



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

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10 4 Nurse and Manager Perceptions of Nurse Initiated and Managed Anti-Retroviral Therapy  
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12 (NIMART) Implementation in South Africa: A Qualitative Study  
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45 2 **ABSTRACT**  
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10 4 **Objective:** To explore nurse and facility and programme manager perceptions of nurse  
11 initiated and managed antiretroviral therapy (NIMART) implementation in Gauteng,  
12 South Africa  
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17 7 **Design:** In this qualitative study, in-depth interviews and focus group discussions were  
18 conducted to gain insight into participants' experiences of NIMART implementation.  
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20 8  
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22 9 **Setting:** Participants came from urban, peri-urban and rural primary health care clinics in  
23 two Gauteng Province municipalities.  
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25 10  
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27 11 **Participants:** 25 nurses and 18 managers who were actively involved in NIMART  
28 implementation were purposively sampled.  
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30 12  
31  
32 13 **Results:** Findings from this study reveal that, despite encountering numerous challenges  
33 including human resources; training and clinical mentoring and health systems issues,  
34 NIMART-nurses and managers remained optimistic about their work. Study participants  
35 felt empowered by their expanded roles. Increased responsibilities associated with  
36 NIMART implementation encouraged better use of creative problem solving and  
37 teamwork to facilitate integration of NIMART into existing clinic services. NIMART-  
38 nurses perceived ART patients to be more insightful about their illness; engaged in their  
39 HIV treatment and aware of the importance of adherence which enhanced nurse-patient  
40 relationships and increased their sense of job satisfaction.  
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53 22 **Conclusion:**  
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1 NIMART implementation is complex, but if implemented well, increases ART access  
2 and improves patient outcomes. Supportive interventions which address the specific  
3 challenges faced by nurses providing NIMART now need to be implemented. Attempts  
4 should be made to replicate the positive aspects of NIMART implementation identified  
5 by participants as this may improve healthcare providers' experiences of task-shifting.  
6

## 7 **ARTICLE SUMMARY**

### 8 **Article focus**

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

### 13 **Key Messages**

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

### 21 **Strengths and limitations of this study**

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- 4 1 • Utilising qualitative methodologies to explore nurse and manager perceptions of
- 5
- 6 2 NIMART implementation provides in-depth insights into the impact of task-
- 7
- 8 3 shifting on facility-level staff.
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- 10
- 11 4 • The study was conducted during the early stages of NIMART implementation in
- 12
- 13 5 South Africa within a context of intense political pressure to succeed, which may
- 14
- 15 6 have biased participant responses.
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## 22 9 INTRODUCTION

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27 11 The antiretroviral therapy (ART) programme in South Africa provides ART for over 2

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29 12 million individuals infected with human immunodeficiency virus (HIV).[1] Based on

30

31 13 2010 World Health Organization (WHO) eligibility criteria, this equated to just 50% of

32

33 14 qualifying individuals accessing treatment.[2] In late 2010, seeking faster programme

34

35 15 expansion, South African public health policy switched from doctor-based, hospital-

36

37 16 centric ART services to decentralised provision of nurse initiated and managed ART

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39 17 (NIMART).[3] Such task-shifting – delegating tasks to less specialized healthcare

40

41 18 personnel – represents a key component of the WHO’s public health approach to ART

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43 19 programme scale-up.[4] Implementation of task-shifting, including NIMART, in

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45 20 Rwanda,[5] Malawi,[6] Mozambique,[7] Lesotho [8] and smaller projects in South Africa

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47 21 [9, 10] has generated positive gains including earlier, faster patient enrolment; improved

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49 22 patient outcomes; greater acceptability and accessibility (particularly for rural

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51 23 populations); reduced patient transport costs and improved patient retention.

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5 2 NIMART is a complex intervention intended to improve healthcare access and equity,  
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8 3 ideally without compromising quality of care, in resource-limited settings.[11, 12]  
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10 4 Optimal task-shifting requires well-resourced, multi-dimensional support including:  
11  
12 5 health systems strengthening;[13] intensive staff engagement, training and mentoring;[14,  
13  
14 15, 16] redistributing basic tasks to non-clinical staff [17] and robust referral, drug supply  
15  
16 17 and quality assurance systems.[18] South Africa's plan to rapidly implement NIMART  
17  
18 18 on an unprecedented nationwide scale raised questions regarding its capacity to meet all  
19  
20 19 of these requirements.[13] If poorly managed, NIMART implementation risks  
21  
22 20 inadequately supported nurses providing sub-optimal care, negatively impacting patient  
23  
24 21 outcomes, staff confidence, morale and broader healthcare services.[19, 20]  
25  
26 22  
27 23 Although individual, social, patient and organisational challenges are known to hinder  
28  
29 24 effective healthcare change,[21] whether these factors influence change within ART  
30  
31 25 programmes in resource-constrained settings have been little studied.[22, 23] Qualitative  
32  
33 26 research - crucial to furthering our understanding of change within healthcare contexts –  
34  
35 27 remains particularly scarce.[24] During early ART roll-out in South Africa those studies  
36  
37 28 exploring healthcare worker experiences identified several challenges including  
38  
39 29 insufficient staffing, high staff turnover, unmanageable workloads and burnout and  
40  
41 30 inadequate planning, emotional support, communication and responsiveness from senior  
42  
43 31 management.[25-27] Healthcare workers' experiences of adapting to NIMART related  
44  
45 32 task-shifting need exploration.[28] The authors investigated South Africa's NIMART  
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47 33 implementation process from the perspective of NIMART-nurses and their managers.  
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3 **METHODS**

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5 **Study Population and Setting**

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

12

13 **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

1  
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5 2 Audio recordings of interviews and focus groups were transcribed verbatim and  
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8 3 transcripts were coded using NVivo 9 software, resulting in a framework of 84 narrowly  
9  
10 4 defined codes. Coding was performed in stages, ensuring the researcher became fully  
11  
12 5 immersed in the data during multiple passes over each transcript. Using thematic content  
13  
14 6 analysis, the 84 initial codes were consolidated into four key themes: human resources;  
15  
16 7 training and clinical mentoring; communication and networking and infrastructural and  
17  
18 8 support system issues. Co-authors reviewed random excerpts from all transcripts,  
19  
20 9 confirming coding accuracy. The consistency of major themes was checked by  
21  
22 10 comparing data from in-depth interviews and focus groups, from participants working in  
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24 11 different municipalities and from nurses and managers.  
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## 16 RESULTS

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18 During discussions participants identified numerous challenges which were perceived to  
19 be hindering NIMART as well as several key enablers which facilitated implementation.

