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Factors facilitating trained NIMART nurses' adherence to treatment guidelines: A vital matter in the management of TB/HIV treatment in South Africa

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Abstract

Background: Globally, the burden of tuberculosis or human immunodeficiency virus (TB/HIV) is at 24% and this alarming rate compelled the World Health Organization (WHO) to declare the African region as a critical workforce shortage area. To facilitate adherence to treatment guidelines, WHO recommended a strategy of task shifting for countries with high health workforce shortages. The strategy aimed at the redistribution of health care tasks to available workers. The purpose of this study was to determine factors facilitating trained nurse-initiated management of antiretroviral therapy (NIMART) adherence to TB/HIV treatment guidelines in KwaZulu-Natal (KZN) and North West (NW) Provinces of South Africa.

Design: The study was qualitative, exploratory-descriptive in nature. The population comprised of 24 participants who were purposively selected. The in-depth focus group discussions were conducted and data analysis was through ATLAS T.I. software program (version 7.0). This followed the basic steps of notice-collect-think (NCT) analysis. Trustworthiness and adherence to ethics were ensured.

Results: The singular theme of factors facilitating trained NIMART nurses' adherence to treatment guidelines which included positive attitudinal needs and positive behavioural change emerged from raw data.

Conclusion: Continuous training, support supervision and improved relationships with colleagues need to be enhanced to enable NIMART nurses to adhere to treatment guidelines.

Background

Globally, the disease burden of tuberculosis (TB)/ human immunodeficiency virus (HIV) is at 24%, with a 3% global health workforce that compelled the World Health Organization (WHO) to declare the African region as a critical workforce shortage area [1]. To facilitate adherence to treatment guidelines, WHO recommended a strategy of task-shifting for countries with high health workforce shortages [2, 3, 4]. The task-shifting strategy aimed at the redistribution of health care tasks to health care practitioners that are available. With severe shortages of physicians and the increasing burden of TB/HIV co-infection and pandemic, there was an increased demand for access and adherence to antiretroviral treatment (ART) [5]. This initiated the shifting of ART initiation and management from physicians to nurses. There has been a lot of evidence about the growing shifting of these ART tasks to nurses in African countries, but little is known about the impact of implementing this model and adherence to treatment guidelines on nurses on the African continent [6].

Task shifting is an old phenomenon; in France and China substitutes for physicians has been a practice as far back as the 19^{th} century [7]. In African countries, training of non-physician nurses was done for different roles with good health outcomes although there are critics who suggest that task shifting performed uncritically at the expense of health workers often leads to low salary, poor working conditions and high attrition [8]. A concern was therefore raised that shifting additional HIV tasks to lower health workers categories could risk competing with other service priorities, especially the adherence to

treatment guidelines [8]. The World Health Organization (WHO) published recommendations to promote the initiation of ART for all persons with TB/HIV co-infection, irrespective of the CD4 cell count [9].

Management of TB/HIV relies on the proper implementation of guidelines by NIMART trained nurses. Precise and systematic implementation of treatment guidelines is critically important if the TB/HIV treatment outcomes are to be realised. Implementation of ART initiation was undertaken at different points of time in South Africa. Before 2009, South Africa's treatment guidelines reserved initiation of antiretroviral therapy (ART) for adults with CD4 counts < 200/mm^3 [10]. In 2010, the revised guidelines outlined eligibility for ART among persons with TB/HIV to include those with CD4 cell count 350 cells/mm^3 and those with multidrug-resistant or extensively drug-resistant TB (MDR-TB or XDR-TB), irrespective of CD4 cell count [11]. Appropriate case management of TB, including the provision of comprehensive HIV care to the co-infected patient, is therefore important in prolonging the lives of people living with HIV (PLWH), minimising the negative effects of TB on the course of HIV, and interrupting the transmission of TB.

