. Furthermore, they revealed that the PHC infrastructure was not well maintained and the facilities were also too small to cater for the increasing number of patients who wished to access PHC, including HIV services. Consequently, this could expose both staff and patients to cross-infection because of overcrowding.

### TABLE 3: HIV testing versus antiretroviral therapy initiation in Ngaka Modiri Molema district primary health care and community health centre.

| Sub-district | Facilities | HTS all ages | January – December 2012 | January – December 2013 | January – December 2014 | January – December 2015 | January – December 2016 | Total |
|--------------|------------|-------------|-------------------------|------------------------|------------------------|------------------------|------------------------|-------|
|              |            | n           | %                       | n                      | %                      | n                      | %                      |       |
| 1            | CHC 1      | HIV tested  | 3177                    | 3765                   | 4122                   | 4723                   | 4589                   | 20 376|
|              |            | HIV +ve     | 419                     | 392                    | 449                    | 399                    | 359                    | 20 198|
|              |            | Total initiated | 259                 | 250                    | 326                    | 221                    | 258                    | 1314 68|
|              |            | Yield       | 13                      | 10                     | 11                     | 8                      | 8                      | 51    |
| 2            | CHC 2      | HIV tested  | 1111                    | 1673                   | 1723                   | 1803                   | 2211                   | 8521  |
|              |            | HIV +ve     | 239                     | 263                    | 299                    | 194                    | 201                    | 1196  |
|              |            | Total initiated | 187                 | 136                    | 191                    | 96                     | 103                    | 713 60|
|              |            | Yield       | 22                      | 16                     | 17                     | 11                     | 9                      | 74    |
| 3            | CHC 3      | HIV tested  | 749                     | 603                    | 849                    | 895                    | 501                    | 3597  |
|              |            | HIV +ve     | 219                     | 189                    | 209                    | 192                    | 258                    | 1067  |
|              |            | Total initiated | 109                 | 122                    | 127                    | 135                    | 34                     | 527 49|
|              |            | Yield       | 29                      | 31                     | 25                     | 21                     | 51                     | 158    |
| 4            | CHC 4      | HIV tested  | 503                     | 488                    | 591                    | 607                    | 678                    | 2867  |
|              |            | HIV +ve     | 179                     | 191                    | 122                    | 104                    | 111                    | 707    |
|              |            | Total initiated | 99                   | 139                    | 92                     | 124                    | 34                     | 488 69|
|              |            | Yield       | 36                      | 39                     | 21                     | 17                     | 16                     | 129    |
| 5            | CHC 5      | HIV tested  | 1122                    | 1599                   | 1879                   | 2088                   | 2322                   | 9010  |
|              |            | HIV +ve     | 199                     | 319                    | 352                    | 409                    | 489                    | 1768  |
|              |            | Total initiated | 233                 | 248                    | 205                    | 152                    | 212                    | 1050 59|
|              |            | Yield       | 18                      | 20                     | 19                     | 20                     | 21                     | 97    |

Source: Skills audit report, Mboweni, S.H. & Makhado, L., 2019, ‘Impact of NIMART training on HIV management in Ngaka Modiri Molema District, North WEST province’, International Journal of Africa Nursing Sciences 11, 100170
*ve, positive; HIV, human immunodeficiency virus; HTS, HIV Testing Services; CHC, Community Health Centre.*
1.1.1. Poor integration of theory and practice

1.2. Lack of involvement of training, education and practice stakeholder in NIMART training and implementation

1.2.1. Lack of involvement of quality assurance bodies, nursing colleges and universities

1.2.2. Lack of pre-service training

1.3. Inadequate continued development

1.3.1. Inadequate continuous in-service

1.4. Lack of training model or conceptual framework

1.4.1. Lack of guidance to NIMART training and implementation

2.1. Patient-related challenges

2.1.1. Socio-economic status and adherence

2.1.2. Lack of disclosure

2.2. Human resource challenges

2.2.1. Shortage of skilled healthcare workers

2.2.2. Staff attitude regarding HIV management

2.2.3. Poor adherence to data management SOPs

2.2.4. Lack of data verification

2.2.5. Incomplete clinical records

2.2.6. Inconsistent clinical records quality audits

2.3. Service delivery challenges

2.3.1. Overcrowding

2.3.2. Lack of district mentoring strategy

2.3.3. Lack of support systems from management

2.3.4. Poor compliance to policies and guidelines

TABLE 4: HIV testing versus antiretroviral therapy initiation in Ngaka Modiri Molema District Community Health Centre and Physical Healthcare Clinics.