20 The four key themes which emerged during data analysis are presented here.

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23 *'You are alone as a sister...there's nobody helping you': Human Resources*

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5 2 Human resource issues heavily influenced participants' experiences of NIMART  
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8 3 implementation. Although one senior provincial manager asserted that current staffing  
9  
10 4 levels were adequate - '*you don't even need extra nurses for this [NIMART]*' - NIMART-  
11  
12 5 nurses and facility and district managers expressed frustration and disappointment  
13  
14 6 because extra human resources, perceived as essential, had not been forthcoming.  
15  
16  
17 7 Reporting widespread professional nurse shortages, nurses described '*struggling to cope*  
18  
19 8 *with the workload*' as a result of their additional NIMART responsibilities. Integrating  
20  
21 9 NIMART into existing PHC services heightened target-related performance pressures,  
22  
23 10 which, in some facilitates, created an increasingly unpleasant working environment. For  
24  
25 11 some participants, this triggered growing resentment because they perceived task-shifting  
26  
27 12 away from doctors as an 'abuse' of the role of nurses. As this 47 year old NIMART-nurse  
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29 13 with 20 years of nursing experience relates:

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36 15 [NIMART is] a problem because we are only three [sisters]. We have ANC  
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38 16 [antenatal care], child services, PHC, family planning, TB. All this basket of  
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40 17 services to be rendered.  
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46 19 Nurse shortages were reported as being compounded by underrepresentation of lower  
47  
48 20 cadres of healthcare worker. This left managers unable to delegate administrative and  
49  
50 21 basic clinic tasks to 'down-stream' staff. One regional manager described how  
51  
52 22 widespread shortages of enrolled nurses, nursing assistants, data collectors and  
53  
54 23 counsellors precluded what was, to her understanding, true task-shifting. She concluded  
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1 that '*...as a nurse, you are everything... Jack of all trades*'. Considering nurses take '*up*  
2 *to an hour to initiate one ART-patient*', she noted that the inability to shift basic tasks  
3 away from nurses undermined the quality of care provided to the patient, prevented  
4 nurses from seeing sufficient numbers of ART-patients and lengthened waiting times for  
5 other patient groups. Additionally, important administrative activities, including  
6 maintaining patient registers and pharmacy records, were described as '*fall[ing] by the*  
7 *wayside*'. One facility manager, from a busy Johannesburg clinic, voiced her concerns:

8  
9 [The nurses] are so pressured, working right up to or past four o'clock. They  
10 don't have time to get their rooms in order or replenish medication. The poor  
11 nurses are on a fast train to I don't know where! They're just rushing and  
12 rushing – they're gonna make mistakes!

13  
14 This tension between trying to meet performance targets including shorter waiting-times  
15 and higher patient turnover, whilst simultaneously striving to provide time-consuming,  
16 individualized care was raised by many participants. One regional manager asked:

17  
18 Are we looking at quality or quantity? NIMART is a very, very sensitive  
19 programme. We end up with patients defaulting because you don't have time for  
20 them - you are chasing the waiting-time target.

21  
22 Despite human resource shortages, staff attitudes towards NIMART remained  
23 overwhelmingly positive. In particular, those whose relatives had died whilst awaiting

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

7  
8 I was really very excited to do NIMART...it was unnecessary for me to send  
9 patients [away] whereas I can initiate myself. I was a little worried about side-  
10 effects but I was not at all scared. I told myself these things I've been exposed to  
11 a long time.

12  
13 The implementation process was particularly influenced by facility manager attitudes, as  
14 illustrated by this facility manager's description of her approach to NIMART:

15  
16 I'm somebody very different, receptive to anything. I'm saying to others who  
17 are still very negative that they should open their eyes and have some open  
18 mind. We need to open our clinics, even if they are small - even if it can be in  
19 the foyer - as long as patients get treatment. We need to do this!

20  
21 Where facility managers such as the one cited above were flexible, took pride in their  
22 facility and sought to improve standards; clinic staff were described as happier, more  
23 enthusiastic and hardworking and displaying greater capacity to cope with and adapt to

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

4  
5 I just went to see [the NIMART service] and then I thought ‘wow, this is so  
6 interesting!’ I think [my manager] loves working with HIV patients. So I said  
7 ‘ok, let me sit, let me listen’ and then I got this thing that ‘ok, I can do this if the  
8 other sister can’. Wow! I was so excited. We support each other very much -  
9 even if you feel there’s pressure, there’s somebody next to you who will grab  
10 you and say ‘let’s do it’... Teamwork is very important.

11  
12 Where a supportive, team-oriented culture prevailed, staff appeared more resilient to  
13 change-related pressures and morale seemed higher, whereas in facilities with an  
14 individualistic ethos, negative experiences were more common. This participant, who  
15 was the only NIMART-nurse at her facility, described feeling unsupported by nursing  
16 colleagues:

17  
18 [My colleagues] always say ‘no, we’re not trained’. They were just piling  
19 everything for me. When I went on leave clients were not given [ART]  
20 treatment. The first day I came back [colleagues said] ‘we’re so long waiting for  
21 you!’ Then I turned my back, I said ‘no, I’m not doing it. Somebody must take  
22 over. It’s not my job - it’s everybody’s job!’

23

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3 1 Contrastingly, nurses working within well-established teams described improvising and  
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6 2 working together to overcome barriers to NIMART implementation:  
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10 3  
11 4 ...space is a challenge but we improvise because our clinic is very hectic. I said  
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13 5 'you have to be flexible...just find a corner'. We did some partitioning so we  
14  
15 6 could do counselling [and improve] the patient flow. I was fortunate; people  
16  
17 7 were very flexible and hard-working.  
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22 9 Alongside effective teamwork, positive experiences of caring for ART-patients also  
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24 10 engendered more supportive staff attitudes. Nurses reported that ART-patients tend to be  
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26 11 more insightful about their illness; more engaged in their management and more aware of  
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28 12 the importance of treatment adherence compared to other patient groups. This NIMART-  
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30 13 nurse, from a small peri-urban site, described her enjoyment of working with ART-  
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32 14 patients:  
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38 16 It's very nice to initiate patients on ART. You get to know the patients deeper.  
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40 17 You talk about side-effects, the CD4 count. You feel like 'I'm building a  
41  
42 18 relationship between me and this patient'. The patient gets confidence in you,  
43  
44 19 they will tell you 'Sister, I've got sores in my mouth and I'm worried – what do  
45  
46 20 you think?' They will be specific.  
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51 21  
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53 22 Others shared about the satisfaction they derived from playing a key role in their patients'  
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55 23 recovery. Rather than losing track of patients following up-referral, nurses were now  
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1 witnessing patients, including terminally ill individuals, rapidly improving on treatment.

2 Tangibly impacting patients' lives incentivised nurses and boosted morale:

3

4 The relationship I build with patients, it's nice. You can see if your patient is

5 progressing well or if the condition is deteriorating. I'm doing PMTCT

6 [prevention of mother-to-child transmission] so you make that relationship, the

7 patient delivers, you follow-up the baby. It's nice if the baby is negative.

8

9 These positive experiences led participants to persuade other colleagues to become

10 NIMART-nurses. They wanted their peers to experience the satisfaction of providing life-

11 changing care.

12

13

14 ***'I'm not yet ready [to initiate]...I still have hiccups...I need support': Training and***

15 **Clinical Mentoring**

16

17 Non-governmental organisation (NGO) programme managers, who were partnering with

18 Department of Health (DoH) to support NIMART implementation, shared the difficulties

19 created by '*rolling out the service and then capacitating the nurses*'. DoH pressure to

20 implement NIMART quickly often resulted in poorly co-ordinated NGO-supported

21 training activities.