The National Department of Health developed the National Strategic Plan for HIV, STIs and TB 2017–2022 to respond to the dual epidemics [12, 13]. The focus of this study is on HIV and TB, and professional nurses (PN) training on NIMART programme to provide comprehensive TB/HIV management. Since adherence to treatment is a key determinant of TB/HIV treatment outcomes, the use of facilitators in the implementation of guidelines should be promoted [14]. The evidence highlights that nurses generally display a more positive attitude when implementing clinical practice guidelines as compared to physicians ($p < 0.001$) [15, 16]. Additionally, their negative attitudes about the relevance and lack of motivation in using clinical practice guidelines were related to decreased use [15, 16]. Furthermore, nurses resistant to change and lacking in motivation and commitment towards adhering to the use of clinical practice guidelines were less likely to use them. Nurses who were convinced that clinical practice guidelines improved, supported practice and patient outcomes were more likely to report the use of and adherence to them [17]. The latter was the opposite when compared to those who did not perceive the usefulness of clinical practice guidelines [17]. The literature further indicates that when nurses perceived clinical practice guidelines as useful and relevant, they were more likely to encourage other nurses to use and adhere to the guidelines [18].

Knowledge is a facilitator for the use and adherence to clinical practice guidelines. Hence, training and education at the start of implementation and continuing education throughout the implementation process of clinical practice guidelines are recommended for nurses striving to increase the use and adherence to guidelines [19, 20, 21, 22, 23, 24].

A study on barriers to TB/HIV treatment guidelines adherence among NIMART trained nurses in KwaZulu-Natal (KZN) and North West (NW) Provinces concluded that there is a need for South Africa to recognize, accept and address the available barriers to treatment guidelines adherence [25]. Furthermore, the same study identified that adherence to TB/HIV treatment guidelines is a complex encounter which calls for innovative solutions [25]. The following challenges were highlighted: the need for increased

communication; supportive supervision between clinical and facility management with NIMART nurses; enlargement in human resources to condense workload; reported attitudes of NIMART trained nurses and appropriate documentation of clinical records [25]. Hence, this paper was designed and developed to determine factors facilitating trained NIMART nurses' adherence to TB/HIV treatment guidelines in KZN and NW Provinces of South Africa.

Methods

A qualitative, exploratory-descriptive design was used to describe and explore the phenomenon of interest through eliciting the viewpoints of people most affected [25, 26]. Systematic random sampling was used to select sixteen facilities which consisted of eight CHCs and eight PHCs from KZN and NW provinces respectively. The population comprised of all NIMART trained nurses in KZN and NW Provinces of South Africa initiating and managing ART and anti-TB treatment [25]. Convenience sampling was used to sample nurses who had 12 months and more working in community health centres (CHC) or primary healthcare clinics (PHC), accredited to provide ART services [25]. All CHC and PHC NIMART trained nurses were recruited to participate and only 24 of them agreed to participate in the study. The researcher visited the unit as per appointment to get the signed consent of the participants.

Data was collected focus group discussions. The individual interview was conducted in a quiet room using the English language for 45 – 60 minutes. One central question asked was *"what are factors that facilitators to treatment guidelines adherence among NIMART-trained nurses" which was followed up by probing and follow-up questions in relation to adherence to treatment guidelines.*

Study Setting

The study was conducted in the Ugu district of KwaZulu-Natal Province (KZN) and Ngaka Modiri Molema District in the North West (NW), South Africa [25].

Data collection

Focus group discussion (FGD) was used to collect data and the participants were asked a central question: '*What are the factors facilitating adherence to treatment guidelines among NIMART trained nurses?'* which was one of the FGD guide questions from the parent study [27]. The central question was discussed while probing and follow-up questions enhanced the quality of data collected [25]. All participants had the liberty of choosing the time of the day for the FGDs and as well as follow-up sessions. The FGDs were conducted in one of the hospitals in Port Shepstone and North-West University School of Nursing Sciences boardroom and each lasted between 90 and 140 min [25, 27]. A digital recorder was used to document all FGDs.

Observational and field notes aided in the triangulation of data collected. Data were collected until saturation, where no new information was emerging at the fourth session of each of FGDs from both districts. Audiotaped data were transcribed verbatim for posting the discussion for further analysis.