| Sub-district | Facilities | HTS all ages | January – December 2012 | January – December 2013 | January – December 2014 | January – December 2015 | January – December 2016 | Total | n % |
|--------------|------------|--------------|-------------------------|------------------------|------------------------|------------------------|------------------------|-------|-----|
| Clinic 1     | HIV tested | 289          | 292                     | 282                    | 345                    | 339                    | 1547                   | 1167  | 2013 |
| HIV +ve      | 51         | 35           | 47                      | 38                     | 47                     | 47                     | 218                    | 1585  | -   |
| Total initiated | 35        | 17           | 29                      | 27                     | 32                     | 32                     | 140                    | 64    |     |
| yield in %   | 18         | 12           | 17                      | 11                     | 14                     | 14                     | 71                     | -     |     |
| Clinic 2     | HIV tested | 399          | 273                     | 297                    | 304                    | 312                    | 1585                   | 1172  | 2014 |
| HIV +ve      | 59         | 55           | 53                      | 59                     | 49                     | 49                     | 275                    | -     |     |
| Total initiated | 41        | 19           | 42                      | 45                     | 40                     | 40                     | 187                    | 68    |     |
| yield in %   | 15         | 20           | 18                      | 19                     | 16                     | 16                     | 88                     | -     |     |
| Clinic 3     | HIV tested | 117          | 121                     | 133                    | 191                    | 189                    | 751                    | 133   | 2015 |
| HIV +ve      | 47         | 43           | 37                      | 29                     | 34                     | 34                     | 190                    | -     |     |
| Total initiated | 32        | 35           | 23                      | 8                      | 0                      | 0                      | 98                     | 51    |     |
| yield in %   | 40         | 36           | 28                      | 15                     | 18                     | 18                     | 137                    | -     |     |
| Clinic 4     | HIV tested | 300          | 297                     | 201                    | 199                    | 320                    | 1317                   | 1167  | 2016 |
| HIV +ve      | 65         | 46           | 71                      | 66                     | 88                     | 88                     | 336                    | -     |     |
| Total initiated | 37        | 44           | 40                      | 45                     | 47                     | 47                     | 213                    | 63    |     |
| yield in %   | 22         | 15           | 35                      | 35                     | 28                     | 28                     | 133                    | -     |     |
| Clinic 5     | HIV tested | 1167         | 1357                    | 1978                   | 1859                   | 1972                   | 8333                   | 1167  | 2017 |
| HIV +ve      | 304        | 340          | 297                     | 202                    | 301                    | 301                    | 1444                   | -     |     |
| Total initiated | 210       | 209          | 146                     | 136                    | 146                    | 146                    | 847                    | 59    |     |
| yield in %   | 26         | 25           | 15                      | 11                     | 15                     | 15                     | 92                     | -     |     |

HIV, human immunodeficiency virus; HTS, HIV testing services; CHC, community health centre.

TABLE 5: Thematic analysis of challenges influencing nurse-initiated management of antiretroviral therapy training and implementation.