22



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3 1 Although nurses who attended off-site training described it as comprehensive and  
4  
5 2 informative they criticised managers for haphazard coordination and inappropriate staff  
6  
7 3 selection. In some facilities nurses who were '*not interested in NIMART*' undermined  
8  
9 4 programme sustainability by refusing to attend training. Several nurses described the  
10  
11 5 difficulties created by having only one trained nurse at their facility:  
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18 [Managers] don't care how many nurses have undergone training and some  
19  
20 8 nurses are reluctant to go for training and start this initiation thing so if you go  
21  
22 9 for training maybe you are the only one. All the HIV patients they'll be saying  
23  
24 10 'it's your patients, this is your problem, take them to sister X' - now it becomes  
25  
26 11 my problem - it was really tough.  
27  
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32 13 One district manager responded to inconsistent training coverage by instituting facility-  
33  
34 14 by-facility on-site training. This approach ensured '*everybody in the clinic becomes*  
35  
36 15 *trained and feel[s] comfortable with initiation through group mentorship*'. Fellow  
37  
38 16 managers responded enthusiastically to this model:  
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44 18 That's very good. If [trainers] come to the clinic they face the reality there.  
45  
46 19 Normally, with training, they use an ideal situation then you come back down to  
47  
48 20 earth with a hard bump. Also it helps many more people get trained rather than  
49  
50 21 taking one person out at a moment. I would really like it, I'm very excited. I  
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52 22 wish we could follow that!  
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1 Supporting partners' limited capacity to provide follow-up mentoring and conduct  
2 competency assessments for trained nurses was also identified as a challenge.  
3 Consequently, several nurses described providing NIMART before they felt confident  
4 enough to do so and reported feeling concerned because they were *'learning as we are  
5 going on'* and *'taking chances'*:  
6

7 It was a bit unfair for [NIMART] to be introduced in that fashion because there  
8 was no in-service training, there was nothing given. We were dish-upping the  
9 medication just like that and, as time went by, we discovered so many things  
10 that we did wrong.  
11

12 Many experienced uncertainty when interpreting abnormal laboratory results, managing  
13 complex co-morbidities or ART-associated adverse events. One 58 year old nurse based  
14 at a small, peri-urban facility, described how uncertain she felt during her first  
15 unsupervised ART initiation:  
16

17 At first it was scary - I was a little bit jittery because I was on my own. I had  
18 mentoring for about a week but when I took over, eh! I started shivering. I  
19 prayed: 'God, help me to go through this thing, I can't go alone on this journey'  
20

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

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

3  
4 I remember this patient I initiated [who] died. I felt bad...very bad. I thought 'no,  
5 this [NIMART] is just not for me.' I had that guilty feeling until [my mentor]  
6 scrutinised the file and reassured me: 'no, you did everything that you could, it's  
7 not your fault, you were saving a life, you did nothing wrong' so, at least I was  
8 a little bit better but sometimes you feel people will think you are killing  
9 patients.

10  
11 In contrast, at facilities without telephones, or where up-referral site doctors were  
12 '*refusing to come on board*' as mentors, inexperienced nurses described feeling isolated.  
13 The inadequate feedback provided by up-referral sites when patients returned to their  
14 original PHC facility also left nurses discouraged due to the lost opportunity for skills-  
15 transfer. Doctors were perceived as failing to recognise nurses as '*human beings [who]*  
16 '*really want to communicate with human beings*'. As this 54 year old NIMART-nurse  
17 explains:

18  
19 I think [doctors] don't understand the importance of the report back. It is a  
20 learning tool for a sister so that next time, when you get a patient like this, you  
21 know what to do. If they don't send us report how are we going to learn?  
22 Because we are not doctors, we are nurses.

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2  
3 1 In some facilities where mentorship from supporting partners or up-referral site doctors  
4  
5 2 was lacking, informal ‘in-house’ mentoring - provided by more experienced NIMART-  
6  
7  
8 3 nurses - emerged as an invaluable means to capacity-build newly trained colleagues. One  
9  
10 4 experienced NIMART-nurse described the impact her ‘in-house’ mentoring had on  
11  
12 5 programme sustainability at her facility:  
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14  
15 6

17 7 I started alone here as a NIMART-nurse. Now two other [trained] sisters are  
18 8 being mentored by me. They are coming very well. The facility staff  
19  
20 9 worried because if I'm away what will the clinic do? So now, at least, if I'm  
21  
22 10 away these two sisters are here.  
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29 12 These ‘nurse-mentors’ represented a highly acceptable and much needed alternative  
30  
31 13 source of clinical support. One NGO programme manager, facing limited mentoring  
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33 14 capacity within her organisation, concluded: *‘in terms of sustainability, nurses who are*  
34  
35 15 *competent have to start to mentor their own colleagues’.*  
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44 18 ***“Communication is one way down, they tell us what to do....we don’t have a say”:***

### 46 19 **Communication, Consultation and Networking**

48 20  
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50 21 Research participants shared how the DoH’s approach to change management had  
51  
52 22 created anger and confusion amongst some staff. Following minimal consultation, they  
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1 were unhappy that *'the [NIMART] programme is failing because we are not involved in*  
2 *planning'*.

3  
4 Facility managers also expressed dissatisfaction regarding 'readiness assessments',  
5 during which senior managers conducted site visits to establish a facility's capacity to  
6 provide NIMART. These visits were perceived as *'just an exercise'* which provided  
7 limited opportunities for staff to communicate their perceived needs and concerns.  
8 Several participants were clearly angered by their assessment experience:

9  
10 The assessor said: 'It's not ideal but start anyway!' It's not like you are really  
11 OK to do this, but start! These words we hear a lot with our managers: 'Do  
12 whatever you can with what we have.' I just want to die when I hear that  
13 because that's not good enough for me!

14  
15 Effective communication between facility-level staff often ameliorated the frustration  
16 arising from inadequate communication between senior management and ground-  
17 level staff. Inter-facility networking provided vital opportunity to encourage others  
18 and iron-out programmatic issues. For nurses, regular case-based training meetings  
19 increased their knowledge and confidence and allowed isolated NIMART-nurses,  
20 such as those cited above, to debrief with understanding peers. For facility-managers,  
21 meeting other managers to share skills, ideas, frustrations and experiences assisted  
22 with problem solving.

23

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3 1 Regular meetings between PHC facilities and up-referral hospital staff also facilitated  
4  
5 2 NIMART implementation by improving communication, addressing referral pathway  
6  
7  
8 3 weaknesses and building more supportive inter-collegial relationships. In areas  
9  
10 4 without regular inter-facility meetings, these relationships remained strained, often  
11  
12 5 resulting in patients being unnecessarily sent between various facilities due to poor  
13  
14 6 communication, as this nurse explains:  
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20 8 [The up-referral sites] chase patients away. If that patient has a letter from the  
21  
22 9 clinic they know that for the sister to refer means that they're stuck. We were  
23  
24 10 told 'if you don't know the diagnosis send them to the hospital'. Really, phoning,  
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26  
27 11 I don't accept it - why must we pamper [the doctors] by phoning [first]?  
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32 13 Communication is vital to the success of any health programme, including NIMART.  
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34 14 Inadequate staff consultation during planning impacted staff morale and hindered their  
35  
36 15 capacity to fully implement NIMART. Contrastingly, effective communication and  
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38 16 positive interactions between different levels of care became a critical component for  
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40 17 task-shifting success.  
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46 19 ***'These little hovels....it's disgraceful, really!': Infrastructure, Support Systems and***  
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48 **Innovative Integration Models**  
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51 21  
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53 22 Challenges associated with infrastructural shortcomings were ubiquitous, even before  
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55 23 NIMART rollout began, but were often compounded as clinics began dealing with  
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1 increasing numbers of ART patients. Staff at clinics with limited space described how  
2 they were 'no longer coping with the number of patient[s]', additional stock and extra  
3 services. These infrastructural constraints impacted morale; compromised staff health and  
4 affected clinic efficiency. Poor infrastructure also undermined NIMART-nurses' capacity  
5 to safeguard patient confidentiality during consultations. One nurse shared her distress  
6 about the situation at her facility:

7  
8 It's not nice. I want to talk about issues - the patient cannot speak loud because  
9 there's no space - we are dividing with cupboards or a curtain in one room so we  
10 can see four patients at each corner, which is not right.

