

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

LUFUNO MAKHADO (✉ [lufuno.makhado@univen.ac.za](mailto:lufuno.makhado@univen.ac.za))

University of Venda <https://orcid.org/0000-0003-1689-9308>

**Mashudu Davhana-Maselesele**

University of Pretoria

**Rachel Tsakani Lebese**

University of Venda School of Health Sciences

**Sonto Maria Maputle**

University of Venda School of Health Sciences

---

## Research article

**Keywords:** Adherence, NIMART, NIMART-trained nurses, TB/HIV, Treatment Guidelines

**Posted Date:** April 14th, 2020

**DOI:** <https://doi.org/10.21203/rs.3.rs-15526/v2>

**License:** © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

**Version of Record:** A version of this preprint was published on August 17th, 2020. See the published version at <https://doi.org/10.1186/s12912-020-00470-6>.

# Abstract

**Background:** Globally the burden of tuberculosis or human immunodeficiency virus (TB/HIV) is at 24% with 3% global health workforce and this an alarming rate that World Health Organization (WHO) declared African region as a critical workforce shortage area. To facilitate adherence to treatment guidelines, WHO recommended a strategy of task shifting for these countries with high health workforce shortages. The strategy aimed at the redistribution of health care tasks to available workers. The purpose of the study was to determine factors facilitating trained nurse-initiated management of antiretroviral therapy (NIMART) nurses' adherence to TB/HIV treatment guidelines in KwaZulu-Natal (KZN) and North West (NW) Provinces of South Africa.

**Design:** The study was qualitative, explorative and descriptive in nature. The population comprised of 24 participants who were purposively selected. The in-depth focus group discussion was conducted. Data analysis was through the used of ATLAS T.I. software program (version 7.0) and followed the basic steps of notice-collect-think (NCT) analysis. Trustworthiness and ethical consideration were ensured.

**Results:** The following one theme namely; marked identified needs to be met to promote adherence to treatment guidelines and sub-themes emerged from raw data: Expected positive attitudinal needs outlined and an outline of a positive behavioural change.

**Conclusion:** Factors such as continuous training, support supervision and improved relationships with colleagues need to be enhanced to enable NIMART nurses to adhere to treatment guideline.

## Background

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

Task shifting is an old phenomenon, in France and China substitutes for physicians was practised as far as the 19<sup>th</sup> century [7]. In African countries, training of non-physician was done for different roles with good health outcomes although there are critics who suggest that task shifting which is done uncritically at the expense of health workers and often leads to low salary, poor working condition 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 guideline through adherence to guidelines by NIMART trained nurses. Accurate implementation of treatment guidelines is of vital importance if the TB/HIV treatment outcomes are to be realized. Implementation of ART initiation was phased indifferently at different points of time in South Africa. Before 2009, South African treatment guidelines reserved initiation of antiretroviral therapy (ART) for adults with CD4 counts  $< 200/\text{mm}^3$  [10]. In 2010, the revised guidelines outlined eligibility for ART among persons with TB/HIV to include those with CD4 cell count  $350 \text{ cells}/\text{mm}^3$  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 to prolong the lives of people living with HIV (PLWH), to minimize the negative effects of TB on the course of HIV, and to interrupt 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 of TB and HIV [12, 13]. Although the focus of this study is on HIV and TB, and professional nurses (PN) are trained on NIMART programme to provide a comprehensive TB/HIV management. Since adherence to treatment is a key determinant of TB/HIV treatment outcomes, the use of facilitators to implementing guidelines should be promoted [14]. The evidence highlights that nurses generally display a more positive attitude about implementing clinical practice guidelines as compared to physicians ( $p < 0.001$ ) [15, 16]. Additionally, their negative attitudes about the relevance and a lack of motivation in using clinical practice guidelines were related to a decreased use [15, 16]. Furthermore, nurses who resistant to change and lacked motivation and commitment, towards adhering to the use of clinical practice guidelines were less likely to use them. Nurses who believed that clinical practice guidelines improved, supported practice and patient outcomes were more likely to report the use of and adhered 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 to be useful and relevant, they are more likely to encourage other nurses to use and adhere [18].

Knowledge is a facilitator for the use and adherence of 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 by nurses to increase the use and adherence [19, 20, 21, 22, 23, 24].