For data analysis, transcripts were matched with audiotapes, observational notes and field notes to ensure the correctness of the transcripts [25, 27]. Descriptive analysis was carried out using demographic datasheet to describe the demographic characteristics of the participants. ATLAS.ti software program (version 7.0) was used following the basic steps of notice-collect-think (NCT) analysis [25, 27, 28]. The researchers began by noting prominent and recurrent features of the data and this was collated following the predetermined codes [25, 27, 28]. The process included the following steps: getting acquainted with the collected raw data; generating a directory of all the codes and categories; application of the code directory to all the raw data through marking transcripts with the codes; separating all related raw data bearing the same code to a different document; and inferring themes developing from the analysed data in relation to the range and strength of opinions emerging, as well as establishing perceived relations between the themes [25, 27, 28]. Vital points were illustrated through the verbatim quotations from the FGDs and these were further controlled by the available literature. Trustworthiness was ensured through the four principles of Lincoln and Guba's framework [29]. Credibility was ascertained by a prolonged engagement which increased rapport and with participants. Data triangulation was confirmed by using different data collection methods through field notes, in-depth individual interviews, referential adequacy and co-coder. Confirmability was ensured by audit trail of voice recorder and the field notes to determine that the conclusions, interpretations and recommendations were indeed traceable to the sources. Transferability was ensured through the thick description of the research methods and design.

Results

All participants were NIMART-trained nurses, of whom the majority were female (n=17; 70.8%) and their age ranged from 24 to 58 years [25, 27]. The experience ranged between 3-4 years and they worked in both PHC (n= 11; 45.8%) and CHC (n= 13; 54.2%) [25, 27]. The two themes that emerged were positive attitudinal needs and positive behavioural change. Positive attitudinal needs incorporated improved accessibility to development and implementation of treatment guidelines; motivation, support and supervision; adaptation to practice change; and improved knowledge and awareness. Positive behavioural change incorporated organisational-structural changes, user-friendly guidelines and patient responsiveness. Table 1 summarises the themes and sub-themes that emerged from the analysed data [27].

Table 1. Themes and sub-themes as facilitators of adherence to treatment guidelines

SUB-THEME	CATEGORY
1.1 Positive attitudinal needs	1.1.1 Improved accessibility, usability and availability of treatment guidelines
	1.1.2 Motivation, support and supervision
	1.1.3 Adaptation to practice change
	1.1.4 Improved knowledge and awareness
1.2 Positive behavioural change	1.2.1 Organisational-structural changes
	1.2.2 User-friendly guidelines
	1.2.3 Patient responsiveness

1. Factors facilitating trained NIMART nurses' adherence to treatment guidelines

The possibility of improved usage and adherence to treatment guidelines was raised in this study. NIMART trained nurses indicated that adherence to treatment guidelines could be improved. The findings revealed two factors, thus, positive attitudinal needs and positive behavioural change. These were regarded as factors that nurses felt could promote their level of adherence to treatment guidelines.

1.1 Positive Attitudinal Needs

Among the nurses initiating and managing ART and anti-TB treatment in KZN and NWP, the following needs were identified and expressed, namely, improved accessibility, usability and availability of Treatment Guidelines; motivation, support and supervision; adaptation to practice change and improved knowledge and awareness.

1.1.1 Improved accessibility, usability and availability of Treatment Guidelines

NIMART trained nurses expressed that a simplified and easy-to-use guideline (e.g., handbook, pocketbook and flowcharts) could improve the usage of treatment guidelines and therefore promote adherence to treatment guidelines. The participants expressed their views as follows:

"A portable guideline that can be accessible and owned by any health care provider can ease and promote adherence, not just one guideline for the clinic." (P9, FGD 4, male, 44 years old)

"If they can change just a little bit of the size so that it can be like a handbook that is easy to use and quick to go through." (P 4, FGD 1, female, 56 years old)