11  
12 Participants also identified various other systems related challenges including: limited  
13 access to off-site investigations such as chest x-rays; cumbersome data collection  
14 processes which kept '*changing like petticoats*', out-dated telecommunications systems,  
15 fragmented patient transport services and complicated drug ordering processes. One busy  
16 inner-city clinic manager described her current situation:

17  
18 ...now I don't have [ART] medication because when we order it's such a  
19 process. I'm going to take from another site, say[ing] 'give me about three packs  
20 and when I get my stock I'll give you three back'. It's all about starting [patients]  
21 - nobody cares whether the systems are in place.

22

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3 1 However, some participants described how creative problem solving at facility level  
4  
5 2 eased NIMART integration, successfully addressing many implementation challenges  
6  
7 3 whilst minimising disruption to other PHC services. NIMART implementation appeared  
8  
9 4 to empower these nurses as it allowed them to develop systems which worked for them.  
10  
11 5 They reported increased job satisfaction and lower levels of concern about staff burnout  
12  
13 6 and unmanageable stress.  
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20 8 Two such integration models particularly captured other participants' imagination when  
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22 9 shared during the group discussions. One clinic established an internal up and down-  
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24 10 referral system within which time-consuming ART-initiation patients were managed by  
25  
26 11 the NIMART-nurse. On a rotational basis, every nurse operated as 'NIMART-nurse' for  
27  
28 12 one week. Once stable, ART-patients were 'down-referred' within the clinic to the  
29  
30 13 general PHC nurses who '*kept the chronics* [diabetic/hypertensive patients] *queue*  
31  
32 14 *moving*'. Thus the NIMART-nurse had more time to spend with complex patients whilst  
33  
34 15 well patients could be seen quickly. Stable ART-patients benefited from 'down-referral'  
35  
36 16 because queuing with other 'chronic' patients protected their confidentiality and reduced  
37  
38 17 waiting times. Additionally, as explained by the facility manager, the regular rotation  
39  
40 18 ensured all nurses became NIMART providers, thus strengthening programme  
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42 19 sustainability:  
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50 21 [Nurses] rotate so that they know everything. I don't get paralyzed when one  
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52 22 sister is not on duty and she's specializing in that role. Three to four people are  
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54 23 rotating: ANC, tuberculosis, wellness programme, chronics, ARVs.  
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5 2 Another smaller clinic, with just one NIMART-nurse, was now ‘*reserving Fridays for*  
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8 3 *initiations*’ so that he could spend sufficient time preparing these patients.  
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12 5 Thus, although infrastructural shortcomings threatened to undermine NIMART success at  
13  
14 6 many sites, some facility managers demonstrated remarkable innovation, adapting  
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16 7 integration models to overcome staffing and space constraints whilst minimising  
17  
18 8 disruption to existing services. For many participants, NIMART implementation was  
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20 9 perceived as empowering as it enabled them to develop and use systems that worked  
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22 10 within their local context.  
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## 34 **DISCUSSION**

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16 NIMART implementation is a complex health intervention. The experiences described  
17 above reflect key challenges and enabling factors which influence the quality of  
18 NIMART services provision. Despite the challenges, many managers and NIMART-  
19 nurses experienced providing antiretroviral therapy to their patients very positively; this  
20 was enhanced with structural and management support.  
21

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

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3 1 50% of nursing time is consumed by administrative tasks,[30, 31] concerns regarding  
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5 2 over-dependence on nurse-based task-shifting for ART scale-up appear well founded.[13]  
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8 3 The importance of expanding lower cadre staff compliments to perform basic tasks,  
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10 4 traditionally assigned to nurses, has been stressed elsewhere.[8, 17] This study highlights  
11  
12 5 the sustainability issues created when task-shifting to nurses is undertaken without  
13  
14 6 providing sufficient 'down-stream' staff. Realistic, standardised 'down-stream' staffing  
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16 7 levels and revised scopes of practice should be developed and universally  
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18 8 implemented.[12] Where resource constraints preclude provision of additional clinical  
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20 9 staff, data capturers, administrative clerks, nursing auxiliaries and community healthcare  
21  
22 10 workers – who require shorter training and lower remuneration - represent a vital means  
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24 11 of improving health service efficiency and sustainability.[12] Importantly, however,  
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26 12 facility managers also need to be better capacitated and motivated to effectively manage  
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28 13 existing staff compliments and optimally task-shift so that everyone performs appropriate  
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30 14 duties.[32]  
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39 16 Quality, safe task-shifting inarguably relies on comprehensive training, mentoring and  
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41 17 on-going quality assurance.[5, 33] Unfortunately, in this study, NIMART-nurses and  
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43 18 managers reported that hasty NIMART implementation had seriously compromised  
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45 19 access to these crucial capacity-building interventions. This undermined individual  
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47 20 nurses' confidence and left many facilities with an unsustainable NIMART programme  
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49 21 where only one nurse had been trained. Importantly, however, participants remained  
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51 22 optimistic and identified two practical interventions which may mitigate this situation.  
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55 23 Firstly, a shift is needed towards fast-tracking nurse-mentor development in which  
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1 experienced NIMART-nurses need to be equipped to supervise, support and train  
2 colleagues at their own and nearby facilities. Secondly, nurses require reliable access to  
3 telephonic support, perhaps through greater involvement of doctors at up-referral sites.  
4 These interventions might also address the emotional support and debriefing needs of  
5 nurses caring for patients with advanced disease, something which should not be under-  
6 estimated in a context such as South Africa.[34]

7  
8 Effective inter-facility communication, mutual support, teamwork and the use of creative  
9 problem solving at the facility-level were all important factors in enabling the successful  
10 implementation of NIMART. The theoretical benefits of teamwork [15] were described  
11 by participants working in ‘happy’ clinics where NIMART appeared to cause less  
12 disruption, stress and discontent. A culture of teamwork and innovative problem solving  
13 needs to be nurtured, particularly at poorly performing facilities, to better enable nurses  
14 and their managers to deal with NIMART implementation.