A study on barriers to TB/HIV treatment guidelines adherence among nurse in initiating and managing antiretroviral therapy (ART) in Kwazulu-Natal (KZN) and North West (NW) Provinces concluded that South Africa as a country needs to identify, acknowledge and address barriers to treatment adherence [25]. The same study identified that adherence to TB/HIV treatment guidelines is a multifaceted challenge which

requires innovative solutions to solve them. The following challenges were highlighted: the need to increase communication; supportive supervision between clinical and facility management with NIMART nurse; increase in human and clinical level resources to reduce workload; attitudes of NIMART trained nurses and proper documentation of clinical records [25]. Hence, this paper sought 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 contextual design was used. Non-probability, purposive sampling was used to select sixteen facilities (eight CHCs and eight PHCs) from KZN and NW provinces. The population comprised of all NIMART trained nurses in KZN and NW Provinces of South Africa who were initiating and managing ART and anti-TB treatment. Purposive sampling was used to recruit nurses who had at least 12 months in a community health centre (CHC) or primary healthcare centre (PHC), accredited to provide ART services. All NIMART trained nurses from CHCs and PHCs were recruited to participate and only 24 agreed to partake participation in the study. The study sample consisted of only 24 participants of NIMART trained nurses who agreed and consented to participate in the study. The researcher visited the unit as per appointment for obtaining the consent form with 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 two districts within two provinces, Ugu district Kwazulu-Natal Province (KZN) and Ngaka Modiri Molema District North West (NW) Provinces of South Africa.

### Data collection

Focus group discussion was used to collect data and each discussion was initiated with the central question 'what are the factors facilitating treatment guidelines adherence among NIMART trained nurses. The central question was discussed within all sessions and was characterised with multiple probing and follow-up questions related to their adherence to the treatment guidelines. Participants' were provided with the liberty of choosing the time of the day for the focus group discussions and as well as follow-up sessions. The focus group discussion sessions were conducted out in a quiet room at one of the hospitals in Port Shepstone and North-West University School of Nursing Sciences boardroom and lasted for 90–140 min. Digital recorder was used to record all focus group discussions.

Observational and field notes were made. Data were collected until saturation, where no new information was emerging at the fourth session as no other new information arose from the FGD from both districts.

Audiotaped data were transcribed verbatim for later analysis.

For data analysis, transcripts were compared with audiotapes, observational notes and field notes to confirm the correctness of the transcribed data. Demographic characteristics were analysed from the demographic datasheet. This study used ATLAS T.I. software program (version 7.0) and followed the basic steps of notice-collect-think (NCT) analysis [26]. These basic steps enabled the researchers to work in a systematic manner instead of declaring the software to be the method itself [26]. The researchers started by noticing aspects of the data that led to an idea for a label and began to collect what was noticed in the form of codes [26]. This involved the following steps: familiarization with raw data; identifying an index of all the codes and categories to be used from the raw data; applying the index to all the raw data by noting transcripts with the codes; charting all the raw data from the same code in a particular document; and interpreting themes from the charts in relations to the range and strength of opinions, as well as any associations or relationships between themes [26]. Quotations from these interviews are used in the present article to illustrate vital points which had also been controlled using available literature. Trustworthiness was ensured through the four principles of Lincoln and Guba's framework [27]. Credibility was ensured by a prolonged engagement which increased rapport and to clarify descriptions with participants through familiarity. Data triangulation was ensured 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 the conclusions, interpretations and recommendations if traced from their sources. Transferability was ensured through the thick description of the research methods and design.

## Results

All participants were NIMART-trained nurses, of whom 17 were female (70.8%) and only seven were males (29.2%). Age of the NIMART-trained nurses ranged from 24 to 58 years. The experience ranged between 3-4 years and they were working in both PHC (n= 11) and CHC (n= 13). 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. The Positive behavioural change incorporated Organisational-structural changes, user-friendly guidelines and patient responsiveness. Table 1 present the summary of the themes and sub-themes that emerged from the analysed data.

### **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 can be improved. The findings revealed two factors or themes, thus: Positive attitudinal needs and positive behavioural change. Hence, these were regarded as factors that nurses felt can 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 go through guideline (e.g., handbook, pocketbook and flowcharts) which is more user-friendly can 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 caregiving role to follow or comply with the treatment guidelines correctly and accurately. This study’s findings revealed that NIMART trained nurses can adhere better to treatment outcomes if they are given support and are being supervised in their caregiving role. This was evident when a participant said:

“We need support and encouragement to be able to carry our nursing duties at ease and 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, patients can be treated well and with a higher level of adherence to treatment guidelines.

