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Nurse and Manager Perceptions of Nurse Initiated and Managed Anti-Retroviral Therapy (NIMART) Implementation in South Africa: A Qualitative Study

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ABSTRACT

Objective: To explore nurse and facility and programme manager perceptions of nurse initiated and managed antiretroviral therapy (NIMART) implementation in Gauteng, South Africa

Design: In this qualitative study, in-depth interviews and focus group discussions were conducted to gain insight into participants' experiences of NIMART implementation.

Setting: Participants came from urban, peri-urban and rural primary health care clinics in two Gauteng Province municipalities.

Participants: 25 nurses and 18 managers who were actively involved in NIMART implementation were purposively sampled.

Results: Findings from this study reveal that, despite encountering numerous challenges including human resources; training and clinical mentoring and health systems issues, NIMART-nurses and managers remained optimistic about their work. Study participants felt empowered by their expanded roles. Increased responsibilities associated with NIMART implementation encouraged better use of creative problem solving and teamwork to facilitate integration of NIMART into existing clinic services. NIMART-nurses perceived ART patients to be more insightful about their illness; engaged in their HIV treatment and aware of the importance of adherence which enhanced nurse-patient relationships and increased their sense of job satisfaction.

Conclusion:

NIMART implementation is complex, but if implemented well, increases ART access and improves patient outcomes. Supportive interventions which address the specific challenges faced by nurses providing NIMART now need to be implemented. Attempts should be made to replicate the positive aspects of NIMART implementation identified by participants as this may improve healthcare providers' experiences of task-shifting.

ARTICLE SUMMARY

Article focus

- To explore nurse and facility/programme manager perceptions of NIMART implementation in South Africa
- To identify key challenges and facilitating factors which impact on the NIMART implementation process

Key Messages

- Despite facing many challenges, nurses and managers were overwhelmingly positive about the opportunity to provide NIMART
- Key challenges included human resources, training and clinical mentoring and health-systems issues.
- Important enabling factors included facility-level teamwork; creative problem solving; regular and effective inter-facility communication; effective referral pathways and access to telephonic mentoring support.

Strengths and limitations of this study

- Utilising qualitative methodologies to explore nurse and manager perceptions of NIMART implementation provides in-depth insights into the impact of task-shifting on facility-level staff.
- The study was conducted during the early stages of NIMART implementation in South Africa within a context of intense political pressure to succeed, which may have biased participant responses.

INTRODUCTION

The antiretroviral therapy (ART) programme in South Africa provides ART for over 2 million individuals infected with human immunodeficiency virus (HIV).[1] Based on 2010 World Health Organization (WHO) eligibility criteria, this equated to just 50% of qualifying individuals accessing treatment.[2] In late 2010, seeking faster programme expansion, South African public health policy switched from doctor-based, hospital-centric ART services to decentralised provision of nurse initiated and managed ART (NIMART).[3] Such task-shifting – delegating tasks to less specialized healthcare personnel – represents a key component of the WHO's public health approach to ART programme scale-up.[4] Implementation of task-shifting, including NIMART, in Rwanda,[5] Malawi,[6] Mozambique,[7] Lesotho [8] and smaller projects in South Africa [9, 10] has generated positive gains including earlier, faster patient enrolment; improved patient outcomes; greater acceptability and accessibility (particularly for rural populations); reduced patient transport costs and improved patient retention.

NIMART is a complex intervention intended to improve healthcare access and equity, ideally without compromising quality of care, in resource-limited settings.[11, 12] Optimal task-shifting requires well-resourced, multi-dimensional support including: health systems strengthening;[13] intensive staff engagement, training and mentoring;[14, 15, 16] redistributing basic tasks to non-clinical staff [17] and robust referral, drug supply and quality assurance systems.[18] South Africa's plan to rapidly implement NIMART on an unprecedented nationwide scale raised questions regarding its capacity to meet all of these requirements.[13] If poorly managed, NIMART implementation risks inadequately supported nurses providing sub-optimal care, negatively impacting patient outcomes, staff confidence, morale and broader healthcare services.[19, 20]

Although individual, social, patient and organisational challenges are known to hinder effective healthcare change,[21] whether these factors influence change within ART programmes in resource-constrained settings have been little studied.[22, 23] Qualitative research - crucial to furthering our understanding of change within healthcare contexts – remains particularly scarce.[24] During early ART roll-out in South Africa those studies exploring healthcare worker experiences identified several challenges including insufficient staffing, high staff turnover, unmanageable workloads and burnout and inadequate planning, emotional support, communication and responsiveness from senior management.[25-27] Healthcare workers' experiences of adapting to NIMART related task-shifting need exploration.[28] The authors investigated South Africa's NIMART implementation process from the perspective of NIMART-nurses and their managers.

METHODS

Study Population and Setting

Nurses and facility/programme managers actively involved in NIMART implementation at urban, peri-urban and rural public primary healthcare (PHC) facilities across two municipalities (City of Johannesburg and Ekurhuleni) in Gauteng Province, South Africa were purposively sampled (n=43, Table 1). All participants were South Africa, one was Caucasian and five were male.

Table 1: Characteristics of Participants

Job Title (n)	Age in Years (Average)	Years in Nursing (Average)	Years as Manager (Average)
Facility Manager (8)	46-54 (49)	19-34 (25)	2-15 (8)
District/Regional Manager (3)	50-62 (55)	30-40 (35)	9-22 (14)
Senior Provincial Manager (3)	52-57 (55)	26-33 (30)	11-23 (15)
NGO Programme Manager (4, 2 Doctors)	35-55 (44)	20-27 (24)	1-8 (4)

NIMART-nurse already initiating (20)	32-63 (48)	4-39 (23)	n/a
NIMART-nurse trained, not yet initiating (5)	32-60 (49)	8-30 (22)	n/a

The study was conducted in early 2011, shortly after South Africa began NIMART roll-out. All nurse participants had completed requisite training and worked at facilities where implementation was underway, although not all nurses had begun initiating patients on ART.

Three in-depth interviews (provincial manager, facility manager and NIMART-nurse), three nurse focus groups and two manager focus groups (six to ten participants each) were conducted, all in English. Clinically active nurses and facility/programme managers participated in separate groups to enable open discussion. Following telephonic recruitment, study participants provided written consent before participating in their allocated discussion.

The University of Witwatersrand Human Research Ethics Committee granted ethics clearance (M10108) and Gauteng Department of Health approved the study.

Data Analysis

Audio recordings of interviews and focus groups were transcribed verbatim and transcripts were coded using NVivo 9 software, resulting in a framework of 84 narrowly defined codes. Coding was performed in stages, ensuring the researcher became fully immersed in the data during multiple passes over each transcript. Using thematic content analysis, the 84 initial codes were consolidated into four key themes: human resources; training and clinical mentoring; communication and networking and infrastructural and support system issues. Co-authors reviewed random excerpts from all transcripts, confirming coding accuracy. The consistency of major themes was checked by comparing data from in-depth interviews and focus groups, from participants working in different municipalities and from nurses and managers.

RESULTS

During discussions participants identified numerous challenges which were perceived to be hindering NIMART as well as several key enablers which facilitated implementation. The four key themes which emerged during data analysis are presented here.

'You are alone as a sister…there's nobody helping you': Human Resources

Human resource issues heavily influenced participants' experiences of NIMART implementation. Although one senior provincial manager asserted that current staffing levels were adequate - '*you don't even need extra nurses for this [NIMART]*' - NIMART-nurses and facility and district managers expressed frustration and disappointment because extra human resources, perceived as essential, had not been forthcoming. Reporting widespread professional nurse shortages, nurses described '*struggling to cope with the workload'* as a result of their additional NIMART responsibilities. Integrating NIMART into existing PHC services heightened target-related performance pressures, which, in some facilitates, created an increasingly unpleasant working environment. For some participants, this triggered growing resentment because they perceived task-shifting away from doctors as an 'abuse' of the role of nurses. As this 47 year old NIMART-nurse with 20 years of nursing experience relates:

> [NIMART is] a problem because we are only three [sisters]. We have ANC [antenatal care], child services, PHC, family planning, TB. All this basket of services to be rendered.

Nurse shortages were reported as being compounded by underrepresentation of lower cadres of healthcare worker. This left managers unable to delegate administrative and basic clinic tasks to 'down-stream' staff. One regional manager described how widespread shortages of enrolled nurses, nursing assistants, data collectors and counsellors precluded what was, to her understanding, true task-shifting. She concluded

that *'…as a nurse, you are everything… Jack of all trades'*. Considering nurses take '*up to an hour to initiate one ART-patient*', she noted that the inability to shift basic tasks away from nurses undermined the quality of care provided to the patient, prevented nurses from seeing sufficient numbers of ART-patients and lengthened waiting times for other patient groups. Additionally, important administrative activities, including maintaining patient registers and pharmacy records, were described as *'fall[ing] by the wayside'*. One facility manager, from a busy Johannesburg clinic, voiced her concerns:

> [The nurses] are so pressured, working right up to or past four o'clock. They don't have time to get their rooms in order or replenish medication. The poor nurses are on a fast train to I don't know where! They're just rushing and rushing – they're gonna make mistakes!

This tension between trying to meet performance targets including shorter waiting-times and higher patient turnover, whilst simultaneously striving to provide time-consuming, individualized care was raised by many participants. One regional manager asked:

> Are we looking at quality or quantity? NIMART is a very, very sensitive programme. We end up with patients defaulting because you don't have time for them - you are chasing the waiting-time target.

Despite human resource shortages, staff attitudes towards NIMART remained overwhelmingly positive. In particular, those whose relatives had died whilst awaiting

doctor-led ART initiation were enthusiastic and considered NIMART '*long overdue'*. Others found relief in providing continuity of care and initiating their own patients rather than knowing patients were waiting to initiate treatment at up-referral sites. Those familiar with preparing patients for doctor initiation and managing stable ART-patients talked about feeling ready and being 'excited' about the new responsibility, as this nurse explains:

> I was really very excited to do NIMART…it was unnecessary for me to send patients [away] whereas I can initiate myself. I was a little worried about side-effects but I was not at all scared. I told myself these things I've been exposed to a long time.

The implementation process was particularly influenced by facility manager attitudes, as illustrated by this facility manager's description of her approach to NIMART:

> I'm somebody very different, receptive to anything. I'm saying to others who are still very negative that they should open their eyes and have some open mind. We need to open our clinics, even if they are small - even if it can be in the foyer - as long as patients get treatment. We need to do this!

Where facility managers such as the one cited above were flexible, took pride in their facility and sought to improve standards; clinic staff were described as happier, more enthusiastic and hardworking and displaying greater capacity to cope with and adapt to

new roles and responsibilities. As one younger nurse described, such positive attitudes proved contagious, and drew additional staff into the NIMART programme which created a strong, supportive team able to provide an improved service:

> I just went to see [the NIMART service] and then I thought 'wow, this is so interesting!' I think [my manager] loves working with HIV patients. So I said 'ok, let me sit, let me listen' and then I got this thing that 'ok, I can do this if the other sister can'. Wow! I was so excited. We support each other very much - even if you feel there's pressure, there's somebody next to you who will grab you and say 'let's do it'… Teamwork is very important.