| Number | Theme | Categories | Subcategories |
|--------|-------|------------|---------------|
| 1      | NIMART training | 1.1. Lack of NIMART-standardised curriculum | 1.1.1. Poor integration of theory and practice |
|        |        | 1.2. Lack of involvement of training, education and practice | 1.2.1. Lack of involvement of quality assurance bodies, nursing colleges and universities |
|        |        | stakeholder in NIMART training and implementation | 1.2.2. Lack of pre-service training |
|        |        | 1.3. Inadequate continued development | 1.3.1. Inadequate continuous in-service |
|        |        | 1.4. Lack of training model or conceptual framework | 1.4.1. Lack of guidance to NIMART training and implementation |
| 2      | Healthcare system | 2.1. Patient-related challenges | 2.1.1. Socio-economic status and adherence |
|        |        | 2.1.2. Lack of disclosure | 2.1.2. Lack of disclosure |
|        |        | 2.2. Human resource challenges | 2.2.1. Shortage of skilled healthcare workers |
|        |        | 2.2.2. Staff attitude regarding HIV management | 2.2.2. Staff attitude regarding HIV management |
|        |        | 2.2.3. Poor adherence to data management SOPs | 2.2.3. Poor adherence to data management SOPs |
|        |        | 2.2.4. Lack of data verification | 2.2.4. Lack of data verification |
|        |        | 2.2.5. Incomplete clinical records | 2.2.5. Incomplete clinical records |
|        |        | 2.2.6. Inconsistent clinical records quality audits | 2.2.6. Inconsistent clinical records quality audits |
|        |        | 2.4. Poor infrastructure | 2.4.1. Poorly maintained PHC facilities |
|        |        | 2.4.2. Overcrowding | 2.4.2. Overcrowding |
|        |        | 2.5.1. Lack of district mentoring strategy | 2.5.1. Lack of district mentoring strategy |
|        |        | 2.5.2. Lack of support systems from management | 2.5.2. Lack of support systems from management |
|        |        | 2.5.3. Poor compliance to policies and guidelines | 2.5.3. Poor compliance to policies and guidelines |

NIMART, nurse-initiated management of antiretroviral therapy; PHC, physical healthcare; HIV, human immunodeficiency virus; SOP, structure, process and outcome.

Some patients were reported to wait outside and felt uncomfortable when they had to wait for long times before they were attended to. The study revealed that there is a critical shortage of skilled HRs and experienced nurses are resigning. In addition, NIMART nurses revealed that the Department of Health always argued that budget constraints were the main reason why vacancies were not filled. This was also highlighted through the reported high staff turnover, especially amongst skilled NIMART nurses. The remaining NIMART nurses and programme managers reported that they are overworked, and this puts them under severe pressure. Because the NIMART-trained nurses are stressed, some display negative attitudes towards the HIV programme and PLWH. These also contribute to poor compliance to guidelines and patients having to wait for long hours for care, while some are left unattended. Both NIMART nurses and programme managers revealed that there is no support, coaching and supervision from management and the absence of all these demoralises them (Table 5).

**Nurse-initiated management of antiretroviral therapy training challenges**

In addition to the healthcare 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 are partner-driven and there are 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, the reports indicate that patients are transferred to another PHC facility or hospital. These factors were reported to frustrate community service nurses and weaken linkages to healthcare. 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 thus result in poor learning outcomes. The study revealed that NIMART training is not recognised or registered with the regulatory bodies like South African Nursing Council (SANC) or health and welfare sector education and training authority (HWSETA) for quality and is not regarded as part of continuous professional development (CPD) to keep nurses and lecturers updated on HIV management.

Additional tracer indicators to monitor quality of antiretroviral therapy management

Figures 1 and 2 illustrate analyses of monitoring of VL completion, viral suppression and LTFU rate from Tier.net to obtain a clearer picture of the impact of NIMART training on patients receiving ART.

Instability of total patients remaining on antiretroviral therapy: Poor adherence and retention to care

The quantitative results revealed fluid and fluctuating patterns in TROA. This was also confirmed by the fluctuation in adults’ LTFU after 12 months of starting ART at an average of 14% and low ART initiation amongst patients who tested positive or eligible for ART (Tables 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 healthcare system challenges.

Poor monitoring of treatment outcomes

The study revealed that even though access to ART has increased, the quality of HIV services for PLWH is unsatisfactory. This is evident in the poor monitoring of VL rate at 12 months after starting ART, which is at an average of 54% low and viral suppression at 56%, which is far below the target of 90%. This confirms the qualitative results that NIMART nurses are not compliant to guidelines despite training.