Participants articulated:

“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 is catching up with them as the implementers. One participant verbalised:

“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 of the health care system may be useful to provide nurses with relevant time to become on par with the changes in health care practice and the TB & HIV service needs. Some participants feel that as they do not always keep up with the sudden growth in practice and this reduces their adherence to treatment guidelines. So, a gradual orientation to the NIMART can really improve their adherence to treatment guidelines.

#### **1.1.4 Improved knowledge and awareness**

Enough orientation, knowledge, updates, training and follow-up training to NIMART and other nurses were revealed in this study as priorities that can increase 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 because of a trained nurse not being available.” (P 6, FGD 1, male, 26 years old)

This sentiment emphasises that the provision of training and education concerning treatment guidelines promotes adherence and use of guidelines. This was further corroborated by the identified need for follow-up training to be conducted within nurse practice settings as this will 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 can increase the level of adherence to treatment guidelines and this was regarding the following categories, namely: organisational-structural changes, user-friendly guidelines and patient responsiveness.

#### **1.2.1 Organisational-structural changes**

Organisational-structural changes comprised of need for enough time, enough human resource, reduced workload, improved communication, guideline availability and guideline accessibility. If there is enough

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 approach to promoting adherence to treatment guidelines among NIMART nurses. These guidelines need to be available in every consulting room within each facility and need to be accessible to the NIMART trained nurses providing TB and HIV services. A 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 verbalised that proper communication channels can promote or be favourable towards the adherence to treatment guidelines and their use thereof. A participant verbalised this aptly:

“A 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 go through treatment guidelines can improve the use and level of adherence. One participant expressed:

“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 that can facilitate 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 a guideline to be written in a simple manner which is easy for them to follow. It was also emphasised that the size of the guideline should be manageable and easy 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]. Francke, Smit, de Veer and Mistiaen indicated that guidelines that are easy to understand, can easily be tried out and do not need specific resources have a better chance of being implemented correctly and adhered to [28].

Nurses felt that there is a need to motivate and support nurses in implementing guideline so that they can be motivated to adhere to them. It was also indicated that it is very important to have constant supervision provided to them until they get used to using these guidelines. 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 and a communication gap as a reason for non-adherence was also identified [19, 28]. Communication and working relationships should be enhanced to promote adherence to guidelines. Participant nurses said that they do want to change, but the system does not allow them as the pressure of task-shifting is catching up with them as the implementers.

There is a sentiment which emphasises that there should be the continuous provision of training and education about treatment guidelines implementation to promotes adherence and use of guidelines. It has also been noted that the introduction of this service by nurses needed to be gradual as nurses indicated that they needed time to adjust to the introduced change. Other studies revealed that nurses acknowledged the importance of training orientation and education regarding treatment guidelines adherence and use [19, 29]. This was further corroborated by the identified need for follow-up training to be conducted within nurse practice settings as this will reduce the shortage of trained nurses. Other studies had emphasised the importance of educational outreach visits with the use of a trained person or team of health care professionals from other institutions or organisations who meet with nurses in their

facilities to give information with the intent of changing the providers' practice as well as enhance their level of knowledge [29].

The reduced workload was said to be promoting the adherence and use of treatment guidelines with ease. A manageable workload is assistive to the use of and adherence to treatment guidelines among nurses initiating and managing ART and anti-TB treatment [19]. Furthermore, nurses verbalised that a sufficiently trained nursing workforce would promote the continuation of care in the health facilities and this will further promote the adherence to treatment guidelines as there will enough or good coverage with NIMART-trained nurses.

The availability of treatment guidelines was raised as another approach to promoting adherence to treatment guidelines among NIMART-trained nurses. These guidelines need to be available in every consulting room within each facility and need 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 verbalised that proper communication channels can promote or be favourable towards the adherence to treatment guidelines and their use thereof. Other studies stated that the communication between guideline developers and implementers is necessary to promote adherence and use of the treatment guidelines [19, 29].

Provision of simple, clear and easy to go through 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, 29, 30].