Where a supportive, team-oriented culture prevailed, staff appeared more resilient to change-related pressures and morale seemed higher, whereas in facilities with an individualistic ethos, negative experiences were more common. This participant, who was the only NIMART-nurse at her facility, described feeling unsupported by nursing colleagues:

> [My colleagues] always say 'no, we're not trained'. They were just piling everything for me. When I went on leave clients were not given [ART] treatment. The first day I came back [colleagues said] 'we're so long waiting for you!' Then I turned my back, I said 'no, I'm not doing it. Somebody must take over. It's not my job - it's everybody's job!'

Contrastingly, nurses working within well-established teams described improvising and working together to overcome barriers to NIMART implementation:

> …space is a challenge but we improvise because our clinic is very hectic. I said 'you have to be flexible...just find a corner'. We did some partitioning so we could do counselling [and improve] the patient flow. I was fortunate; people were very flexible and hard-working.

Alongside effective teamwork, positive experiences of caring for ART-patients also engendered more supportive staff attitudes. Nurses reported that ART-patients tend to be more insightful about their illness; more engaged in their management and more aware of the importance of treatment adherence compared to other patient groups. This NIMART-nurse, from a small peri-urban site, described her enjoyment of working with ART-patients:

> It's very nice to initiate patients on ART. You get to know the patients deeper. You talk about side-effects, the CD4 count. You feel like 'I'm building a relationship between me and this patient'. The patient gets confidence in you, they will tell you 'Sister, I've got sores in my mouth and I'm worried – what do you think?' They will be specific.

Others shared about the satisfaction they derived from playing a key role in their patients' recovery. Rather than losing track of patients following up-referral, nurses were now

witnessing patients, including terminally ill individuals, rapidly improving on treatment. Tangibly impacting patients' lives incentivised nurses and boosted morale:

> The relationship I build with patients, it's nice. You can see if your patient is progressing well or if the condition is deteriorating. I'm doing PMTCT [prevention of mother-to-child transmission] so you make that relationship, the patient delivers, you follow-up the baby. It's nice if the baby is negative.

These positive experiences led participants to persuade other colleagues to become NIMART-nurses. They wanted their peers to experience the satisfaction of providing life-changing care.

***'I'm not yet ready [to initiate]…I still have hiccups…I need support':* Training and Clinical Mentoring**

Non-governmental organisation (NGO) programme managers, who were partnering with Department of Health (DoH) to support NIMART implementation, shared the difficulties created by '*rolling out the service and* then *capacitating the nurses'*. DoH pressure to implement NIMART quickly often resulted in poorly co-ordinated NGO-supported training activities.

Although nurses who attended off-site training described it as comprehensive and informative they criticised managers for haphazard coordination and inappropriate staff selection. In some facilities nurses who were '*not interested in NIMART*' undermined programme sustainability by refusing to attend training. Several nurses described the difficulties created by having only one trained nurse at their facility:

> [Managers] don't care how many nurses have undergone training and some nurses are reluctant to go for training and start this initiation thing so if you go for training maybe you are the only one. All the HIV patients they'll be saying 'it's your patients, this is your problem, take them to sister X' - now it becomes my problem - it was really tough.

One district manager responded to inconsistent training coverage by instituting facility-by-facility on-site training. This approach ensured *'everybody in the clinic becomes trained and feel[s] comfortable with initiation through group mentorship'*. Fellow managers responded enthusiastically to this model:

> That's very good. If [trainers] come to the clinic they face the reality there. Normally, with training, they use an ideal situation then you come back down to earth with a hard bump. Also it helps many more people get trained rather than taking one person out at a moment. I would really like it, I'm very excited. I wish we could follow that!

Supporting partners' limited capacity to provide follow-up mentoring and conduct competency assessments for trained nurses was also identified as a challenge. Consequently, several nurses described providing NIMART before they felt confident enough to do so and reported feeling concerned because they were *'learning as we are going on'* and '*taking chances'*:

> It was a bit unfair for [NIMART] to be introduced in that fashion because there was no in-service training, there was nothing given. We were dish-upping the medication just like that and, as time went by, we discovered so many things that we did wrong.

Many experienced uncertainty when interpreting abnormal laboratory results, managing complex co-morbidities or ART-associated adverse events. One 58 year old nurse based at a small, peri-urban facility, described how uncertain she felt during her first unsupervised ART initiation:

> At first it was scary - I was a little bit jittery because I was on my own. I had mentoring for about a week but when I took over, eh! I started shivering. I prayed: 'God, help me to go through this thing, I can't go alone on this journey'

Conversely, other nurses described receiving support from mentors who were *'just a phone call away'*. Such telephonic support proved crucial as it enabled these nurses to gain confidence gradually despite minimal on-site mentorship, and provided essential

opportunity for debriefing. Debriefing enabled nurses to re-engage with NIMART after a patient death had affected their self-confidence:

> I remember this patient I initiated [who] died. I felt bad...very bad. I thought 'no, this [NIMART] is just not for me.' I had that guilty feeling until [my mentor] scrutinised the file and reassured me: 'no, you did everything that you could, it's not your fault, you were saving a life, you did nothing wrong' so, at least I was a little bit better but sometimes you feel people will think you are killing patients.

In contrast, at facilities without telephones, or where up-referral site doctors were *'refusing to come on board'* as mentors, inexperienced nurses described feeling isolated. The inadequate feedback provided by up-referral sites when patients returned to their original PHC facility also left nurses discouraged due to the lost opportunity for skills-transfer. Doctors were perceived as failing to recognise nurses as '*human beings [who] really want to communicate with human beings'*. As this 54 year old NIMART-nurse explains:

> I think [doctors] don't understand the importance of the report back. It is a learning tool for a sister so that next time, when you get a patient like this, you know what to do. If they don't send us report how are we going to learn? Because we are not doctors, we are nurses.

In some facilities where mentorship from supporting partners or up-referral site doctors was lacking, informal 'in-house' mentoring - provided by more experienced NIMART-nurses - emerged as an invaluable means to capacity-build newly trained colleagues. One experienced NIMART-nurse described the impact her 'in-house' mentoring had on programme sustainability at her facility:

> I started alone here as a NIMART-nurse. Now two other [trained] sisters are being mentored by me. They are coming very well. The facility staff worried because if I'm away what will the clinic do? So now, at least, if I'm away these two sisters are here.

These 'nurse-mentors' represented a highly acceptable and much needed alternative source of clinical support. One NGO programme manager, facing limited mentoring capacity within her organisation, concluded: '*in terms of sustainability, nurses who are competent have to start to mentor their own colleagues'*.

***"Communication is one way down, they tell us what to do….we don't have a say"*: Communication, Consultation and Networking**

Research participants shared how the DoH's approach to change management had created anger and confusion amongst some staff. Following minimal consultation, they

were unhappy that *'the [NIMART] programme is failing because we are not involved in planning'*.

Facility managers also expressed dissatisfaction regarding 'readiness assessments', during which senior managers conducted site visits to establish a facility's capacity to provide NIMART. These visits were perceived as *'just an exercise'* which provided limited opportunities for staff to communicate their perceived needs and concerns. Several participants were clearly angered by their assessment experience:

> The assessor said: 'It's not ideal but start anyway!' It's not like you are really OK to do this, but start! These words we hear a lot with our managers: 'Do whatever you can with what we have.' I just want to die when I hear that because that's not good enough for me!

Effective communication between facility-level staff often ameliorated the frustration arising from inadequate communication between senior management and ground-level staff. Inter-facility networking provided vital opportunity to encourage others and iron-out programmatic issues. For nurses, regular case-based training meetings increased their knowledge and confidence and allowed isolated NIMART-nurses, such as those cited above, to debrief with understanding peers. For facility-managers, meeting other managers to share skills, ideas, frustrations and experiences assisted with problem solving.

Regular meetings between PHC facilities and up-referral hospital staff also facilitated NIMART implementation by improving communication, addressing referral pathway weaknesses and building more supportive inter-collegial relationships. In areas without regular inter-facility meetings, these relationships remained strained, often resulting in patients being unnecessarily sent between various facilities due to poor communication, as this nurse explains:

> [The up-referral sites] chase patients away. If that patient has a letter from the clinic they know that for the sister to refer means that they're stuck. We were told 'if you don't know the diagnosis send them to the hospital'. Really, phoning, I don't accept it - why must we pamper [the doctors] by phoning [first]?

Communication is vital to the success of any health programme, including NIMART. Inadequate staff consultation during planning impacted staff morale and hindered their capacity to fully implement NIMART. Contrastingly, effective communication and positive interactions between different levels of care became a critical component for task-shifting success.

'These little hovels….it's disgraceful, really!': Infrastructure, Support Systems and Innovative Integration Models

Challenges associated with infrastructural shortcomings were ubiquitous, even before NIMART rollout began, but were often compounded as clinics began dealing with

increasing numbers of ART patients. Staff at clinics with limited space described how they were *'no longer coping with the number of patient[s]',* additional stock and extra services. These infrastructural constraints impacted morale; compromised staff health and affected clinic efficiency. Poor infrastructure also undermined NIMART-nurses' capacity to safeguard patient confidentiality during consultations. One nurse shared her distress about the situation at her facility:

> It's not nice. I want to talk about issues - the patient cannot speak loud because there's no space - we are dividing with cupboards or a curtain in one room so we can see four patients at each corner, which is not right.

Participants also identified various other systems related challenges including: limited access to off-site investigations such as chest x-rays; cumbersome data collection processes which kept '*changing like petticoats*', out-dated telecommunications systems, fragmented patient transport services and complicated drug ordering processes. One busy inner-city clinic manager described her current situation:

> …now I don't have [ART] medication because when we order it's such a process. I'm going to take from another site, say[ing] 'give me about three packs and when I get my stock I'll give you three back'. It's all about starting [patients] - nobody cares whether the systems are in place.

However, some participants described how creative problem solving at facility level eased NIMART integration, successfully addressing many implementation challenges whilst minimising disruption to other PHC services. NIMART implementation appeared to empower these nurses as it allowed them to develop systems which worked for them. They reported increased job satisfaction and lower levels of concern about staff burnout and unmanageable stress.

Two such integration models particularly captured other participants' imagination when shared during the group discussions. One clinic established an internal up and down-referral system within which time-consuming ART-initiation patients were managed by the NIMART-nurse. On a rotational basis, every nurse operated as 'NIMART-nurse' for one week. Once stable, ART-patients were 'down-referred' within the clinic to the general PHC nurses who '*kept the chronics* [diabetic/hypertensive patients] *queue moving*'. Thus the NIMART-nurse had more time to spend with complex patients whilst well patients could be seen quickly. Stable ART-patients benefited from 'down-referral' because queuing with other 'chronic' patients protected their confidentiality and reduced waiting times. Additionally, as explained by the facility manager, the regular rotation ensured all nurses became NIMART providers, thus strengthening programme sustainability:

> [Nurses] rotate so that they know everything. I don't get paralyzed when one sister is not on duty and she's specializing in that role. Three to four people are rotating: ANC, tuberculosis, wellness programme, chronics, ARVs.

Another smaller clinic, with just one NIMART-nurse, was now '*reserving Fridays for initiations'* so that he could spend sufficient time preparing these patients.