15  
16 The human resource and infrastructural constraints described in this study echo problems  
17 widely recognised as hindering ART-programme expansion in resource-limited  
18 settings.[35, 36] Although NIMART can effectively expand ART access it also continues  
19 to restrict service provision to increasingly overcrowded fixed facilities operating with  
20 limited human resources. Therefore, implementation of NIMART in isolation will likely  
21 fail to address the long-term sustainability of South Africa’s ART programme.[37] Task-  
22 shifting to nurses represents just one facet of decentralisation and there remains a need to  
23 look beyond traditional PHC facility-based services towards chronic care models which

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

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## 15 **Limitations and Future Research**

16  
17 This study took place early during South Africa's NIMART implementation process,  
18 when few nurses had started initiating ART and there was still much uncertainty about  
19 the programme. A follow-up study, once NIMART is firmly established in more facilities  
20 across South Africa, may shed light concerning healthcare providers' longer term  
21 adaptation to changing roles. The study was undertaken in an environment of intense  
22 political pressure to make NIMART succeed, which may have influenced participant

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

3  
4 Further research is needed to evaluate those clinics and districts which are considered  
5 ‘successful’ in order to better understand NIMART implementation. The behavioural  
6 nuances which enable some to embrace change and overcome challenges need to be  
7 better understood as this may inform the development of more sophisticated change  
8 management strategies that address resistance to change. On-going difficulties with  
9 referral processes indicate a need to develop and implement effective referral system  
10 strengthening interventions. Communication and inter-facility meetings also need to be  
11 considered in more detail to explore whether they facilitate improved relationships  
12 between staff and thus smoother referral systems.

## 13 14 15 **CONCLUSION**

16  
17 Despite the barriers to, and challenges of, NIMART, the overarching impression  
18 given by participants in this study is a positive one. In particular, whilst those who  
19 had recently started providing NIMART may have tended towards negativity, more  
20 experienced NIMART-nurses expressed greater optimism about the new programme,  
21 suggesting perhaps that perceptions may shift as clinical confidence grows.

22

1 Participants demonstrated an impressive capacity to overcome challenges and improve  
2 ART provision through determined innovation, creative problem solving, teamwork and  
3 positive attitudes. Targeted supportive interventions which meet the specific needs of  
4 facility-level implementers should now be implemented to enable them to continue  
5 providing quality NIMART services. Similarly, facilitators identified here need to be  
6 replicated across South Africa and other countries, harnessing their potential to ease  
7 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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10 4 Nurse and Manager Perceptions of Nurse Initiated and Managed Anti-Retroviral Therapy  
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12 (NIMART) Implementation in South Africa: A Qualitative Study  
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5 2 **ABSTRACT**6  
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10 4 **Objective:** To explore nurse and facility and programme manager perceptions of nurse  
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12 5 initiated and managed antiretroviral therapy (NIMART) implementation in Gauteng,  
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14 6 South Africa15  
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17 7 **Design:** In this qualitative study, in-depth interviews and focus group discussions were  
18  
19 8 conducted to gain insight into participants' experiences of NIMART implementation.20  
21  
22 9 **Setting:** Participants came from urban, peri-urban and rural primary health care clinics in  
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24 10 two Gauteng Province municipalities.25  
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27 11 **Participants:** 25 nurses and 18 managers who were actively involved in NIMART  
28  
29 12 implementation were purposively sampled.30  
31  
32 13 **Results:** Findings from this study reveal that, despite encountering numerous challenges  
33  
34 14 including human resources, training and clinical mentoring and health systems issues,  
35  
36 15 NIMART-nurses and managers remained optimistic about their work. Study participants  
37  
38 16 felt empowered by their expanded roles. Increased responsibilities associated with  
39  
40 17 NIMART implementation encouraged better use of creative problem solving and  
41  
42 18 teamwork to facilitate integration of NIMART into existing clinic services. NIMART-  
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44 19 nurses perceived ART patients to be more insightful about their illness, engaged in their  
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46 20 HIV treatment and aware of the importance of adherence which enhanced nurse-patient  
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48 21 relationships and increased their sense of job satisfaction.49  
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52 22 **Conclusion:**  
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3 1 Although the implementation of NIMART is complex, when NIMART is implemented  
4 well, ART access is increased and patient outcomes are improved. Supportive  
5  
6 2 interventions which address the specific challenges faced by nurses providing NIMART  
7  
8 3 now need to be implemented. Attempts should be made to replicate the positive aspects  
9  
10 4 of NIMART implementation identified by participants as this may improve healthcare  
11  
12 5 providers' experiences of task-shifting.  
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## 8 **ARTICLE SUMMARY**

### 9 **Article focus**

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

### 14 **Key Messages**

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

22

23

## 1 Strengths and limitations of this study

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

## 10 INTRODUCTION

12 The antiretroviral therapy (ART) programme in South Africa provides ART for over 2  
13 million individuals infected with human immunodeficiency virus (HIV).[1] Based on  
14 2010 World Health Organization (WHO) eligibility criteria, this equated to just 50% of  
15 qualifying individuals accessing treatment.[2] In late 2010, seeking faster programme  
16 expansion, South African public health policy switched from doctor-based, hospital-  
17 centric ART services to decentralised provision of nurse initiated and managed ART  
18 (NIMART).[3] Such task-shifting – delegating tasks to less specialised healthcare  
19 personnel – represents a key component of the WHO’s public health approach to ART  
20 programme scale-up.[4] Implementation of task-shifting, including NIMART, in  
21 Rwanda,[5] Malawi,[6] Mozambique,[7] Lesotho [8] and smaller projects in South Africa  
22 [9, 10] has generated positive gains including earlier, faster patient enrolment; improved

1 patient outcomes; greater acceptability and accessibility (particularly for rural  
2 populations); reduced patient transport costs and improved patient retention.  
3  
4 NIMART is a complex intervention intended to improve healthcare access and equity,  
5 ideally without compromising quality of care, in resource-limited settings.[11, 12]  
6 Optimal task-shifting requires well-resourced, multi-dimensional support including:  
7 health systems strengthening;[13] intensive staff engagement, training and mentoring;[14,  
8 15, 16] redistributing basic tasks to non-clinical staff [17] and robust referral, drug supply  
9 and quality assurance systems.[18] South Africa's plan to rapidly implement NIMART  
10 on an unprecedented nationwide scale raised questions regarding its capacity to meet all  
11 of these requirements.[13] If poorly managed, NIMART implementation risks  
12 inadequately supported nurses providing sub-optimal care, negatively impacting patient  
13 outcomes, staff confidence, morale and broader healthcare services.[19, 20]  
14  
15 Although individual, social, patient and organisational challenges are known to hinder  
16 effective healthcare change,[21] whether these factors influence change within ART  
17 programmes in resource-constrained settings have been little studied.[22, 23] Qualitative  
18 research - crucial to furthering our understanding of change within healthcare contexts –  
19 remains particularly scarce.[24] During early ART roll-out in South Africa those studies  
20 exploring healthcare worker experiences identified several challenges including  
21 insufficient staffing, high staff turnover, unmanageable workloads and burnout and  
22 inadequate planning, emotional support, communication and responsiveness from senior  
23 management.[25-27] Healthcare workers' experiences of adapting to NIMART related

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

## 3 4 5 **METHODS**

### 6 7 **Study Population and Setting**

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

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**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

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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

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

9  
10 The University of Witwatersrand Human Research Ethics Committee granted ethics  
11 clearance (M10108) and Gauteng Department of Health approved the study.