The ability of patients to fully participate in their ART and TB treatment was raised as an issue that can facilitate adherence to treatment guidelines. This issue includes patients availing themselves of all necessary evaluations and adhering to their therapies. 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 depicted lack of confidence to what the health care provider is doing and was time-consuming [19, 29, 30, 31, 32, 33].

## **Conclusion**

The study has revealed different aspects that need to be addressed to facilitate the adherence to guidelines by NIMART trained nurses. This included factors such as continuous TB/HIV related training, support supervision and improved relationships with managers and colleagues, all these need to be provided, promoted and enhanced to reach the desired outcomes efficiently and effectively, and which impact positively to 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 should be conducted with NIMART trained nurses regularly. Regular in-service training for all stakeholders should be implemented and regular seminars or workshops with NIMART trained nurses

should be provided to update them and offer refresher courses. Further research should be conducted to 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 be sought from the participating Health Facilities where Health Care workers would be 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/or analysed during the current study are not publicly available due to the nature of ethical approval which stated that only the research team will have access to the collected data but are available from the corresponding author on reasonable request.

### **Competing interests**

The authors declare that they have no competing interests.

### **Funding**

The study was funded by the Atlantic Philanthropies and Thuthuka NRF grant (TTK160601167061). Funders did not play any role in the conceptualisation, design, drafting and approval of the manuscript.

### **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.

### **Acknowledgements**

The authors acknowledge all NIMART-trained nurses who participated in the study.

## **References**

1. O'Brien P, Gostin LO. Health worker shortages and global justice. *Health Worker Shortages and Global Justice*, Millbank Memorial Fund. 2011 Nov 28.
2. Baine SO, Kasangaki A, Baine EM. Task shifting in health service delivery from a decision and policymakers' perspective: a case of Uganda. *Human resources for health*. 2018 Dec 1;16(1):20.

3. World Health Organization. Task shifting to tackle health worker shortages. Geneva: World Health Organization. 2007.
4. McPake B, Mensah K. Task shifting in health care in resource-poor countries. *Lancet*. 2008 Sep 13.
5. Rispel LC, Blaauw D, Ditlopo P, White J. Human resources for health and universal health coverage: progress, complexities and contestations. *South African Health Review*. 2018 Mar 1;2018(1):13-21.
6. Iwu EN, Holzemer WL. Task shifting of HIV management from doctors to nurses in Africa: clinical outcomes and evidence on nurse self-efficacy and job satisfaction. *AIDS Care*. 2014 Jan 2;26(1):42-52.
7. World Health Organization. Working together for health: The World health report 2006: policy briefs.
8. Callaghan M, Ford N, Schneider H. A systematic review of task-shifting for HIV treatment and care in Africa. *Human resources for health*. 2010 Dec 1;8(1):8.
9. World Health Organization. Antiretroviral Therapy for HIV Infection in Adults and Adolescents: Recommendations for a Public Health Approach. Geneva: World Health Organization. 2010.
10. Department of Health. Clinical Guidelines for the Management of HIV in Department of Health, Government of South Africa. National Antiretroviral Treatment Guidelines, 2004.
11. National Department of Health. Clinical guidelines for the management of HIV & AIDS in adults and adolescents. Pretoria. 2010.
12. Dlwati LV, Mavundla TR, Mbengo F. Facilitators for and barriers to the implementation of national tuberculosis management guidelines. *Africa Journal of Nursing and Midwifery*. 2017;19(3):1-20.
13. Department of Health and South African National Aids Council. Let Our Actions Count. Reflections on NSP 2012–2016 and Moving Forward to NSP 2017–2022. Pretoria: Department of Health and South African National Aids Council. 2017
14. Moore JE, Uka S, Vogel JP, Timmings C, Rashid S, Gülmezoglu AM, Straus SE. Navigating barriers: two-year follow up on recommendations to improve the use of maternal health guidelines in Kosovo. *BMC public health*. 2016 Dec 1;16(1):987.
15. Jeffery AD, Pickler RH. Barriers to nurses' adherence to central venous catheter guidelines. *JONA: The Journal of Nursing Administration*. 2014 Jul 1;44(7/8):429-35.
16. Jun J, Kovner CT, Stimpfel AW. Barriers and facilitators of nurses' use of clinical practice guidelines: an integrative review. *International journal of nursing studies*. 2016 Aug 1;60:54-68.
17. Ebben RH, Vloet LC, van Grunsven PM, Breeman W, Goosselink B, Lichtveld RA, Mintjes-De Groot JA, van Achterberg T. Factors influencing ambulance nurses' adherence to a national protocol ambulance care: an implementation study in the Netherlands. *European Journal of Emergency Medicine*. 2015 Jun;22(3):199.
18. McCluskey A, Vratsistas-Curto A, Schurr K. Barriers and enablers to implementing multiple stroke guideline recommendations: a qualitative study. *BMC Health Services Research*. 2013; 13, 323–336, [https:// dx.doi.org/10.1186/1472-6963-13-323](https://dx.doi.org/10.1186/1472-6963-13-323).