1.1.2 Motivation, Support and Supervision

Nurses need support in their role as caregivers such that they follow or comply with the treatment guidelines correctly and accurately. This study's findings established that NIMART trained nurses could

adhere better to treatment outcomes if they get adequate support and are supervised in their caregiving role. This was evident in the following participant's submission:

"We need support and encouragement to carry out our nursing duties to the best of quality possible. Weekly or monthly supervision or support visits can increase the level of adherence and guidelines usage among nurses and this will promote the quality provision of care to our patients." (P 10, FGD 2, male, 34 years old)

However, NIMART trained nurses felt that if there is a good working relationship between health care workers, then the patients can be treated systematically with a higher level of adherence to treatment guidelines. Participants articulated the following:

"A good working relationship can promote adherence to treatment guidelines as not only nurses provide care to TB and HIV patients." (P 8, FGD 2, female, 41 years old)

"We are supposed to work hand-in-glove [hand in hand] with one another for the provision of quality care to our patients." (P 11, FGD 4, female, 33 years old)

1.1.3 Adaptation to practice change

Participant nurses said that they do want to change, but the system does not allow them as the pressure of task-shifting catches up with them as the implementers. One participant voiced the following:

"The department of health should allow us, nurses, to move slowly as this was not our scope of practice to be well orientated, knowledgeable and skilful. The reason we don't want to move from our past routines is that it takes time to acclimatise to the new things. I was trained for NIMART in 2011, but I still find it hard to fully understand the initiation and management of ART." (P 10, FGD 2, male, 34 years old)

A gradual change in the health care system may be useful in providing nurses with sufficient time to adapt and accommodate the relevant changes in health care practice and the TB & HIV service needs. Some participants felt that they do not always keep pace with the novelty and growth in practice and this reduces their adherence to treatment guidelines. Essentially, a gradual orientation to the NIMART could readily improve their adherence to treatment guidelines.

1.1.4 Improved knowledge and awareness

Sufficient orientation, knowledge, updates, training and follow-up training to NIMART and other nursing practices were identified in this study as priorities that could raise the level of adherence to treatment guidelines. One participant responded:

"I think more nurses need to be trained in NIMART or all nurses in each facility need to be trained as this causes gaps in the health care provision. Patients won't be returned back [sic] because of a trained nurse not being available." (P 6, FGD 1, male, 26 years old)

This sentiment accentuates the point on the provision of training and education concerning treatment guidelines in promoting adherence and use of guidelines. This was further corroborated by the need for follow-up training conducted within nurse practice settings as this would significantly reduce the shortage of trained nurses. One participant emphasised:

“We know it is impossible to train everyone in time, but if there is something new coming, even if it’s not a formal training but trainers can visit the facilities just to provide an insight on the available change while training is taking place.” (P 4, FGD 3, male, 27 years old)

1.2 Positive Behavioural Change

It was evident from the focus group interviews that changes in behaviour could increase the level of adherence to treatment guidelines, especially within the following categories: organisational-structural changes, user-friendly guidelines and patient responsiveness.

1.2.1 Organisational-structural changes

Organisational-structural changes comprised of the need for adequate time, ample human resources, reduced workload, improved communication, availability and accessibility of the core guidelines. If there is adequate time, it would be easy for NIMART trained nurses to use and adhere correctly to the guidelines – the participants verbalised this as follows:

“We need enough time to work with patients as well as to follow the guidelines correctly. Instead of the system pushing us to do more quantity meaning more headcount per day, it should provide time for us to provide quality care to our patients. There is no use for a patient to spend the prescribed 2 hours in the clinic and you find that no quality care provided to this patient.” (P 1, FGD 1, female, 43 years old)

“Reduced workload and reduced time pressure can increase adherence to treatment guideline and also promote the provision of quality care to our TB and HIV patients.” (P 8, FGD 2, female, 41 years old)

“We know it is impossible to train everyone in time but if there is something new coming, even if it’s not a formal training but trainers can visit the facilities just to provide an insight on the available change while training is taking place.” (P 10, FGD 2, male, 34 years old)