## 12 13 14 **Data Analysis**

15  
16 Audio recordings of interviews and focus groups were transcribed verbatim and  
17 transcripts were coded using NVivo 9 software, resulting in a framework of 84 narrowly  
18 defined codes. Coding was performed in stages, ensuring that the researcher became fully  
19 immersed in the data during multiple passes over each transcript. Using thematic content  
20 analysis, the 84 initial codes were consolidated into four key themes: human resources;  
21 training and clinical mentoring; communication and networking and infrastructural and  
22 support system issues. Co-authors reviewed random excerpts from all transcripts,  
23 confirming coding accuracy. The consistency of major themes was checked by

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3 1 comparing data from in-depth interviews and focus groups, from participants working in  
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6 2 different municipalities and from nurses and managers.  
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## 17 **RESULTS**

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22 9 During discussions participants identified numerous challenges which were perceived to  
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24 10 be hindering NIMART as well as several key enablers which facilitated implementation.  
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27 11 The four key themes which emerged during data analysis are presented here.  
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### 34 ***'You are alone as a sister...there's nobody helping you'*: Human Resources**

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39 16 Human resource issues heavily influenced participants' experiences of NIMART  
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41 17 implementation. Although one senior provincial manager asserted that current staffing  
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43 18 levels were adequate - *'you don't even need extra nurses for this [NIMART]'* - NIMART-  
44  
45 19 nurses and facility and district managers expressed frustration and disappointment  
46  
47 20 because extra human resources, perceived as essential, had not been forthcoming.  
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50  
51 21 Reporting widespread professional nurse shortages, nurses described *'struggling to cope*  
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53 22 *with the workload'* as a result of their additional NIMART responsibilities. Integrating  
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55 23 NIMART into existing PHC services heightened target-related performance pressures,  
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1 which, in some facilitates, created an increasingly unpleasant working environment. For  
2 some participants, this triggered growing resentment because they perceived task-shifting  
3 away from doctors as an ‘abuse’ of the role of nurses. As this 47 year old NIMART-nurse  
4 with 20 years of nursing experience relates:

5  
6 [NIMART is] a problem because we are only three [sisters]. We have ANC  
7 [antenatal care], child services, PHC, family planning, TB. All this basket of  
8 services to be rendered.

9  
10 Nurse shortages were reported as being compounded by underrepresentation of lower  
11 cadres of healthcare worker. This left managers unable to delegate administrative and  
12 basic clinic tasks to ‘down-stream’ staff. One regional manager described how  
13 widespread shortages of enrolled nurses, nursing assistants, data collectors and  
14 counsellors precluded what was, to her understanding, true task-shifting. She concluded  
15 that ‘...as a nurse, you are everything... *Jack of all trades*’. Considering nurses take ‘*up*  
16 *to an hour to initiate one ART-patient*’, she noted that the inability to shift basic tasks  
17 away from nurses undermined the quality of care provided to the patient, prevented  
18 nurses from seeing sufficient numbers of ART-patients and lengthened waiting times for  
19 other patient groups. Additionally, important administrative activities, including  
20 maintaining patient registers and pharmacy records, were described as ‘*fall[ing] by the*  
21 *wayside*’. One facility manager, from a busy Johannesburg clinic, voiced her concerns:

22

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

5  
6 This tension between trying to meet performance targets including shorter waiting-times  
7 and higher patient turnover, whilst simultaneously striving to provide time-consuming,  
8 individualised care was raised by many participants. One regional manager asked:

9  
10 Are we looking at quality or quantity? NIMART is a very, very sensitive  
11 programme. We end up with patients defaulting because you don't have time for  
12 them - you are chasing the waiting-time target.

13  
14 Despite human resource shortages, staff attitudes towards NIMART remained  
15 overwhelmingly positive. In particular, those whose relatives had died whilst awaiting  
16 doctor-led ART initiation were enthusiastic and considered NIMART '*long overdue*'.  
17 Others found relief in providing continuity of care and initiating their own patients rather  
18 than knowing patients were waiting to initiate treatment at up-referral sites. Those  
19 familiar with preparing patients for doctor initiation and managing stable ART-patients  
20 talked about feeling ready and being 'excited' about the new responsibility, as this nurse  
21 explains:

22  
23 I was really very excited to do NIMART...it was unnecessary for me to send

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

4

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

7

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

12

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

19

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

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

3  
4 Where a supportive, team-oriented culture prevailed, staff appeared more resilient to  
5 change-related pressures and morale seemed higher, whereas in facilities with an  
6 individualistic ethos, negative experiences were more common. This participant, who  
7 was the only NIMART-nurse at her facility, described feeling unsupported by nursing  
8 colleagues:

9  
10 [My colleagues] always say 'no, we're not trained'. They were just piling  
11 everything for me. When I went on leave clients were not given [ART]  
12 treatment. The first day I came back [colleagues said] 'we're so long waiting for  
13 you!' Then I turned my back, I said 'no, I'm not doing it. Somebody must take  
14 over. It's not my job - it's everybody's job!'

15  
16 Contrastingly, nurses working within well-established teams described improvising and  
17 working together to overcome barriers to NIMART implementation:

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

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3 1 Alongside effective teamwork, positive experiences of caring for ART-patients also  
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5 2 engendered more supportive staff attitudes. Nurses reported that ART-patients tend to be  
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7 3 more insightful about their illness; more engaged in their management and more aware of  
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9 4 the importance of treatment adherence compared to other patient groups. This NIMART-  
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11 5 nurse, from a small peri-urban site, described her enjoyment of working with ART-  
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13 6 patients:  
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20 8 It's very nice to initiate patients on ART. You get to know the patients deeper.  
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22 9 You talk about side-effects, the CD4 count. You feel like 'I'm building a  
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24 10 relationship between me and this patient'. The patient gets confidence in you,  
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26 11 they will tell you 'Sister, I've got sores in my mouth and I'm worried – what do  
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28 12 you think?' They will be specific.  
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34 14 Others shared about the satisfaction they derived from playing a key role in their patients'  
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36 15 recovery. Rather than losing track of patients following up-referral, nurses were now  
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38 16 witnessing patients, including terminally ill individuals, rapidly improving on treatment.  
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40 17 Tangibly impacting patients' lives incentivised nurses and boosted morale:  
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46 19 The relationship I build with patients, it's nice. You can see if your patient is  
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48 20 progressing well or if the condition is deteriorating. I'm doing PMTCT  
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50 21 [prevention of mother-to-child transmission] so you make that relationship, the  
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52 22 patient delivers, you follow-up the baby. It's nice if the baby is negative.  
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3 1 These positive experiences led participants to persuade other colleagues to become  
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5 2 NIMART-nurses. They wanted their peers to experience the satisfaction of providing life-  
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8 3 changing care.  
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15 6 ***'I'm not yet ready [to initiate]...I still have hiccups...I need support': Training and***  
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18 7 **Clinical Mentoring**

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22 9 Non-governmental organisation (NGO) programme managers, who were partnering with  
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24 10 Department of Health (DoH) to support NIMART implementation, shared the difficulties  
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27 11 created by *'rolling out the service and then capacitating the nurses'*. DoH pressure to  
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29 12 implement NIMART quickly often resulted in poorly co-ordinated NGO-supported  
30  
31 13 training activities.  
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36 15 Although nurses who attended off-site training described it as comprehensive and  
37  
38 16 informative they criticised managers for haphazard coordination and inappropriate staff  
39  
40 17 selection. In some facilities nurses who were *'not interested in NIMART'* undermined  
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42 18 programme sustainability by refusing to attend training. Several nurses described the  
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44 19 difficulties created by having only one trained nurse at their facility:  
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51 21 [Managers] don't care how many nurses have undergone training and some  
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53 22 nurses are reluctant to go for training and start this initiation thing so if you go  
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55 23 for training maybe you are the only one. All the HIV patients they'll be saying  
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3 1 'it's your patients, this is your problem, take them to sister X' - now it becomes  
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6 2 my problem - it was really tough.  
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10 3  
11 4 One district manager responded to inconsistent training coverage by instituting facility-  
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13 5 by-facility on-site training. This approach ensured '*everybody in the clinic becomes*  
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15 6 *trained and feel[s] comfortable with initiation through group mentorship*'. Fellow  
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17 7 managers responded enthusiastically to this model:  
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22 9 That's very good. If [trainers] come to the clinic they face the reality there.  
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24 10 Normally, with training, they use an ideal situation then you come back down to  
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26 11 earth with a hard bump. Also it helps many more people get trained rather than  
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28 12 taking one person out at a moment. I would really like it, I'm very excited. I  
29  
30 13 wish we could follow that!  
31  
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33