Conceptual framework to strengthen nurse-initiated management of antiretroviral therapy training and implementation

The CF was developed based on Dickoff et al.’s (1968) practice-oriented theory and Donabedian’s (1966) SPO model. Both Dickoff et al.’s practice-oriented theory and Donabedian’s SPO model enabled the researcher to identify and incorporate the different features so that these coalesce to provide the emerging phases 1–3 results, and eventually a CF. The development of CF is described next.

Expected persons to implement the nurse-initiated management of antiretroviral therapy training conceptual framework (the agent)

According to Dickoff et al. (1968), an agent refers to a person or thing that implements the framework. According to Donabedian’s (1966) SPO model, this refers to the structure that enables the implementation of the CF, including the recipient and the context. In this study, the national, provincial...
Prioritising the PHC in budget planning is necessary to deal with the overt challenges influencing implementation. Provincial and district management team support, flexibility, coaching and supervision are all necessary to influence and facilitate discipline and meaningful implementation.

The support system to improve nurse-initiated management of antiretroviral therapy implementation (dynamics)

Dynamics refer to the sources of power or energy amongst the activities (Dickoff et al. 1968). According to Donabedian (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 influence and facilitate implementation. Intrinsic and extrinsic recognition is necessary to motivate and enhance the 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 great influence on successful implementation.

The guiding procedure or rule (principle or process)

Guiding principle refers to the rule, technique, protocol and routine governing the activities to achieve the terminus (Dickoff et al. 1968). It is evident from the study results that quality training, mentoring, support and compliance to policies, guidelines, SOPs and 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 and success to arrive at the terminus. Another principle to facilitate and influence implementation is involvement of all internal and external stakeholders, which includes district clinical specialist teams (DCSTs), facilitators, RTC managers and the province and district leadership developmental partners, HEI, SANC and HWSETA in implementation.

The outcome of implementation of nurse-initiated management of antiretroviral therapy training conceptual framework (terminus)

Terminus refers to the outcomes or results of an activity (Dickoff et al. 1968). Donabedian (1966) describes a terminus as the 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 facilitate the production of confident, competent and skilled NIMART nurses, who are compliant to policies and guidelines. This will facilitate the improvement of patient health status by increasing linkages to ART, improving adherence and retention to care, low LTFU, viral suppression and decanting of stable patients and relieving pressure on NIMART nurses.
Furthermore, this facilitates the reduction of death rate and increases life expectancy.

Dickoff et al.’s (1968) six survey list and Donabedian’s (1966) SPO model were categorised and classified with the characteristics and activities from the study findings to develop a CF that can facilitate and influence improvement of NIMART training and implementation in the North West province (NW) district health system, thus improving the outcomes (Figure 3).

**Discussion**

The purpose of this study was to conceptualise the study findings to develop and describe a CF that could provide guidance and strengthen NIMART training and implementation to improve patient and HIV programme outcomes in the North West province. The CF was developed based on Dickoff et al.’s (1968) practice-oriented theory and Donabedian’s (1966) SPO model. The study found that even though access to ART has increased, ART initiation versus HIV-positive patients is low, especially amongst children and ANC (pregnant) women and poses a risk of mother to child transmission, while nurses are trained on NMART. Abuogi, Smith and McFarland (2016) opined that failure to initiate or retain children on ART leads to early mortality. According to Van der Walt, Lancaster and Shean (2016), Anigilaje et al. (2016) and Teklu et al. (2017), early ART initiation reduces transmission of HIV infection, death and incidences of TB. Deconinck et al. (2015) and Adedinsewo et al. (2014) also confirmed 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) confirmed that poor linkage of HIV-positive patients to care results in early LTFU and delayed ART initiation. Grimsrud et al. (2015) stated that reorganisation of the ART programme and a proper down referral system could reduce LTFU. The universal test and treat policy should be implemented to improve patient outcomes and achieve the ambitious 90–90–90 targets (UNAIDS 2014).