Thus, although infrastructural shortcomings threatened to undermine NIMART success at many sites, some facility managers demonstrated remarkable innovation, adapting integration models to overcome staffing and space constraints whilst minimising disruption to existing services. For many participants, NIMART implementation was perceived as empowering as it enabled them to develop and use systems that worked within their local context.

DISCUSSION

NIMART implementation is a complex health intervention. The experiences described above reflect key challenges and enabling factors which influence the quality of NIMART services provision. Despite the challenges, many managers and NIMART-nurses experienced providing antiretroviral therapy to their patients very positively; this was enhanced with structural and management support.

Human resource shortages are a well-recognised hindrance to rapid ART programme expansion. Considering 40% of nursing posts in South Africa lie vacant [29] and up to

50% of nursing time is consumed by administrative tasks,[30, 31] concerns regarding over-dependence on nurse-based task-shifting for ART scale-up appear well founded.[13] The importance of expanding lower cadre staff compliments to perform basic tasks, traditionally assigned to nurses, has been stressed elsewhere.[8, 17] This study highlights the sustainability issues created when task-shifting to nurses is undertaken without providing sufficient 'down-stream' staff. Realistic, standardised 'down-stream' staffing levels and revised scopes of practice should be developed and universally implemented.[12] Where resource constraints preclude provision of additional clinical staff, data capturers, administrative clerks, nursing auxiliaries and community healthcare workers – who require shorter training and lower remuneration - represent a vital means of improving health service efficiency and sustainability.[12] Importantly, however, facility managers also need to be better capacitated and motivated to effectively manage existing staff compliments and optimally task-shift so that everyone performs appropriate duties.[32]

Quality, safe task-shifting inarguably relies on comprehensive training, mentoring and on-going quality assurance.[5, 33] Unfortunately, in this study, NIMART-nurses and managers reported that hasty NIMART implementation had seriously compromised access to these crucial capacity-building interventions. This undermined individual nurses' confidence and left many facilities with an unsustainable NIMART programme where only one nurse had been trained. Importantly, however, participants remained optimistic and identified two practical interventions which may mitigate this situation. Firstly, a shift is needed towards fast-tracking nurse-mentor development in which

experienced NIMART-nurses need to be equipped to supervise, support and train colleagues at their own and nearby facilities. Secondly, nurses require reliable access to telephonic support, perhaps through greater involvement of doctors at up-referral sites. These interventions might also address the emotional support and debriefing needs of nurses caring for patients with advanced disease, something which should not be under-estimated in a context such as South Africa.[34]

Effective inter-facility communication, mutual support, teamwork and the use of creative problem solving at the facility-level were all important factors in enabling the successful implementation of NIMART. The theoretical benefits of teamwork [15] were described by participants working in 'happy' clinics where NIMART appeared to cause less disruption, stress and discontent. A culture of teamwork and innovative problem solving needs to be nurtured, particularly at poorly performing facilities, to better enable nurses and their managers to deal with NIMART implementation.

The human resource and infrastructural constraints described in this study echo problems widely recognised as hindering ART-programme expansion in resource-limited settings.[35, 36] Although NIMART can effectively expand ART access it also continues to restrict service provision to increasingly overcrowded fixed facilities operating with limited human resources. Therefore, implementation of NIMART in isolation will likely fail to address the long-term sustainability of South Africa's ART programme.[37] Task-shifting to nurses represents just one facet of decentralisation and there remains a need to look beyond traditional PHC facility-based services towards chronic care models which

involve patients in self-management and community support. Shifting the care of healthy, stable ART-patients out of fixed facilities has been shown to further improve patient outcomes and reduce reliance on overstretched health services, releasing healthcare workers to spend more time and effort on the sick and on improving long term patient retention.[38-41] Although South Africa is now implementing a new primary healthcare model in which community healthcare workers will provide health promotion and prevention interventions at community and household levels,[42] future national health policies may need to go even further, engaging patients with any chronic condition (HIV, diabetes, hypertension) in self-management and utilising them as community healthcare workers, peer educators, lay counsellors and expert patients who provide community-based patient support.[43, 44]

Limitations and Future Research

This study took place early during South Africa's NIMART implementation process, when few nurses had started initiating ART and there was still much uncertainty about the programme. A follow-up study, once NIMART is firmly established in more facilities across South Africa, may shed light concerning healthcare providers' longer term adaptation to changing roles. The study was undertaken in an environment of intense political pressure to make NIMART succeed, which may have influenced participant

responses. There is limited rural representation and those working in rural facilities may have differing perceptions about NIMART implementation.

Further research is needed to evaluate those clinics and districts which are considered 'successful' in order to better understand NIMART implementation. The behavioural nuances which enable some to embrace change and overcome challenges need to be better understood as this may inform the development of more sophisticated change management strategies that address resistance to change. On-going difficulties with referral processes indicate a need to develop and implement effective referral system strengthening interventions. Communication and inter-facility meetings also need to be considered in more detail to explore whether they facilitate improved relationships between staff and thus smoother referral systems.

CONCLUSION

Despite the barriers to, and challenges of, NIMART, the overarching impression given by participants in this study is a positive one. In particular, whilst those who had recently started providing NIMART may have tended towards negativity, more experienced NIMART-nurses expressed greater optimism about the new programme, suggesting perhaps that perceptions may shift as clinical confidence grows.

Participants demonstrated an impressive capacity to overcome challenges and improve ART provision through determined innovation, creative problem solving, teamwork and positive attitudes. Targeted supportive interventions which meet the specific needs of facility-level implementers should now be implemented to enable them to continue providing quality NIMART services. Similarly, facilitators identified here need to be replicated across South Africa and other countries, harnessing their potential to ease healthcare providers' experience of change.

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Nurse and Manager Perceptions of Nurse Initiated and Managed Anti-Retroviral Therapy (NIMART) Implementation in South Africa: A Qualitative Study

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TITLE PAGE

TITLE

Nurse and Manager Perceptions of Nurse Initiated and Managed Anti-Retroviral Therapy (NIMART) Implementation in South Africa: A Qualitative Study

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ABSTRACT

Objective: To explore nurse and facility and programme manager perceptions of nurse initiated and managed antiretroviral therapy (NIMART) implementation in Gauteng, South Africa

Design: In this qualitative study, in-depth interviews and focus group discussions were conducted to gain insight into participants' experiences of NIMART implementation.

Setting: Participants came from urban, peri-urban and rural primary health care clinics in two Gauteng Province municipalities.

Participants: 25 nurses and 18 managers who were actively involved in NIMART implementation were purposively sampled.

Results: Findings from this study reveal that, despite encountering numerous challenges including human resources, training and clinical mentoring and health systems issues, NIMART-nurses and managers remained optimistic about their work. Study participants felt empowered by their expanded roles. Increased responsibilities associated with NIMART implementation encouraged better use of creative problem solving and teamwork to facilitate integration of NIMART into existing clinic services. NIMART-nurses perceived ART patients to be more insightful about their illness, engaged in their HIV treatment and aware of the importance of adherence which enhanced nurse-patient relationships and increased their sense of job satisfaction.

Conclusion:

Although the implementation of NIMART is complex, when NIMART is implemented well, ART access is increased and patient outcomes are improved. Supportive interventions which address the specific challenges faced by nurses providing NIMART now need to be implemented. Attempts should be made to replicate the positive aspects of NIMART implementation identified by participants as this may improve healthcare providers' experiences of task-shifting.

ARTICLE SUMMARY

Article focus

- To explore nurse and facility/programme manager perceptions of NIMART implementation in South Africa
- To identify key challenges and facilitating factors which impact on the NIMART implementation process

Key Messages

- Despite facing many challenges, nurses and managers were overwhelmingly positive about the opportunity to provide NIMART
- Key challenges included human resources, training and clinical mentoring and health-systems issues.
- Important enabling factors included facility-level teamwork, creative problem solving, regular and effective inter-facility communication, effective referral pathways and access to telephonic mentoring support.

Strengths and limitations of this study

- Utilising qualitative methodologies to explore nurse and manager perceptions of NIMART implementation provides in-depth insights into the impact of task-shifting on facility-level staff.
- The study was conducted during the early stages of NIMART implementation in South Africa within a context of intense political pressure to succeed, which may have biased participant responses.

INTRODUCTION

The antiretroviral therapy (ART) programme in South Africa provides ART for over 2 million individuals infected with human immunodeficiency virus (HIV).[1] Based on 2010 World Health Organization (WHO) eligibility criteria, this equated to just 50% of qualifying individuals accessing treatment.[2] In late 2010, seeking faster programme expansion, South African public health policy switched from doctor-based, hospital-centric ART services to decentralised provision of nurse initiated and managed ART (NIMART).[3] Such task-shifting – delegating tasks to less specialised healthcare personnel – represents a key component of the WHO's public health approach to ART programme scale-up.[4] Implementation of task-shifting, including NIMART, in Rwanda,[5] Malawi,[6] Mozambique,[7] Lesotho [8] and smaller projects in South Africa [9, 10] has generated positive gains including earlier, faster patient enrolment; improved

patient outcomes; greater acceptability and accessibility (particularly for rural populations); reduced patient transport costs and improved patient retention.

NIMART is a complex intervention intended to improve healthcare access and equity, ideally without compromising quality of care, in resource-limited settings.[11, 12] Optimal task-shifting requires well-resourced, multi-dimensional support including: health systems strengthening;[13] intensive staff engagement, training and mentoring;[14, 15, 16] redistributing basic tasks to non-clinical staff [17] and robust referral, drug supply and quality assurance systems.[18] South Africa's plan to rapidly implement NIMART on an unprecedented nationwide scale raised questions regarding its capacity to meet all of these requirements.[13] If poorly managed, NIMART implementation risks inadequately supported nurses providing sub-optimal care, negatively impacting patient outcomes, staff confidence, morale and broader healthcare services.[19, 20]

Although individual, social, patient and organisational challenges are known to hinder effective healthcare change,[21] whether these factors influence change within ART programmes in resource-constrained settings have been little studied.[22, 23] Qualitative research - crucial to furthering our understanding of change within healthcare contexts – remains particularly scarce.[24] During early ART roll-out in South Africa those studies exploring healthcare worker experiences identified several challenges including insufficient staffing, high staff turnover, unmanageable workloads and burnout and inadequate planning, emotional support, communication and responsiveness from senior management.[25-27] Healthcare workers' experiences of adapting to NIMART related

task-shifting need exploration.[28] The authors investigated South Africa's NIMART implementation process from the perspective of NIMART-nurses and their managers.

METHODS

Study Population and Setting

The study was conducted in early 2011, shortly after South Africa began NIMART roll-out. Few facilities had begun the implementation process so study sites were selected if they had started implementing NIMART and had at least one NIMART-trained nurse. A mixture of urban, peri-urban and rural public primary healthcare (PHC) facilities from two municipalities (City of Johannesburg and Ekurhuleni) in Gauteng Province, South Africa was selected to ensure broad representation of facility types. Nurses (n=25, Table 1) from each site were then purposively sampled on the basis that they had completed requisite NIMART-training, although not all had begun initiating patients on ART. At facilities with more than one NIMART-trained nurse, all were invited to participate but typically, to avoid service delivery disruption, one nurse was released to attend the focus group discussion. Manager participants (n =18, Table 1) were invited to join the study if they were actively involved in NIMART implementation at one or more of the study sites. One nurse refused to participate and two senior managers were unable to attend their scheduled focus group. All participants were South African, one was Caucasian and five were male.