34 14  
35  
36 15 Supporting partners' limited capacity to provide follow-up mentoring and conduct  
37  
38 16 competency assessments for trained nurses was also identified as a challenge.  
39  
40 17 Consequently, several nurses described providing NIMART before they felt confident  
41  
42 18 enough to do so and reported feeling concerned because they were '*learning as we are*  
43  
44 19 *going on*' and '*taking chances*':  
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48 20  
49  
50 21 It was a bit unfair for [NIMART] to be introduced in that fashion because there  
51  
52 22 was no in-service training, there was nothing given. We were dish-upping the  
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1 medication just like that and, as time went by, we discovered so many things  
2 that we did wrong.

3  
4 Many experienced uncertainty when interpreting abnormal laboratory results, managing  
5 complex co-morbidities or ART-associated adverse events. One 58 year old nurse based  
6 at a small, peri-urban facility, described how uncertain she felt during her first  
7 unsupervised ART initiation:

8  
9 At first it was scary - I was a little bit jittery because I was on my own. I had  
10 mentoring for about a week but when I took over, eh! I started shivering. I  
11 prayed: 'God, help me to go through this thing, I can't go alone on this journey'

12  
13 Conversely, other nurses described receiving support from mentors who were *'just a*  
14 *phone call away'*. Such telephonic support proved crucial as it enabled these nurses to  
15 gain confidence gradually despite minimal on-site mentorship, and provided essential  
16 opportunity for debriefing. Debriefing enabled nurses to re-engage with NIMART after a  
17 patient death had affected their self-confidence:

18  
19 I remember this patient I initiated [who] died. I felt bad...very bad. I thought 'no,  
20 this [NIMART] is just not for me.' I had that guilty feeling until [my mentor]  
21 scrutinised the file and reassured me: 'no, you did everything that you could, it's  
22 not your fault, you were saving a life, you did nothing wrong' so, at least I was  
23 a little bit better but sometimes you feel people will think you are killing



1 patients.

2

3 In contrast, at facilities without telephones, or where up-referral site doctors were

4 *'refusing to come on board'* as mentors, inexperienced nurses described feeling isolated.

5 The inadequate feedback provided by up-referral sites when patients returned to their

6 original PHC facility also left nurses discouraged due to the lost opportunity for skills-

7 transfer. Doctors were perceived as failing to recognise nurses as *'human beings [who]*

8 *really want to communicate with human beings'*. As this 54 year old NIMART-nurse

9 explains:

10

11 I think [doctors] don't understand the importance of the report back. It is a

12 learning tool for a sister so that next time, when you get a patient like this, you

13 know what to do. If they don't send us report how are we going to learn?

14 Because we are not doctors, we are nurses.

15

16 In some facilities where mentorship from supporting partners or up-referral site doctors

17 was lacking, informal 'in-house' mentoring - provided by more experienced NIMART-

18 nurses - emerged as an invaluable means to capacity-build newly trained colleagues. One

19 experienced NIMART-nurse described the impact her 'in-house' mentoring had on

20 programme sustainability at her facility:

21

22 I started alone here as a NIMART-nurse. Now two other [trained] sisters are

23 being mentored by me. They are coming very well. The facility staff

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

3  
4 These 'nurse-mentors' represented a highly acceptable and much needed alternative  
5 source of clinical support. One NGO programme manager, facing limited mentoring  
6 capacity within her organisation, concluded: '*in terms of sustainability, nurses who are*  
7 *competent have to start to mentor their own colleagues*'.

8  
9  
10 ***"Communication is one way down, they tell us what to do....we don't have a say":***

### 11 **Communication, Consultation and Networking**

12  
13 Research participants shared how the DoH's approach to change management had  
14 created anger and confusion amongst some staff. Following minimal consultation, they  
15 were unhappy that '*the [NIMART] programme is failing because we are not involved in*  
16 *planning*'.

17  
18 Facility managers also expressed dissatisfaction regarding 'readiness assessments',  
19 during which senior managers conducted site visits to establish a facility's capacity to  
20 provide NIMART. These visits were perceived as '*just an exercise*' which provided  
21 limited opportunities for staff to communicate their perceived needs and concerns.

22 Several participants were clearly angered by their assessment experience:  
23

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

5  
6 Effective communication between facility-level staff often ameliorated the frustration  
7 arising from inadequate communication between senior management and ground-  
8 level staff. Inter-facility networking provided a vital opportunity to encourage others  
9 and iron-out programmatic issues. For nurses, regular case-based training meetings  
10 increased their knowledge and confidence and allowed isolated NIMART-nurses,  
11 such as those cited above, to debrief with understanding peers. For facility-managers,  
12 meeting other managers to share skills, ideas, frustrations and experiences assisted  
13 with problem solving.

14  
15 Regular meetings between PHC facilities and up-referral hospital staff also facilitated  
16 NIMART implementation by improving communication, addressing referral pathway  
17 weaknesses and building more supportive inter-collegial relationships. In areas  
18 without regular inter-facility meetings, these relationships remained strained, often  
19 resulting in patients being unnecessarily sent between various facilities due to poor  
20 communication, as this nurse explains:

21  
22 [The up-referral sites] chase patients away. If that patient has a letter from the  
23 clinic they know that for the sister to refer means that they're stuck. We were

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

3  
4 Communication is vital to the success of any health programme, including NIMART.  
5 Inadequate staff consultation during planning impacted staff morale and hindered their  
6 capacity to fully implement NIMART. Contrastingly, effective communication and  
7 positive interactions between different levels of care became a critical component for  
8 task-shifting success.

### 9 10 ***'These little hovels....it's disgraceful, really!': Infrastructure, Support Systems and*** 11 **Innovative Integration Models**

12  
13 Challenges associated with infrastructural shortcomings were ubiquitous, even before  
14 NIMART rollout began, but were often compounded as clinics began dealing with  
15 increasing numbers of ART patients. Staff at clinics with limited space described how  
16 they were *'no longer coping with the number of patient[s]'*, additional stock and extra  
17 services. These infrastructural constraints impacted morale; compromised staff health and  
18 affected clinic efficiency. Poor infrastructure also undermined NIMART-nurses'  
19 capacities to safeguard patient confidentiality during consultations. One nurse shared her  
20 distress about the situation at her facility:

21

1  
2  
3 1 It's not nice. I want to talk about issues - the patient cannot speak loud because  
4  
5 2 there's no space - we are dividing with cupboards or a curtain in one room so we  
6  
7  
8 3 can see four patients at each corner, which is not right.  
9  
10 4

11  
12 5 Participants also identified various other systems related challenges including: limited  
13  
14 6 access to off-site investigations such as chest x-rays; cumbersome data collection  
15  
16 7 processes which kept '*changing like petticoats*', out-dated telecommunications systems,  
17  
18 8 fragmented patient transport services and complicated drug ordering processes. One busy  
19  
20 9 inner-city clinic manager described her current situation:  
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11 ...now I don't have [ART] medication because when we order it's such a  
12 process. I'm going to take from another site, say[ing] 'give me about three packs  
13 and when I get my stock I'll give you three back'. It's all about starting [patients]  
14 - nobody cares whether the systems are in place.