Monitoring of patients 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 regimens (Cope et al. 2015; Wilhelmson et al. 2016). Life expectancy of PLWH could be improved if LTFU is considered seriously (Patterson et al. 2015). It is evident from the study results that NIMART nurses still lack confidence and competence because of the level of NIMART training and mentoring received, which along with the organisational factors influence implementation (Davies et al. 2013; Mack et al. 2015; Mbone et al. 2016; Nyasulu et al. 2013; Oladele et al. 2017; Owens & Moroney 2015). It is also evident from the study findings that these barriers should be dealt with decisively to improve outcomes. De La Mata et al. (2017) stated that facility resources contribute to implementation and reduction of LTFU. Nurse-initiated management of antiretroviral therapy nurses did not comply with guidelines and compromised the quality of management provided. It was from these issues that the need originated to develop a CF to strengthen NIMART training and implementation in the North West province.

Conclusion

Nurse-initiated management of antiretroviral therapy training has significant impact on HIV management as it has resulted in the expansion of the ART programme and increased access to ART services at the PHC level in the North West province.

However, the quality regarding HIV care and management is still a challenge even though PNs are trained on NIMART. It is evident from the study findings that various factors such as healthcare system, patients and training outcomes influence the implementation of NIMART training. The developed CF has the potential to strengthen NIMART training and implementation, thereby promoting positive HIV management outcomes.

Limitations of the study

This 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 CF in the province or even in South Africa.

Practical implications of the study

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

Acknowledgements

The authors thank all professional nurses and facilities for their participation in this study. They also thank the North-West University for the support offered towards this study.

Competing interests

The authors declared that they have no financial and personal relationship(s) that may have inappropriately influenced them in writing article.

Authors’ contributions

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

Funding information

This study was funded by the National Research Foundation (NRF) (Thuthuka grant- TTK160601167061).

Data availability statement

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Disclaimer

The views and the opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

References

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

Adediranwo, D.A., Wei, S.C., Robertson, M., Rose, C., Johnson, C.H., Dombrowski, J. et al., 2014, ‘Timing of antiretroviral therapy initiation in a nationally representative sample of HIV-infected adults receiving medical care in the United States’, AIDS Patient Care and STDs 28(12), 613–621. https://doi.org/10.1089/apc.2014.0194

Anigilaje, E.A., Adenbughe, S.A., Adeoti, A.O. & Nweke, N.O., 2015, ‘Tuberculosis, before and after antiretroviral therapy HIV-infected children in Nigeria: What are the risk factors?’, PLoS One 11(5), 1–19. https://doi.org/10.1371/journal.pone.0156177

Byakika-Kibwika, P., Kutesa, A., Baingana, R., Muhumuza, C., Kitutu, F.E., Mwaresigwa, L. et al., 2015, ‘A situation analysis of inter-professional education and practice for ethics and professionalism training at Makerere University College of Health Sciences’, BMC Research Notes 8(1), 598. https://doi.org/10.1186/s13104-015-1577-y

Cope, R., Pickering, A., Glowa, T., Faulds, S., Veldkamp, P. & Prasad, R., 2015, ‘Majority of HIV/HCV patients need to switch antiretroviral therapy to accommodate direct acting antivirals’, AIDS Patient Care and STDs 29(7), 379–383. https://doi.org/10.1089/apc.2015.0004

Creswell, J.W., 2009, Research design. A quantitative, qualitative and mixed method approaches, 3rd edn., Sage, Los Angeles, CA.

Davies, N., Homfray, M. & Venables, E.C., 2013, ‘Nurse and manager perception of nurse-initiated and managed antiretroviral therapy (NIMART) implementation in South Africa: A qualitative study’, BMC Open 2013(3), 1–9. https://doi.org/10.1186/bmjoopen-2013-003840

Deconinck, L., Yazdanpanah, Y., Gilson, R.J., Melliez, H., Viger, N., Joly, V. et al., 2015; Time to initiation of antiretroviral therapy in HIV-infected patients diagnosed with an opportunistic disease: A cohort study, British HIV Association 2016(16), 219–229. https://doi.org/10.1111/hiv.12201