Table 1: Characteristics of Participants

Job Title (n)	Age in Years (Average)	Years in Nursing (Average)	Years as Manager (Average)
Facility Manager (8)	46-54 (49)	19-34 (25)	2-15 (8)
District/Regional Manager (3)	50-62 (55)	30-40 (35)	9-22 (14)
Senior Provincial Manager (3)	52-57 (55)	26-33 (30)	11-23 (15)
NGO Programme Manager (4, 2 Doctors)	35-55 (44)	20-27 (24)	1-8 (4)
NIMART-nurse already initiating (20)	32-63 (48)	4-39 (23)	n/a
NIMART-nurse trained, not yet initiating (5)	32-60 (49)	8-30 (22)	n/a

Three in-depth interviews (provincial manager, facility manager and NIMART-nurse), three nurse focus groups and two manager focus groups (six to ten participants each) were conducted, all in English. Clinically active nurses and facility/programme managers participated in separate groups to enable open discussion. Following telephonic recruitment, study participants provided written consent before participating in their

allocated discussion. All interviews and focus group discussions, which were led by one researcher who utilised previously piloted interview and focus group guides, lasted between sixty and ninety minutes. The researcher was supported by a note-taker where possible. In order to minimise bias during data collection, the researcher (a doctor and nurse-mentor employed by a supporting partner organisation) had no pre-existing relationship with any of the nurses included in the study. She had provided technical support to one of the facility managers prior to NIMART roll-out at that site. None of the other authors had pre-existing relationships with any of the study participants.

The University of Witwatersrand Human Research Ethics Committee granted ethics clearance (M10108) and Gauteng Department of Health approved the study.

Data Analysis

Audio recordings of interviews and focus groups were transcribed verbatim and transcripts were coded using NVivo 9 software, resulting in a framework of 84 narrowly defined codes. Coding was performed in stages, ensuring that the researcher became fully immersed in the data during multiple passes over each transcript. Using thematic content analysis, the 84 initial codes were consolidated into four key themes: human resources; training and clinical mentoring; communication and networking and infrastructural and support system issues. Co-authors reviewed random excerpts from all transcripts, confirming coding accuracy. The consistency of major themes was checked by

comparing data from in-depth interviews and focus groups, from participants working in different municipalities and from nurses and managers.

RESULTS

During discussions participants identified numerous challenges which were perceived to be hindering NIMART as well as several key enablers which facilitated implementation. The four key themes which emerged during data analysis are presented here.

'You are alone as a sister…there's nobody helping you': Human Resources

Human resource issues heavily influenced participants' experiences of NIMART implementation. Although one senior provincial manager asserted that current staffing levels were adequate - '*you don't even need extra nurses for this [NIMART]*' - NIMART-nurses and facility and district managers expressed frustration and disappointment because extra human resources, perceived as essential, had not been forthcoming. Reporting widespread professional nurse shortages, nurses described '*struggling to cope with the workload'* as a result of their additional NIMART responsibilities. Integrating NIMART into existing PHC services heightened target-related performance pressures,

which, in some facilitates, created an increasingly unpleasant working environment. For some participants, this triggered growing resentment because they perceived task-shifting away from doctors as an 'abuse' of the role of nurses. As this 47 year old NIMART-nurse with 20 years of nursing experience relates:

> [NIMART is] a problem because we are only three [sisters]. We have ANC [antenatal care], child services, PHC, family planning, TB. All this basket of services to be rendered.

Nurse shortages were reported as being compounded by underrepresentation of lower cadres of healthcare worker. This left managers unable to delegate administrative and basic clinic tasks to 'down-stream' staff. One regional manager described how widespread shortages of enrolled nurses, nursing assistants, data collectors and counsellors precluded what was, to her understanding, true task-shifting. She concluded that *'…as a nurse, you are everything… Jack of all trades'*. Considering nurses take '*up to an hour to initiate one ART-patient*', she noted that the inability to shift basic tasks away from nurses undermined the quality of care provided to the patient, prevented nurses from seeing sufficient numbers of ART-patients and lengthened waiting times for other patient groups. Additionally, important administrative activities, including maintaining patient registers and pharmacy records, were described as *'fall[ing] by the wayside'*. One facility manager, from a busy Johannesburg clinic, voiced her concerns:

> [The nurses] are so pressured, working right up to or past four o'clock. They don't have time to get their rooms in order or replenish medication. The poor nurses are on a fast train to I don't know where! They're just rushing and rushing – they're gonna make mistakes!

This tension between trying to meet performance targets including shorter waiting-times and higher patient turnover, whilst simultaneously striving to provide time-consuming, individualised care was raised by many participants. One regional manager asked:

> Are we looking at quality or quantity? NIMART is a very, very sensitive programme. We end up with patients defaulting because you don't have time for them - you are chasing the waiting-time target.

Despite human resource shortages, staff attitudes towards NIMART remained overwhelmingly positive. In particular, those whose relatives had died whilst awaiting doctor-led ART initiation were enthusiastic and considered NIMART '*long overdue'*. Others found relief in providing continuity of care and initiating their own patients rather than knowing patients were waiting to initiate treatment at up-referral sites. Those familiar with preparing patients for doctor initiation and managing stable ART-patients talked about feeling ready and being 'excited' about the new responsibility, as this nurse explains:

> I was really very excited to do NIMART…it was unnecessary for me to send

> patients [away] whereas I can initiate myself. I was a little worried about side-effects but I was not at all scared. I told myself these things I've been exposed to a long time.

The implementation process was particularly influenced by facility manager attitudes, as illustrated by this facility manager's description of her approach to NIMART:

> I'm somebody very different, receptive to anything. I'm saying to others who are still very negative that they should open their eyes and have some open mind. We need to open our clinics, even if they are small - even if it can be in the foyer - as long as patients get treatment. We need to do this!

Where facility managers such as the one cited above were flexible, took pride in their facility and sought to improve standards; clinic staff were described as happier, more enthusiastic and hardworking and displaying greater capacity to cope with and adapt to new roles and responsibilities. As one younger nurse described, such positive attitudes proved contagious, and drew additional staff into the NIMART programme which created a strong, supportive team able to provide an improved service:

> I just went to see [the NIMART service] and then I thought 'wow, this is so interesting!' I think [my manager] loves working with HIV patients. So I said 'ok, let me sit, let me listen' and then I got this thing that 'ok, I can do this if the other sister can'. Wow! I was so excited. We support each other very much -

> even if you feel there's pressure, there's somebody next to you who will grab you and say 'let's do it'… Teamwork is very important.

Where a supportive, team-oriented culture prevailed, staff appeared more resilient to change-related pressures and morale seemed higher, whereas in facilities with an individualistic ethos, negative experiences were more common. This participant, who was the only NIMART-nurse at her facility, described feeling unsupported by nursing colleagues:

> [My colleagues] always say 'no, we're not trained'. They were just piling everything for me. When I went on leave clients were not given [ART] treatment. The first day I came back [colleagues said] 'we're so long waiting for you!' Then I turned my back, I said 'no, I'm not doing it. Somebody must take over. It's not my job - it's everybody's job!'

Contrastingly, nurses working within well-established teams described improvising and working together to overcome barriers to NIMART implementation:

> …space is a challenge but we improvise because our clinic is very hectic. I said 'you have to be flexible...just find a corner'. We did some partitioning so we could do counselling [and improve] the patient flow. I was fortunate; people were very flexible and hard-working.

Alongside effective teamwork, positive experiences of caring for ART-patients also engendered more supportive staff attitudes. Nurses reported that ART-patients tend to be more insightful about their illness; more engaged in their management and more aware of the importance of treatment adherence compared to other patient groups. This NIMART-nurse, from a small peri-urban site, described her enjoyment of working with ART-patients:

> It's very nice to initiate patients on ART. You get to know the patients deeper. You talk about side-effects, the CD4 count. You feel like 'I'm building a relationship between me and this patient'. The patient gets confidence in you, they will tell you 'Sister, I've got sores in my mouth and I'm worried – what do you think?' They will be specific.

Others shared about the satisfaction they derived from playing a key role in their patients' recovery. Rather than losing track of patients following up-referral, nurses were now witnessing patients, including terminally ill individuals, rapidly improving on treatment. Tangibly impacting patients' lives incentivised nurses and boosted morale:

> The relationship I build with patients, it's nice. You can see if your patient is progressing well or if the condition is deteriorating. I'm doing PMTCT [prevention of mother-to-child transmission] so you make that relationship, the patient delivers, you follow-up the baby. It's nice if the baby is negative.

These positive experiences led participants to persuade other colleagues to become NIMART-nurses. They wanted their peers to experience the satisfaction of providing life-changing care.

***'I'm not yet ready [to initiate]…I still have hiccups…I need support':* Training and Clinical Mentoring**

Non-governmental organisation (NGO) programme managers, who were partnering with Department of Health (DoH) to support NIMART implementation, shared the difficulties created by '*rolling out the service and* then *capacitating the nurses'*. DoH pressure to implement NIMART quickly often resulted in poorly co-ordinated NGO-supported training activities.

Although nurses who attended off-site training described it as comprehensive and informative they criticised managers for haphazard coordination and inappropriate staff selection. In some facilities nurses who were '*not interested in NIMART*' undermined programme sustainability by refusing to attend training. Several nurses described the difficulties created by having only one trained nurse at their facility:

> [Managers] don't care how many nurses have undergone training and some nurses are reluctant to go for training and start this initiation thing so if you go for training maybe you are the only one. All the HIV patients they'll be saying

> 'it's your patients, this is your problem, take them to sister X' - now it becomes my problem - it was really tough.

One district manager responded to inconsistent training coverage by instituting facility-by-facility on-site training. This approach ensured *'everybody in the clinic becomes trained and feel[s] comfortable with initiation through group mentorship'*. Fellow managers responded enthusiastically to this model:

> That's very good. If [trainers] come to the clinic they face the reality there. Normally, with training, they use an ideal situation then you come back down to earth with a hard bump. Also it helps many more people get trained rather than taking one person out at a moment. I would really like it, I'm very excited. I wish we could follow that!

Supporting partners' limited capacity to provide follow-up mentoring and conduct competency assessments for trained nurses was also identified as a challenge. Consequently, several nurses described providing NIMART before they felt confident enough to do so and reported feeling concerned because they were *'learning as we are going on'* and '*taking chances'*:

> It was a bit unfair for [NIMART] to be introduced in that fashion because there was no in-service training, there was nothing given. We were dish-upping the

medication just like that and, as time went by, we discovered so many things that we did wrong.

Many experienced uncertainty when interpreting abnormal laboratory results, managing complex co-morbidities or ART-associated adverse events. One 58 year old nurse based at a small, peri-urban facility, described how uncertain she felt during her first unsupervised ART initiation:

> At first it was scary - I was a little bit jittery because I was on my own. I had mentoring for about a week but when I took over, eh! I started shivering. I prayed: 'God, help me to go through this thing, I can't go alone on this journey'

Conversely, other nurses described receiving support from mentors who were *'just a phone call away'*. Such telephonic support proved crucial as it enabled these nurses to gain confidence gradually despite minimal on-site mentorship, and provided essential opportunity for debriefing. Debriefing enabled nurses to re-engage with NIMART after a patient death had affected their self-confidence:

> I remember this patient I initiated [who] died. I felt bad...very bad. I thought 'no, this [NIMART] is just not for me.' I had that guilty feeling until [my mentor] scrutinised the file and reassured me: 'no, you did everything that you could, it's not your fault, you were saving a life, you did nothing wrong' so, at least I was a little bit better but sometimes you feel people will think you are killing

patients.