The availability of treatment guidelines was raised as another strategy in the promotion of adherence to treatment guidelines among NIMART nurses. These guidelines ought to be available in every consulting room within each facility and must be accessible to the NIMART trained nurses providing TB and HIV services. One participant had to say this:

“Guidelines need to be made available in the facilities for easy use and accessibility. However, not just one guideline, but enough for each health care provider as this will reduce the time for looking for a guideline or waiting for one to be done with it so that one can use it.” (P 6, FGD 3, female, 49 years old)

Nurses also voiced that proper communication channels could promote adherence to treatment guidelines. A participant spoke on this point in insightful ways:

“Good communication between the implementers, programme managers, coordinators and supervisors can promote adherence to treatment guidelines. Any change needs to be communicated to the implementers’ way beforehand not just in the implementation phase.” (P 7, FGD 4, female, 46 years old)

1.2.2 User-friendly guidelines

Provision of simple, clear and easy-to-use treatment guidelines could improve the use and level of adherence. One participant expressed the following point to endorse this observation:

“A simple guideline that is clear and at the level of nurses can be of help to us as it will be easy to understand and go through. The chart or handbook or pocketbook will be of greater help. But I like that diagram like poster … Yes, the algorithm type of guidelines. It is simple and easy to follow rather than the book.” (P 12, FGD 4, male, 42 years old)

1.2.3 Patient responsiveness

The ability of patients to fully participate in their ART and TB treatment was raised as an issue in the facilitation and adherence to treatment guidelines. Some participants indicated:

“Sometimes we need patients on board; we don’t monitor patients because they are not available or complying to the monthly visits that we set for them. If patients can adhere and follow all that we say to them this can ease our work and promote adherence to treatment guidelines.” (P 5, FGD 3, female, 58 years old)

“I agree with you patients are our customers and their availability and engagement in the provision of ART and TB treatment can increase our adherence.” (P 6, FGD 3, female, 49 years old)

Discussion

The NIMART nurses expressed the need for guidelines written in a simple and uncluttered style to allow and promote both content and message clarity. It was also emphasised that the size of the guideline should be manageable and portable to carry around. Literature also confirms that the use of treatment guidelines is promoted when nurses perceive the treatment guideline is usable in daily practice [19]. Furthermore, treatment guidelines could be implemented correctly and adhered to when they are easy to understand, straight-forward and user-friendly [30].

Nurses felt that there is a need to be supervised, motivated and supported in implementing treatment guidelines so that adherence can be promoted. The importance of constant supervision that is provided to NIMART nurses until they get used to correctly implementing treatment guidelines was raised across the cohort of participants in both provinces. This was affirmed by literature which indicates how support

from physicians, programme managers, programme coordinators and facility supervisors can promote adherence to treatment guidelines among nurses initiating and managing ART and anti-TB treatment [19]. However, NIMART trained nurses felt that if there is a good working relationship between health care workers, patients can be treated well and with a higher level of adherence to treatment guidelines. Adherence to treatment guidelines can be promoted when there is lateral cooperation between health care providers. Any gap in this protocol of communication was perceived as an impediment and a reason for non-adherence identified [19, 30]. Thus, communication and good working relationships should be enhanced to promote adherence to guidelines. NIMART nurses highlighted that they do want to change, but the system overwhelms them as the pressure of task-shifting, continuous guidelines changes and developments in the management of TB/HIV over-stretches them as the programme implementers. Quite often, the FGDs raised the point that these nurses are not consulted or engaged in those changes and developments that consequently affect them directly.

There is a sentiment that there should be a continuous provision of training about treatment guidelines implementation to promote adherence and usage. Participants also insisted that the introduction of new TB/HIV services ought to be gradual as nurses needed time to adjust to the novel changes. Other studies revealed that nurses acknowledged the importance of training orientation and education regarding treatment guidelines to promote adherence and use [19, 30]. This was further corroborated by the need for follow-up training conducted within nurse practice settings as this would reduce the shortage of NIMART trained nurses. Another study emphasises the importance of educational outreach visits with the use of a trained person or team of health care professionals from other organisations who meet with nurses in their facilities to share information with the intent of changing the providers' practice as well as enhance their level of knowledge [31].