19. Abrahamson KA, Fox RL, Doebbeling BN. Facilitators and barriers to clinical practice guideline use among nurses. *AJN The American Journal of Nursing*. 2012 Jul 1;112(7):26-35.
20. Fischer F, Lange K, Klose K, Greiner W, Kraemer A. Barriers and strategies in guideline implementation –a scoping review. In *Healthcare* 2016 Sep (Vol. 4, No. 3, p. 36). Multidisciplinary Digital Publishing Institute.
21. Janssen MA, van Achterberg T, Adriaansen MJ, Kampshoff CS, Schalk DM, Mintjes-de Groot J. Factors influencing the implementation of the guideline triage in emergency departments: a qualitative study. *Journal of Clinical Nursing*. 2012 Feb;21(3-4):437-47.
22. Koh SS, Manias E, Hutchinson AM, Donath S, Johnston L. Nurses' perceived barriers to the implementation of a Fall Prevention Clinical Practice Guideline in Singapore hospitals. *BMC health services research*. 2008 Dec 1;8(1):105.
23. McCluskey A, Vratsistas-Curto A, Schurr K. Barriers and enablers to implementing multiple stroke guideline recommendations: a qualitative study. *BMC health services research*. 2013 Dec 1;13(1):323.
24. Sinuff T, Cook D, Giacomini M, Heyland D, Dodek P. Facilitating clinician adherence to guidelines in the intensive care unit: a multicenter, qualitative study. *Critical care medicine*. 2007 Sep 1;35(9):2083-9.
25. Makhado L, Davhana-Maselesele M, Farley JE. Barriers to tuberculosis and human immunodeficiency virus treatment guidelines adherence among nurses initiating and managing antiretroviral therapy in KwaZulu-Natal and North West provinces. *Curationis*. 2018;41(1):1-8.
26. Friese S. *Qualitative data analysis with ATLAS*. ti. SAGE Publications Limited; 2019 Mar 22.
27. Schwandt TA, Lincoln YS, Guba EG. Judging interpretations: But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New directions for evaluation*. 2007 Jun;2007(114):11-25.
28. Francke AL, Smit MC, de Veer AJ, Mistiaen P. Factors influencing the implementation of clinical guidelines for health care professionals: a systematic meta-review. *BMC medical informatics and decision making*. 2008 Dec;8(1):38.
29. Afreen S, Rahman MS. Adherence to treatment guidelines in a university hospital: Exploration of facts and factors. *Bangladesh Journal of Pharmacology*. 2014 Apr 10;9(2):182-8.
30. Mazrou SH. Expected benefits of clinical practice guidelines: Factors affecting their adherence and methods of implementation and dissemination. *Journal of Health Specialties*. 2013 Sep 1;1(3):141.
31. Lugtenberg M, Burgers JS, Westert GP. Effects of evidence-based clinical practice guidelines on quality of care: a systematic review. *BMJ Quality & Safety*. 2009 Oct 1;18(5):385-92.
32. Kruk ME, Gage AD, Arsenault C, Jordan K, Leslie HH, Roder-DeWan S, Adeyi O, Barker P, Daelmans B, Doubova SV, English M. High-quality health systems in the Sustainable Development Goals era: time for a revolution. *The Lancet Global Health*. 2018 Nov 1;6(11):e1196-252.
33. Sinuff T, Eva KW, Meade M, Dodek P, Heyland D, Cook D. Clinical practice guidelines in the intensive care unit: a survey of Canadian clinicians' attitudes. *Canadian Journal of Anesthesia*. 2007 Sep 1;54(9):728.

# Table

**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 Existing improved knowledge and awareness marked
1.2 Positive behavioural change	1.2.1 Organisational-structural changes
	1.2.2 User-friendly guidelines
	1.2.3 Patient responsiveness