In contrast, at facilities without telephones, or where up-referral site doctors were *'refusing to come on board'* as mentors, inexperienced nurses described feeling isolated. The inadequate feedback provided by up-referral sites when patients returned to their original PHC facility also left nurses discouraged due to the lost opportunity for skills-transfer. Doctors were perceived as failing to recognise nurses as '*human beings [who] really want to communicate with human beings'*. As this 54 year old NIMART-nurse explains:

> I think [doctors] don't understand the importance of the report back. It is a learning tool for a sister so that next time, when you get a patient like this, you know what to do. If they don't send us report how are we going to learn? Because we are not doctors, we are nurses.

In some facilities where mentorship from supporting partners or up-referral site doctors was lacking, informal 'in-house' mentoring - provided by more experienced NIMART-nurses - emerged as an invaluable means to capacity-build newly trained colleagues. One experienced NIMART-nurse described the impact her 'in-house' mentoring had on programme sustainability at her facility:

> I started alone here as a NIMART-nurse. Now two other [trained] sisters are being mentored by me. They are coming very well. The facility staff

worried because if I'm away what will the clinic do? So now, at least, if I'm away these two sisters are here.

These 'nurse-mentors' represented a highly acceptable and much needed alternative source of clinical support. One NGO programme manager, facing limited mentoring capacity within her organisation, concluded: '*in terms of sustainability, nurses who are competent have to start to mentor their own colleagues'*.

***"Communication is one way down, they tell us what to do….we don't have a say"*: Communication, Consultation and Networking**

Research participants shared how the DoH's approach to change management had created anger and confusion amongst some staff. Following minimal consultation, they were unhappy that *'the [NIMART] programme is failing because we are not involved in planning'*.

Facility managers also expressed dissatisfaction regarding 'readiness assessments', during which senior managers conducted site visits to establish a facility's capacity to provide NIMART. These visits were perceived as '*just an exercise'* which provided limited opportunities for staff to communicate their perceived needs and concerns. Several participants were clearly angered by their assessment experience:

> The assessor said: 'It's not ideal but start anyway!' It's not like you are really OK to do this, but start! These words we hear a lot with our managers: 'Do whatever you can with what we have.' I just want to die when I hear that because that's not good enough for me!

Effective communication between facility-level staff often ameliorated the frustration arising from inadequate communication between senior management and ground-level staff. Inter-facility networking provided a vital opportunity to encourage others and iron-out programmatic issues. For nurses, regular case-based training meetings increased their knowledge and confidence and allowed isolated NIMART-nurses, such as those cited above, to debrief with understanding peers. For facility-managers, meeting other managers to share skills, ideas, frustrations and experiences assisted with problem solving.

Regular meetings between PHC facilities and up-referral hospital staff also facilitated NIMART implementation by improving communication, addressing referral pathway weaknesses and building more supportive inter-collegial relationships. In areas without regular inter-facility meetings, these relationships remained strained, often resulting in patients being unnecessarily sent between various facilities due to poor communication, as this nurse explains:

> [The up-referral sites] chase patients away. If that patient has a letter from the clinic they know that for the sister to refer means that they're stuck. We were

told 'if you don't know the diagnosis send them to the hospital'. Really, phoning, I don't accept it - why must we pamper [the doctors] by phoning [first]?

Communication is vital to the success of any health programme, including NIMART. Inadequate staff consultation during planning impacted staff morale and hindered their capacity to fully implement NIMART. Contrastingly, effective communication and positive interactions between different levels of care became a critical component for task-shifting success.

'These little hovels….it's disgraceful, really!': Infrastructure, Support Systems and Innovative Integration Models

Challenges associated with infrastructural shortcomings were ubiquitous, even before NIMART rollout began, but were often compounded as clinics began dealing with increasing numbers of ART patients. Staff at clinics with limited space described how they were *'no longer coping with the number of patient[s]',* additional stock and extra services. These infrastructural constraints impacted morale; compromised staff health and affected clinic efficiency. Poor infrastructure also undermined NIMART-nurses' capacities to safeguard patient confidentiality during consultations. One nurse shared her distress about the situation at her facility:

> It's not nice. I want to talk about issues - the patient cannot speak loud because there's no space - we are dividing with cupboards or a curtain in one room so we can see four patients at each corner, which is not right.

Participants also identified various other systems related challenges including: limited access to off-site investigations such as chest x-rays; cumbersome data collection processes which kept '*changing like petticoats*', out-dated telecommunications systems, fragmented patient transport services and complicated drug ordering processes. One busy inner-city clinic manager described her current situation:

> …now I don't have [ART] medication because when we order it's such a process. I'm going to take from another site, say[ing] 'give me about three packs and when I get my stock I'll give you three back'. It's all about starting [patients] - nobody cares whether the systems are in place.

However, some participants described how creative problem solving at facility level eased NIMART integration, successfully addressing many implementation challenges whilst minimising disruption to other PHC services. NIMART implementation appeared to empower these nurses as it allowed them to develop systems which worked for them. They reported increased job satisfaction and lower levels of concern about staff burnout and unmanageable stress.

Two such integration models particularly captured other participants' imagination when shared during the group discussions. One clinic established an internal up and down-referral system within which time-consuming ART-initiation patients were managed by the NIMART-nurse. On a rotational basis, every nurse operated as 'NIMART-nurse' for one week. Once stable, ART-patients were 'down-referred' within the clinic to the general PHC nurses who '*kept the chronics* [diabetic/hypertensive patients] *queue moving*'. Thus the NIMART-nurse had more time to spend with complex patients whilst well patients could be seen quickly. Stable ART-patients benefited from 'down-referral' because queuing with other 'chronic' patients protected their confidentiality and reduced waiting times. Additionally, as explained by the facility manager, the regular rotation ensured all nurses became NIMART providers, thus strengthening programme sustainability:

> [Nurses] rotate so that they know everything. I don't get paralyzed when one sister is not on duty and she's specialising in that role. Three to four people are rotating: ANC, tuberculosis, wellness programme, chronics, ARVs.

Another smaller clinic, with just one NIMART-nurse, was now '*reserving Fridays for initiations'* so that he could spend sufficient time preparing these patients.

Thus, although infrastructural shortcomings threatened to undermine NIMART success at many sites, some facility managers demonstrated remarkable innovation, adapting integration models to overcome staffing and space constraints whilst minimising

disruption to existing services. For many participants, NIMART implementation was perceived as empowering as it enabled them to develop and use systems that worked within their local context.

DISCUSSION

NIMART implementation is a complex health intervention. The experiences described above reflect key challenges and enabling factors which influence the quality of NIMART services provision. Despite the challenges, many managers and NIMART-nurses experienced providing antiretroviral therapy to their patients very positively; this was enhanced with structural and management support.

Human resource shortages are a well-recognised hindrance to rapid ART programme expansion. Considering 40% of nursing posts in South Africa lie vacant [29] and up to 50% of nursing time is consumed by administrative tasks,[30, 31] concerns regarding over-dependence on nurse-based task-shifting for ART scale-up appear well founded.[13] The importance of expanding lower cadre staff complements to perform basic tasks, traditionally assigned to nurses, has been stressed elsewhere.[8, 17] This study highlights the sustainability issues created when task-shifting to nurses is undertaken without providing sufficient 'down-stream' staff. Realistic, standardised 'down-stream' staffing levels and revised scopes of practice should be developed and universally

implemented.[12] Where resource constraints preclude provision of additional clinical staff, data capturers, administrative clerks, nursing auxiliaries and community healthcare workers – who require shorter training and lower remuneration - represent a vital means of improving health service efficiency and sustainability.[12] Importantly, however, facility managers also need to be better capacitated and motivated to effectively manage existing staff complements and optimally task-shift so that everyone performs appropriate duties.[32]

Quality, safe task-shifting inarguably relies on comprehensive training, mentoring and on-going quality assurance.[5, 33] Unfortunately, in this study, NIMART-nurses and managers reported that hasty NIMART implementation had seriously compromised access to these crucial capacity-building interventions. This undermined individual nurses' confidence and left many facilities with an unsustainable NIMART programme where only one nurse had been trained. Providing on-site NIMART training to several nurses at a facility – as was happening in one district – would address this common problem. Importantly, despite these difficulties, participants remained optimistic and identified two further practical interventions which may mitigate this situation. Firstly, a shift is needed towards fast-tracking nurse-mentor development in which experienced NIMART-nurses need to be equipped to supervise, support and train colleagues at their own and nearby facilities. Secondly, nurses require reliable access to telephonic support, perhaps through greater involvement of doctors at up-referral sites. These interventions might also address the emotional support and debriefing needs of nurses caring for

patients with advanced disease, something which should not be under-estimated in a context such as South Africa.[34]

Effective inter-facility communication, mutual support, teamwork and the use of creative problem solving at the facility-level were all important factors in enabling the successful implementation of NIMART. Several benefits of teamwork [15] were described by participants working in 'happy' clinics where NIMART appeared to cause less disruption, stress and discontent. A culture of teamwork and innovative problem-solving should be nurtured to better enable nurses and their managers to deal with NIMART implementation. Establishment and support of quality improvement teams within facilities may be one means of strengthening this area.

The human resource and infrastructural constraints described in this study echo problems widely recognised as hindering ART-programme expansion in resource-limited settings.[35, 36] Although NIMART can effectively expand ART access it also continues to restrict service provision to increasingly overcrowded fixed facilities operating with limited human resources. Therefore, implementation of NIMART in isolation will likely fail to address the long-term sustainability of South Africa's ART programme.[37] Task-shifting to nurses represents just one facet of decentralisation and there remains a need to look beyond traditional PHC facility-based services towards chronic care models which involve patients in self-management and community support. Shifting the care of healthy, stable ART-patients out of fixed facilities has been shown to further improve patient outcomes and reduce reliance on overstretched health services, releasing healthcare

workers to spend more time and effort on the sick and on improving long term patient retention.[38-41] Although South Africa is now implementing a new primary healthcare model in which community healthcare workers will provide health promotion and prevention interventions at community and household levels,[42] future national health policies may need to go even further, engaging patients with any chronic condition (HIV, diabetes, hypertension) in self-management and utilising them as community healthcare workers, peer educators, lay counsellors and expert patients who provide community-based patient support.[43, 44]

Limitations and Future Research

This study took place early during South Africa's NIMART implementation process, when few nurses had started initiating ART and there was still much uncertainty about the programme. A follow-up study, once NIMART is firmly established in more facilities across South Africa, may shed light concerning healthcare providers' longer term adaptation to changing roles. The study was undertaken in an environment of intense political pressure to make NIMART succeed, which may have influenced participant responses. There is limited rural representation and those working in rural facilities may have differing perceptions about NIMART implementation.