The reduced workload promotes the adherence and use of treatment guidelines with ease. A manageable workload enables the use of and adherence to treatment guidelines among nurses initiating and managing ART and anti-TB treatment [19]. Furthermore, nurses submitted that a sufficiently trained nursing workforce would promote the continuation of care in the health facilities and this would further promote the adherence to treatment guidelines as NIMART-trained nurses could then be apportioned duties without overstretching the numbers.

The availability of treatment guidelines was raised as another approach to promoting adherence to treatment guidelines among NIMART-trained nurses. These guidelines ought to be available in every consulting room within each facility. They ought to be accessible to the NIMART-trained nurses providing TB/HIV services. Guideline use is promoted when the organisation makes the treatment guidelines readily available to the nurses concerned [19]. Nurses also indicated that proper communication channels could be favourable in adherence to treatment guidelines and their use thereof. Other studies show that the communication between guideline developers and implementers is necessary to promote adherence and use of the treatment guidelines [19, 31]. Provision of simple, clear and easy-to-use treatment guidelines can improve the use and level of adherence. This viewpoint was borne out by different authors that clear

and easy to understand guidelines stand a greater chance to be used and thus improve the level of adherence [19, 31, 32].

In addition, the ability of patients to fully participate in their ART and TB treatment was raised as an issue in facilitating adherence to treatment guidelines. This includes patients availing themselves of all necessary evaluations and adhering to their therapy regimes and prescriptions. However, it was also found that some patients perceived no need for guidelines, as they were not health care providers and the use of guidelines could only be perceived as a lack of confidence in what the health care provider does. Some studies suggest that guidelines are time-consuming [19, 31, 32, 33, 34, 35].

Conclusion

The study has clarified different aspects that need to be addressed to facilitate the adherence to guidelines by NIMART trained nurses. Factors such as continuous TB/HIV related training, support supervision and improved relationships with managers and colleagues, all need to be provided, promoted and enhanced to reach the desired outcomes efficiently and effectively. Cumulatively, these aspects exert a positive impact on service delivery**.** It is recommended that the inclusion of NIMART trained nurses in the development of treatment guidelines may promote their use and adherence. Support supervision from TB/HIV programme supervisors and trainers should be made available constantly and debriefing sessions conducted with NIMART trained nurses regularly. Regular in-service training for all stakeholders should be implemented, in tandem with seminars or workshops with NIMART trained nurses designed to update them and offer refresher courses. Further research in this practice could evaluate improvements in the implementation of guidelines as well as the impact thereof.

Abbreviations

ART : Antiretroviral Therapy

CD4 : Cluster of Differentiation 4

CHC : Community Health Centre

FGD : Focus Group Discussion

HIV : Human Immunodeficiency Virus

KZN : Kwazulu-Natal

MDR-TB : Multi-Drug Resistant TB

NCT : Notice- Collect- Think

NIMART : Nurse-Initiated Management of Antiretroviral Therapy

NRF : National Research Foundation

NW : North West

NWP : North West Province

P : Participant

PHC : Primary Health Care

STIs : Sexually Transmitted Infections

TB : Tuberculosis

WHO : World Health Organisation

XDR-TB : Extensively drug-resistant TB

Declarations

Ethics approval and consent to participate

Ethical standards were ensured by obtaining the ethical clearance North-West University ethics committee (NWU-000033-14-A9). Permission to conduct the study was granted by the KZN and NW Provinces Department of Health. Permission was also sought from the participating Health Facilities where Health Care workers were interviewed. Informed written consent was sought from the participants before commencement. Participation in the study was voluntary and confidentiality and data safety were maintained.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and analysed during the current study are not publicly available due to the nature of ethical approval which stated that only the research team had access to the collected data but are available from the corresponding author upon reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Contributions

LM and MDM conceptualised, designed and conducted (data collection) the study. LM, MDM, RTL and SMM analysed data, wrote, read, edited and approved the final manuscript**.**

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