Further research is needed to evaluate those clinics and districts which are considered 'successful' in order to better understand NIMART implementation. The behavioural nuances which enable some to embrace change and overcome challenges need to be better understood as this may inform the development of more sophisticated change management strategies that address resistance to change. On-going difficulties with referral processes indicate a need to develop and implement effective referral system strengthening interventions. One option, which some participants felt enhanced communication with up-referral sites, was the introduction of regular inter-facility meetings. This approach should be examined further to establish whether it does indeed improve relationships between staff and thus strengthen referral systems. Standardised written feedback forms, to be used when patients are referred back to their PHC facility, should also be developed and piloted to assess any positive impact on referral processes.

CONCLUSION

Despite the barriers to, and challenges of, NIMART, the overarching impression given by participants in this study is a positive one. In particular, whilst those who had recently started providing NIMART may have tended towards negativity, more experienced NIMART-nurses expressed greater optimism about the new programme, suggesting perhaps that perceptions may shift as clinical confidence grows.

Participants demonstrated an impressive capacity to overcome challenges and improve ART provision through determined innovation, creative problem solving, teamwork and positive attitudes. Targeted supportive interventions which meet the specific needs of facility-level implementers should now be implemented to enable them to continue providing quality NIMART services. Similarly, facilitators identified here need to be replicated across South Africa and other countries, harnessing their potential to ease healthcare providers' experience of change.

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Contributorship Statement

All three authors meet the ICMJE guidelines for authorship for this manuscript being submitted to BMJ Open for consideration for publication. All three (ND, MH, EV)

provided substantial contributions in terms of 1) conception and design, acquisition of data, or analysis and interpretation of data; 2) drafting the article or revising it critically for important intellectual content; and 3) final approval of the version to be published.

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TITLE PAGE

TITLE

Nurse and Manager Perceptions of Nurse Initiated and Managed Anti-Retroviral Therapy (NIMART) Implementation in South Africa: A Qualitative Study

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Key Words: HIV; antiretroviral therapy; South Africa; nurse-initiated-and-managed-ART (NIMART); task-shifting; qualitative research

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ABSTRACT

Objective: To explore nurse and facility and programme manager perceptions of nurse initiated and managed antiretroviral therapy (NIMART) implementation in Gauteng, South Africa

Design: In this qualitative study, in-depth interviews and focus group discussions were conducted to gain insight into participants' experiences of NIMART implementation.

Setting: Participants came from urban, peri-urban and rural primary health care clinics in two Gauteng Province municipalities.

Participants: 25 nurses and 18 managers who were actively involved in NIMART implementation were purposively sampled.

Results: Findings from this study reveal that, despite encountering numerous challenges including human resources,- training and clinical mentoring and health systems issues, NIMART-nurses and managers remained optimistic about their work. Study participants felt empowered by their expanded roles. Increased responsibilities associated with NIMART implementation encouraged better use of creative problem solving and teamwork to facilitate integration of NIMART into existing clinic services. NIMART-nurses perceived ART patients to be more insightful about their illness,- engaged in their HIV treatment and aware of the importance of adherence which enhanced nurse-patient relationships and increased their sense of job satisfaction.

Conclusion:

Although the implementation of NIMART is complex, when NIMART is implemented well, ART access is increased and patient outcomes are improved. Supportive interventions which address the specific challenges faced by nurses providing NIMART now need to be implemented. Attempts should be made to replicate the positive aspects of NIMART implementation identified by participants as this may improve healthcare providers' experiences of task-shifting.

ARTICLE SUMMARY

Article focus

- To explore nurse and facility/programme manager perceptions of NIMART implementation in South Africa
- To identify key challenges and facilitating factors which impact on the NIMART implementation process

Key Messages

- Despite facing many challenges, nurses and managers were overwhelmingly positive about the opportunity to provide NIMART
- Key challenges included human resources, training and clinical mentoring and health-systems issues.
- Important enabling factors included facility-level teamwork, creative problem solving, regular and effective inter-facility communication, effective referral pathways and access to telephonic mentoring support.

Strengths and limitations of this study

- Utilising qualitative methodologies to explore nurse and manager perceptions of NIMART implementation provides in-depth insights into the impact of task-shifting on facility-level staff.
- The study was conducted during the early stages of NIMART implementation in South Africa within a context of intense political pressure to succeed, which may have biased participant responses.

INTRODUCTION

The antiretroviral therapy (ART) programme in South Africa provides ART for over 2 million individuals infected with human immunodeficiency virus (HIV).[1] Based on 2010 World Health Organization (WHO) eligibility criteria, this equated to just 50% of qualifying individuals accessing treatment.[2] In late 2010, seeking faster programme expansion, South African public health policy switched from doctor-based, hospital-centric ART services to decentralised provision of nurse initiated and managed ART (NIMART).[3] Such task-shifting – delegating tasks to less specialised healthcare personnel – represents a key component of the WHO's public health approach to ART programme scale-up.[4] Implementation of task-shifting, including NIMART, in Rwanda,[5] Malawi,[6] Mozambique,[7] Lesotho [8] and smaller projects in South Africa [9, 10] has generated positive gains including earlier, faster patient enrolment; improved patient outcomes; greater acceptability and accessibility (particularly for rural populations); reduced patient transport costs and improved patient retention.

NIMART is a complex intervention intended to improve healthcare access and equity, ideally without compromising quality of care, in resource-limited settings.[11, 12] Optimal task-shifting requires well-resourced, multi-dimensional support including: health systems strengthening;[13] intensive staff engagement, training and mentoring;[14, 15, 16] redistributing basic tasks to non-clinical staff [17] and robust referral, drug supply and quality assurance systems.[18] South Africa's plan to rapidly implement NIMART on an unprecedented nationwide scale raised questions regarding its capacity to meet all of these requirements.[13] If poorly managed, NIMART implementation risks inadequately supported nurses providing sub-optimal care, negatively impacting patient outcomes, staff confidence, morale and broader healthcare services.[19, 20]

Although individual, social, patient and organisational challenges are known to hinder effective healthcare change,[21] whether these factors influence change within ART programmes in resource-constrained settings have been little studied.[22, 23] Qualitative research - crucial to furthering our understanding of change within healthcare contexts – remains particularly scarce.[24] During early ART roll-out in South Africa those studies exploring healthcare worker experiences identified several challenges including insufficient staffing, high staff turnover, unmanageable workloads and burnout and inadequate planning, emotional support, communication and responsiveness from senior management.[25-27] Healthcare workers' experiences of adapting to NIMART related task-shifting need exploration.[28] The authors investigated South Africa's NIMART implementation process from the perspective of NIMART-nurses and their managers.

METHODS

Study Population and Setting

The study was conducted in early 2011, shortly after South Africa began NIMART roll-out. Few facilities had begun the implementation process so study sites were selected if they had started implementing NIMART and had at least one NIMART-trained nurse. A mixture of urban, peri-urban and rural public primary healthcare (PHC) facilities from two municipalities (City of Johannesburg and Ekurhuleni) in Gauteng Province, South Africa was selected to ensure broad representation of facility types. Nurses (n=25, Table 1) from each site were then purposively sampled on the basis that they had completed requisite NIMART-training, although not all had begun initiating patients on ART. At facilities with more than one NIMART-trained nurse, all were invited to participate but typically, to avoid service delivery disruption, one nurse was released to attend the focus group discussion. Manager participants (n =18, Table 1) were invited to join the study if they were actively involved in NIMART implementation at one or more of the study sites. One nurse refused to participate and two senior managers were unable to attend their scheduled focus group. All participants were South African, one was Caucasian and five were male.

Table 1: Characteristics of Participants

Job Title (n)	Age in Years (Average)	Years in Nursing (Average)	Years as Manager (Average)
Facility Manager (8)	46-54 (49)	19-34 (25)	2-15 (8)
District/Regional Manager (3)	50-62 (55)	30-40 (35)	9-22 (14)
Senior Provincial Manager (3)	52-57 (55)	26-33 (30)	11-23 (15)
NGO Programme Manager (4, 2 Doctors)	35-55 (44)	20-27 (24)	1-8 (4)
NIMART-nurse already initiating (20)	32-63 (48)	4-39 (23)	n/a
NIMART-nurse trained, not yet initiating (5)	32-60 (49)	8-30 (22)	n/a

Three in-depth interviews (provincial manager, facility manager and NIMART-nurse), three nurse focus groups and two manager focus groups (six to ten participants each) were conducted, all in English. Clinically active nurses and facility/programme managers participated in separate groups to enable open discussion. Following telephonic recruitment, study participants provided written consent before participating in their allocated discussion. All interviews and focus group discussions, which were led by one researcher who utilised previously piloted interview and focus group guides, lasted

between sixty and ninety minutes. The researcher was supported by a note-taker where possible. In order to minimise bias during data collection, the researcher (a doctor and nurse-mentor employed by a supporting partner organisation) had no pre-existing relationship with any of the nurses included in the study. She had provided technical support to one of the facility managers prior to NIMART roll-out at that site. None of the other authors had pre-existing relationships with any of the study participants.

The University of Witwatersrand Human Research Ethics Committee granted ethics clearance (M10108) and Gauteng Department of Health approved the study.

Data Analysis

Audio recordings of interviews and focus groups were transcribed verbatim and transcripts were coded using NVivo 9 software, resulting in a framework of 84 narrowly defined codes. Coding was performed in stages, ensuring that the researcher became fully immersed in the data during multiple passes over each transcript. Using thematic content analysis, the 84 initial codes were consolidated into four key themes: human resources; training and clinical mentoring; communication and networking and infrastructural and support system issues. Co-authors reviewed random excerpts from all transcripts, confirming coding accuracy. The consistency of major themes was checked by comparing data from in-depth interviews and focus groups, from participants working in different municipalities and from nurses and managers.

RESULTS

During discussions participants identified numerous challenges which were perceived to be hindering NIMART as well as several key enablers which facilitated implementation. The four key themes which emerged during data analysis are presented here.

'You are alone as a sister…there's nobody helping you': Human Resources

Human resource issues heavily influenced participants' experiences of NIMART implementation. Although one senior provincial manager asserted that current staffing levels were adequate - '*you don't even need extra nurses for this [NIMART]*' - NIMART-nurses and facility and district managers expressed frustration and disappointment because extra human resources, perceived as essential, had not been forthcoming. Reporting widespread professional nurse shortages, nurses described '*struggling to cope with the workload*' as a result of their additional NIMART responsibilities. Integrating NIMART into existing PHC services heightened target-related performance pressures, which, in some facilitates, created an increasingly unpleasant working environment. For some participants, this triggered growing resentment because they perceived task-shifting

away from doctors as an 'abuse' of the role of nurses. As this 47 year old NIMART-nurse with 20 years of nursing experience relates:

> [NIMART is] a problem because we are only three [sisters]. We have ANC [antenatal care], child services, PHC, family planning, TB. All this basket of services to be rendered.

Nurse shortages were reported as being compounded by underrepresentation of lower cadres of healthcare worker. This left managers unable to delegate administrative and basic clinic tasks to 'down-stream' staff. One regional manager described how widespread shortages of enrolled nurses, nursing assistants, data collectors and counsellors precluded what was, to her understanding, true task-shifting. She concluded that *'…as a nurse, you are everything… Jack of all trades'*. Considering nurses take '*up to an hour to initiate one ART-patient*', she noted that the inability to shift basic tasks away from nurses undermined the quality of care provided to the patient, prevented nurses from seeing sufficient numbers of ART-patients and lengthened waiting times for other patient groups. Additionally, important administrative activities, including maintaining patient registers and pharmacy records, were described as *'fall[ing] by the wayside'*. One facility manager, from a busy Johannesburg clinic, voiced her concerns:

> [The nurses] are so pressured, working right up to or past four o'clock. They don't have time to get their rooms in order or replenish medication. The poor

> nurses are on a fast train to I don't know where! They're just rushing and rushing – they're gonna make mistakes!

This tension between trying to meet performance targets including shorter waiting-times and higher patient turnover, whilst simultaneously striving to provide time-consuming, individualised care was raised by many participants. One regional manager asked:

> Are we looking at quality or quantity? NIMART is a very, very sensitive programme. We end up with patients defaulting because you don't have time for them - you are chasing the waiting-time target.

Despite human resource shortages, staff attitudes towards NIMART remained overwhelmingly positive. In particular, those whose relatives had died whilst awaiting doctor-led ART initiation were enthusiastic and considered NIMART '*long overdue'*. Others found relief in providing continuity of care and initiating their own patients rather than knowing patients were waiting to initiate treatment at up-referral sites. Those familiar with preparing patients for doctor initiation and managing stable ART-patients talked about feeling ready and being 'excited' about the new responsibility, as this nurse explains:

> I was really very excited to do NIMART…it was unnecessary for me to send patients [away] whereas I can initiate myself. I was a little worried about side-effects but I was not at all scared. I told myself these things I've been exposed to

a long time.

The implementation process was particularly influenced by facility manager attitudes, as illustrated by this facility manager's description of her approach to NIMART:

> I'm somebody very different, receptive to anything. I'm saying to others who are still very negative that they should open their eyes and have some open mind. We need to open our clinics, even if they are small - even if it can be in the foyer - as long as patients get treatment. We need to do this!

Where facility managers such as the one cited above were flexible, took pride in their facility and sought to improve standards; clinic staff were described as happier, more enthusiastic and hardworking and displaying greater capacity to cope with and adapt to new roles and responsibilities. As one younger nurse described, such positive attitudes proved contagious, and drew additional staff into the NIMART programme which created a strong, supportive team able to provide an improved service:

> I just went to see [the NIMART service] and then I thought 'wow, this is so interesting!' I think [my manager] loves working with HIV patients. So I said 'ok, let me sit, let me listen' and then I got this thing that 'ok, I can do this if the other sister can'. Wow! I was so excited. We support each other very much - even if you feel there's pressure, there's somebody next to you who will grab you and say 'let's do it'… Teamwork is very important.

Where a supportive, team-oriented culture prevailed, staff appeared more resilient to change-related pressures and morale seemed higher, whereas in facilities with an individualistic ethos, negative experiences were more common. This participant, who was the only NIMART-nurse at her facility, described feeling unsupported by nursing colleagues:

> [My colleagues] always say 'no, we're not trained'. They were just piling everything for me. When I went on leave clients were not given [ART] treatment. The first day I came back [colleagues said] 'we're so long waiting for you!' Then I turned my back, I said 'no, I'm not doing it. Somebody must take over. It's not my job - it's everybody's job!'

Contrastingly, nurses working within well-established teams described improvising and working together to overcome barriers to NIMART implementation:

> …space is a challenge but we improvise because our clinic is very hectic. I said 'you have to be flexible...just find a corner'. We did some partitioning so we could do counselling [and improve] the patient flow. I was fortunate; people were very flexible and hard-working.

Alongside effective teamwork, positive experiences of caring for ART-patients also engendered more supportive staff attitudes. Nurses reported that ART-patients tend to be

more insightful about their illness; more engaged in their management and more aware of the importance of treatment adherence compared to other patient groups. This NIMART-nurse, from a small peri-urban site, described her enjoyment of working with ART-patients:

> It's very nice to initiate patients on ART. You get to know the patients deeper. You talk about side-effects, the CD4 count. You feel like 'I'm building a relationship between me and this patient'. The patient gets confidence in you, they will tell you 'Sister, I've got sores in my mouth and I'm worried – what do you think?' They will be specific.

Others shared about the satisfaction they derived from playing a key role in their patients' recovery. Rather than losing track of patients following up-referral, nurses were now witnessing patients, including terminally ill individuals, rapidly improving on treatment. Tangibly impacting patients' lives incentivised nurses and boosted morale:

> The relationship I build with patients, it's nice. You can see if your patient is progressing well or if the condition is deteriorating. I'm doing PMTCT [prevention of mother-to-child transmission] so you make that relationship, the patient delivers, you follow-up the baby. It's nice if the baby is negative.

These positive experiences led participants to persuade other colleagues to become NIMART-nurses. They wanted their peers to experience the satisfaction of providing life-changing care.

***'I'm not yet ready [to initiate]…I still have hiccups…I need support':* Training and Clinical Mentoring**

Non-governmental organisation (NGO) programme managers, who were partnering with Department of Health (DoH) to support NIMART implementation, shared the difficulties created by '*rolling out the service and* then *capacitating the nurses'*. DoH pressure to implement NIMART quickly often resulted in poorly co-ordinated NGO-supported training activities.

Although nurses who attended off-site training described it as comprehensive and informative they criticised managers for haphazard coordination and inappropriate staff selection. In some facilities nurses who were '*not interested in NIMART*' undermined programme sustainability by refusing to attend training. Several nurses described the difficulties created by having only one trained nurse at their facility:

> [Managers] don't care how many nurses have undergone training and some nurses are reluctant to go for training and start this initiation thing so if you go for training maybe you are the only one. All the HIV patients they'll be saying

> 'it's your patients, this is your problem, take them to sister X' - now it becomes my problem - it was really tough.

One district manager responded to inconsistent training coverage by instituting facility-by-facility on-site training. This approach ensured *'everybody in the clinic becomes trained and feel[s] comfortable with initiation through group mentorship'*. Fellow managers responded enthusiastically to this model:

> That's very good. If [trainers] come to the clinic they face the reality there. Normally, with training, they use an ideal situation then you come back down to earth with a hard bump. Also it helps many more people get trained rather than taking one person out at a moment. I would really like it, I'm very excited. I wish we could follow that!

Supporting partners' limited capacity to provide follow-up mentoring and conduct competency assessments for trained nurses was also identified as a challenge. Consequently, several nurses described providing NIMART before they felt confident enough to do so and reported feeling concerned because they were *'learning as we are going on'* and '*taking chances'*:

> It was a bit unfair for [NIMART] to be introduced in that fashion because there was no in-service training, there was nothing given. We were dish-upping the

medication just like that and, as time went by, we discovered so many things that we did wrong.

Many experienced uncertainty when interpreting abnormal laboratory results, managing complex co-morbidities or ART-associated adverse events. One 58 year old nurse based at a small, peri-urban facility, described how uncertain she felt during her first unsupervised ART initiation:

> At first it was scary - I was a little bit jittery because I was on my own. I had mentoring for about a week but when I took over, eh! I started shivering. I prayed: 'God, help me to go through this thing, I can't go alone on this journey'

Conversely, other nurses described receiving support from mentors who were *'just a phone call away'*. Such telephonic support proved crucial as it enabled these nurses to gain confidence gradually despite minimal on-site mentorship, and provided essential opportunity for debriefing. Debriefing enabled nurses to re-engage with NIMART after a patient death had affected their self-confidence:

> I remember this patient I initiated [who] died. I felt bad...very bad. I thought 'no, this [NIMART] is just not for me.' I had that guilty feeling until [my mentor] scrutinised the file and reassured me: 'no, you did everything that you could, it's not your fault, you were saving a life, you did nothing wrong' so, at least I was a little bit better but sometimes you feel people will think you are killing

patients.

In contrast, at facilities without telephones, or where up-referral site doctors were *'refusing to come on board'* as mentors, inexperienced nurses described feeling isolated. The inadequate feedback provided by up-referral sites when patients returned to their original PHC facility also left nurses discouraged due to the lost opportunity for skills-transfer. Doctors were perceived as failing to recognise nurses as '*human beings [who] really want to communicate with human beings'*. As this 54 year old NIMART-nurse explains:

> I think [doctors] don't understand the importance of the report back. It is a learning tool for a sister so that next time, when you get a patient like this, you know what to do. If they don't send us report how are we going to learn? Because we are not doctors, we are nurses.

In some facilities where mentorship from supporting partners or up-referral site doctors was lacking, informal 'in-house' mentoring - provided by more experienced NIMART-nurses - emerged as an invaluable means to capacity-build newly trained colleagues. One experienced NIMART-nurse described the impact her 'in-house' mentoring had on programme sustainability at her facility:

> I started alone here as a NIMART-nurse. Now two other [trained] sisters are being mentored by me. They are coming very well. The facility staff

worried because if I'm away what will the clinic do? So now, at least, if I'm away these two sisters are here.

These 'nurse-mentors' represented a highly acceptable and much needed alternative source of clinical support. One NGO programme manager, facing limited mentoring capacity within her organisation, concluded: '*in terms of sustainability, nurses who are competent have to start to mentor their own colleagues'*.

***"Communication is one way down, they tell us what to do….we don't have a say"*: Communication, Consultation and Networking**

Research participants shared how the DoH's approach to change management had created anger and confusion amongst some staff. Following minimal consultation, they were unhappy that *'the [NIMART] programme is failing because we are not involved in planning'*.

Facility managers also expressed dissatisfaction regarding 'readiness assessments', during which senior managers conducted site visits to establish a facility's capacity to provide NIMART. These visits were perceived as '*just an exercise'* which provided limited opportunities for staff to communicate their perceived needs and concerns. Several participants were clearly angered by their assessment experience:

> The assessor said: 'It's not ideal but start anyway!' It's not like you are really OK to do this, but start! These words we hear a lot with our managers: 'Do whatever you can with what we have.' I just want to die when I hear that because that's not good enough for me!

Effective communication between facility-level staff often ameliorated the frustration arising from inadequate communication between senior management and ground-level staff. Inter-facility networking provided a vital opportunity to encourage others and iron-out programmatic issues. For nurses, regular case-based training meetings increased their knowledge and confidence and allowed isolated NIMART-nurses, such as those cited above, to debrief with understanding peers. For facility-managers, meeting other managers to share skills, ideas, frustrations and experiences assisted with problem solving.

Regular meetings between PHC facilities and up-referral hospital staff also facilitated NIMART implementation by improving communication, addressing referral pathway weaknesses and building more supportive inter-collegial relationships. In areas without regular inter-facility meetings, these relationships remained strained, often resulting in patients being unnecessarily sent between various facilities due to poor communication, as this nurse explains:

> [The up-referral sites] chase patients away. If that patient has a letter from the clinic they know that for the sister to refer means that they're stuck. We were

> told 'if you don't know the diagnosis send them to the hospital'. Really, phoning, I don't accept it - why must we pamper [the doctors] by phoning [first]?

Communication is vital to the success of any health programme, including NIMART. Inadequate staff consultation during planning impacted staff morale and hindered their capacity to fully implement NIMART. Contrastingly, effective communication and positive interactions between different levels of care became a critical component for task-shifting success.

'These little hovels….it's disgraceful, really!': Infrastructure, Support Systems and Innovative Integration Models

Challenges associated with infrastructural shortcomings were ubiquitous, even before NIMART rollout began, but were often compounded as clinics began dealing with increasing numbers of ART patients. Staff at clinics with limited space described how they were *'no longer coping with the number of patient[s]',* additional stock and extra services. These infrastructural constraints impacted morale; compromised staff health and affected clinic efficiency. Poor infrastructure also undermined NIMART-nurses' capacities~~y~~ to safeguard patient confidentiality during consultations. One nurse shared her distress about the situation at her facility:

> It's not nice. I want to talk about issues - the patient cannot speak loud because there's no space - we are dividing with cupboards or a curtain in one room so we can see four patients at each corner, which is not right.

Participants also identified various other systems related challenges including: limited access to off-site investigations such as chest x-rays; cumbersome data collection processes which kept '*changing like petticoats*', out-dated telecommunications systems, fragmented patient transport services and complicated drug ordering processes. One busy inner-city clinic manager described her current situation:

> …now I don't have [ART] medication because when we order it's such a process. I'm going to take from another site, say[ing] 'give me about three packs and when I get my stock I'll give you three back'. It's all about starting [patients] - nobody cares whether the systems are in place.

However, some participants described how creative problem solving at facility level eased NIMART integration, successfully addressing many implementation challenges whilst minimising disruption to other PHC services. NIMART implementation appeared to empower these nurses as it allowed them to develop systems which worked for them. They reported increased job satisfaction and lower levels of concern about staff burnout and unmanageable stress.

Two such integration models particularly captured other participants' imagination when shared during the group discussions. One clinic established an internal up and down-referral system within which time-consuming ART-initiation patients were managed by the NIMART-nurse. On a rotational basis, every nurse operated as 'NIMART-nurse' for one week. Once stable, ART-patients were 'down-referred' within the clinic to the general PHC nurses who '*kept the chronics* [diabetic/hypertensive patients] *queue moving*'. Thus the NIMART-nurse had more time to spend with complex patients whilst well patients could be seen quickly. Stable ART-patients benefited from 'down-referral' because queuing with other 'chronic' patients protected their confidentiality and reduced waiting times. Additionally, as explained by the facility manager, the regular rotation ensured all nurses became NIMART providers, thus strengthening programme sustainability:

> [Nurses] rotate so that they know everything. I don't get paralyzed when one sister is not on duty and she's specialising in that role. Three to four people are rotating: ANC, tuberculosis, wellness programme, chronics, ARVs.

Another smaller clinic, with just one NIMART-nurse, was now '*reserving Fridays for initiations'* so that he could spend sufficient time preparing these patients.

Thus, although infrastructural shortcomings threatened to undermine NIMART success at many sites, some facility managers demonstrated remarkable innovation, adapting integration models to overcome staffing and space constraints whilst minimising

disruption to existing services. For many participants, NIMART implementation was perceived as empowering as it enabled them to develop and use systems that worked within their local context.

DISCUSSION

NIMART implementation is a complex health intervention. The experiences described above reflect key challenges and enabling factors which influence the quality of NIMART services provision. Despite the challenges, many managers and NIMART-nurses experienced providing antiretroviral therapy to their patients very positively; this was enhanced with structural and management support.

Human resource shortages are a well-recognised hindrance to rapid ART programme expansion. Considering 40% of nursing posts in South Africa lie vacant [29] and up to 50% of nursing time is consumed by administrative tasks,[30, 31] concerns regarding over-dependence on nurse-based task-shifting for ART scale-up appear well founded.[13] The importance of expanding lower cadre staff complements to perform basic tasks, traditionally assigned to nurses, has been stressed elsewhere.[8, 17] This study highlights the sustainability issues created when task-shifting to nurses is undertaken without providing sufficient 'down-stream' staff. Realistic, standardised 'down-stream' staffing levels and revised scopes of practice should be developed and universally

implemented.[12] Where resource constraints preclude provision of additional clinical staff, data capturers, administrative clerks, nursing auxiliaries and community healthcare workers – who require shorter training and lower remuneration - represent a vital means of improving health service efficiency and sustainability.[12] Importantly, however, facility managers also need to be better capacitated and motivated to effectively manage existing staff complements and optimally task-shift so that everyone performs appropriate duties.[32]

Quality, safe task-shifting inarguably relies on comprehensive training, mentoring and on-going quality assurance.[5, 33] Unfortunately, in this study, NIMART-nurses and managers reported that hasty NIMART implementation had seriously compromised access to these crucial capacity-building interventions. This undermined individual nurses' confidence and left many facilities with an unsustainable NIMART programme where only one nurse had been trained. Providing on-site NIMART training to several nurses at a facility – as was happening in one district – would address this common problem. Importantly, despite these difficulties, participants remained optimistic and identified two further practical interventions which may mitigate this situation. Firstly, a shift is needed towards fast-tracking nurse-mentor development in which experienced NIMART-nurses need to be equipped to supervise, support and train colleagues at their own and nearby facilities. Secondly, nurses require reliable access to telephonic support, perhaps through greater involvement of doctors at up-referral sites. These interventions might also address the emotional support and debriefing needs of nurses caring for

patients with advanced disease, something which should not be under-estimated in a context such as South Africa.[34]

Effective inter-facility communication, mutual support, teamwork and the use of creative problem solving at the facility-level were all important factors in enabling the successful implementation of NIMART. Several ~~theoretical~~ benefits of teamwork [15] were described by participants working in 'happy' clinics where NIMART appeared to cause less disruption, stress and discontent. A culture of teamwork and innovative problem-solving ~~needs to~~ should be nurtured to better enable nurses and their managers to deal with NIMART implementation. Establishment and support of quality improvement teams within facilities may be one means of strengthening this area ~~particularly at poorly performing facilities, to better enable nurses and their managers to deal with NIMART implementation.~~

The human resource and infrastructural constraints described in this study echo problems widely recognised as hindering ART-programme expansion in resource-limited settings.[35, 36] Although NIMART can effectively expand ART access it also continues to restrict service provision to increasingly overcrowded fixed facilities operating with limited human resources. Therefore, implementation of NIMART in isolation will likely fail to address the long-term sustainability of South Africa's ART programme.[37] Task-shifting to nurses represents just one facet of decentralisation and there remains a need to look beyond traditional PHC facility-based services towards chronic care models which involve patients in self-management and community support. Shifting the care of healthy,

stable ART-patients out of fixed facilities has been shown to further improve patient outcomes and reduce reliance on overstretched health services, releasing healthcare workers to spend more time and effort on the sick and on improving long term patient retention.[38-41] Although South Africa is now implementing a new primary healthcare model in which community healthcare workers will provide health promotion and prevention interventions at community and household levels,[42] future national health policies may need to go even further, engaging patients with any chronic condition (HIV, diabetes, hypertension) in self-management and utilising them as community healthcare workers, peer educators, lay counsellors and expert patients who provide community-based patient support.[43, 44]

Limitations and Future Research

This study took place early during South Africa's NIMART implementation process, when few nurses had started initiating ART and there was still much uncertainty about the programme. A follow-up study, once NIMART is firmly established in more facilities across South Africa, may shed light concerning healthcare providers' longer term adaptation to changing roles. The study was undertaken in an environment of intense political pressure to make NIMART succeed, which may have influenced participant responses. There is limited rural representation and those working in rural facilities may have differing perceptions about NIMART implementation.

Further research is needed to evaluate those clinics and districts which are considered 'successful' in order to better understand NIMART implementation. The behavioural nuances which enable some to embrace change and overcome challenges need to be better understood as this may inform the development of more sophisticated change management strategies that address resistance to change. On-going difficulties with referral processes indicate a need to develop and implement effective referral system strengthening interventions. One option, which some participants felt enhanced communication with up-referral sites, was the introduction of regular inter-facility meetings. This approach should be examined further to establish whether it does indeed improve relationships between staff and thus strengthen referral systems. Standardised written feedback forms, to be used when patients are referred back to their PHC facility, should also be developed and piloted to assess any positive impact on referral processes.

CONCLUSION

Despite the barriers to, and challenges of, NIMART, the overarching impression given by participants in this study is a positive one. In particular, whilst those who had recently started providing NIMART may have tended towards negativity, more experienced NIMART-nurses expressed greater optimism about the new programme, suggesting perhaps that perceptions may shift as clinical confidence grows.

Participants demonstrated an impressive capacity to overcome challenges and improve ART provision through determined innovation, creative problem solving, teamwork and positive attitudes. Targeted supportive interventions which meet the specific needs of facility-level implementers should now be implemented to enable them to continue providing quality NIMART services. Similarly, facilitators identified here need to be replicated across South Africa and other countries, harnessing their potential to ease healthcare providers' experience of change.

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COREQ Checklist for Manuscript Submission: Nurse and Manager Perceptions of Nurse Initiated and Managed Anti-Retroviral Therapy (NIMART) Implementation in South Africa: A Qualitative Study

No. Item	Guide questions/description	Answer
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Inter viewer/facilitator	Which author/s conducted the interview or focus group?	ND
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	MBChB, MPH
3. Occupation	What was their occupation at the time of the study?	Medical Doctor & nurse mentor
4. Gender	Was the researcher male or female?	Female
5. Experience and training	What experience or training did the researcher have?	Qualitative techniques training during MPH degree & NVivo 9 course completed
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	No relationship with nurse participants. Prior relationship with one facility manager.
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	ND introduced herself at the beginning of each FGD/IDI and explained the reasoning for the research
8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Doctor working for supporting organization with nurse mentoring experience and involvement in NIMART implementation.
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content	Content analysis

	analysis	
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Purposive
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Telephone
12. Sample size	How many participants were in the study?	43
13. Non-participation	How many people refused to participate or dropped out? Reasons?	1 nurse refused, 2 senior managers missed their scheduled groups
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	FGDs conducted at central clinics for ease of participant travel. IDIs conducted at participants workplaces
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	Note taker was present when available.
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Demographic data included in Table 1 within manuscript
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Interview and focus group guide piloted and utilized for all data collection
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	No
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Audio
20. Field notes	Were field notes made during and/or after the inter view or focus group?	Field notes were made during and after data collection
21. Duration	What was the duration of the inter views or focus group?	60 – 90 minutes
22. Data saturation	Was data saturation discussed?	Data saturation was considered reached based on no new themes arising by the end of analysis of all data.
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Due to time constraints this was not done.
Domain 3: analysis and findings		

Data analysis		
24. Number of data coders	How many data coders coded the data?	ND coded all the data. EV and MH conducted spot checks to ensure consistency and agreement.
25. Description of the coding tree	Did authors provide a description of the coding tree?	Yes
26. Derivation of themes	Were themes identified in advance or derived from the data?	Derived from data
27. Software	What software, if applicable, was used to manage the data?	NVivo 9
28. Participant checking	Did participants provide feedback on the findings?	Due to time constraints participant feedback was not sought.
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Yes. Participants were described based on their demographics including site they worked at or years of experience.
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Yes
31. Clarity of major themes	Were major themes clearly presented in the findings?	Yes
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Due to limited word count in the manuscript this is only briefly touched upon