15  
16 However, some participants described how creative problem solving at facility level  
17 eased NIMART integration, successfully addressing many implementation challenges  
18 whilst minimising disruption to other PHC services. NIMART implementation appeared  
19 to empower these nurses as it allowed them to develop systems which worked for them.  
20 They reported increased job satisfaction and lower levels of concern about staff burnout  
21 and unmanageable stress.  
22

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

13  
14 [Nurses] rotate so that they know everything. I don't get paralyzed when one  
15 sister is not on duty and she's specialising in that role. Three to four people are  
16 rotating: ANC, tuberculosis, wellness programme, chronics, ARVs.

17  
18 Another smaller clinic, with just one NIMART-nurse, was now '*reserving Fridays for*  
19 *initiations*' so that he could spend sufficient time preparing these patients.

20  
21 Thus, although infrastructural shortcomings threatened to undermine NIMART success at  
22 many sites, some facility managers demonstrated remarkable innovation, adapting  
23 integration models to overcome staffing and space constraints whilst minimising

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3 1 disruption to existing services. For many participants, NIMART implementation was  
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6 2 perceived as empowering as it enabled them to develop and use systems that worked  
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8 3 within their local context.  
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## 17 **DISCUSSION**

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22 9 NIMART implementation is a complex health intervention. The experiences described  
23  
24 10 above reflect key challenges and enabling factors which influence the quality of  
25  
26  
27 11 NIMART services provision. Despite the challenges, many managers and NIMART-  
28  
29 12 nurses experienced providing antiretroviral therapy to their patients very positively; this  
30  
31 13 was enhanced with structural and management support.  
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36 15 Human resource shortages are a well-recognised hindrance to rapid ART programme  
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38 16 expansion. Considering 40% of nursing posts in South Africa lie vacant [29] and up to  
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40 17 50% of nursing time is consumed by administrative tasks,[30, 31] concerns regarding  
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42 18 over-dependence on nurse-based task-shifting for ART scale-up appear well founded.[13]  
43  
44  
45 19 The importance of expanding lower cadre staff complements to perform basic tasks,  
46  
47 20 traditionally assigned to nurses, has been stressed elsewhere.[8, 17] This study highlights  
48  
49 21 the sustainability issues created when task-shifting to nurses is undertaken without  
50  
51 22 providing sufficient 'down-stream' staff. Realistic, standardised 'down-stream' staffing  
52  
53 23 levels and revised scopes of practice should be developed and universally  
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1 implemented.[12] Where resource constraints preclude provision of additional clinical  
2 staff, data capturers, administrative clerks, nursing auxiliaries and community healthcare  
3 workers – who require shorter training and lower remuneration - represent a vital means  
4 of improving health service efficiency and sustainability.[12] Importantly, however,  
5 facility managers also need to be better capacitated and motivated to effectively manage  
6 existing staff complements and optimally task-shift so that everyone performs appropriate  
7 duties.[32]

8  
9 Quality, safe task-shifting inarguably relies on comprehensive training, mentoring and  
10 on-going quality assurance.[5, 33] Unfortunately, in this study, NIMART-nurses and  
11 managers reported that hasty NIMART implementation had seriously compromised  
12 access to these crucial capacity-building interventions. This undermined individual  
13 nurses' confidence and left many facilities with an unsustainable NIMART programme  
14 where only one nurse had been trained. Providing on-site NIMART training to several  
15 nurses at a facility – as was happening in one district – would address this common  
16 problem. Importantly, despite these difficulties, participants remained optimistic and  
17 identified two further practical interventions which may mitigate this situation. Firstly, a  
18 shift is needed towards fast-tracking nurse-mentor development in which experienced  
19 NIMART-nurses need to be equipped to supervise, support and train colleagues at their  
20 own and nearby facilities. Secondly, nurses require reliable access to telephonic support,  
21 perhaps through greater involvement of doctors at up-referral sites. These interventions  
22 might also address the emotional support and debriefing needs of nurses caring for



1  
2  
3 1 patients with advanced disease, something which should not be under-estimated in a  
4  
5 2 context such as South Africa.[34]  
6  
7 3  
8  
9 4 Effective inter-facility communication, mutual support, teamwork and the use of creative  
10  
11 5 problem solving at the facility-level were all important factors in enabling the successful  
12  
13 6 implementation of NIMART. Several benefits of teamwork [15] were described by  
14  
15 7 participants working in 'happy' clinics where NIMART appeared to cause less  
16  
17 8 disruption, stress and discontent. A culture of teamwork and innovative problem-solving  
18  
19 9 should be nurtured to better enable nurses and their managers to deal with NIMART  
20  
21 10 implementation. Establishment and support of quality improvement teams within  
22  
23 11 facilities may be one means of strengthening this area.  
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31  
32 13 The human resource and infrastructural constraints described in this study echo problems  
33  
34 14 widely recognised as hindering ART-programme expansion in resource-limited  
35  
36 15 settings.[35, 36] Although NIMART can effectively expand ART access it also continues  
37  
38 16 to restrict service provision to increasingly overcrowded fixed facilities operating with  
39  
40 17 limited human resources. Therefore, implementation of NIMART in isolation will likely  
41  
42 18 fail to address the long-term sustainability of South Africa's ART programme.[37] Task-  
43  
44 19 shifting to nurses represents just one facet of decentralisation and there remains a need to  
45  
46 20 look beyond traditional PHC facility-based services towards chronic care models which  
47  
48 21 involve patients in self-management and community support. Shifting the care of healthy,  
49  
50 22 stable ART-patients out of fixed facilities has been shown to further improve patient  
51  
52 23 outcomes and reduce reliance on overstretched health services, releasing healthcare  
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1 workers to spend more time and effort on the sick and on improving long term patient  
2 retention.[38-41] Although South Africa is now implementing a new primary healthcare  
3 model in which community healthcare workers will provide health promotion and  
4 prevention interventions at community and household levels,[42] future national health  
5 policies may need to go even further, engaging patients with any chronic condition (HIV,  
6 diabetes, hypertension) in self-management and utilising them as community healthcare  
7 workers, peer educators, lay counsellors and expert patients who provide community-  
8 based patient support.[43, 44]

## 12 **Limitations and Future Research**

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

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2  
3 1 Further research is needed to evaluate those clinics and districts which are considered  
4  
5 2 ‘successful’ in order to better understand NIMART implementation. The behavioural  
6  
7  
8 3 nuances which enable some to embrace change and overcome challenges need to be  
9  
10 4 better understood as this may inform the development of more sophisticated change  
11  
12 5 management strategies that address resistance to change. On-going difficulties with  
13  
14 6 referral processes indicate a need to develop and implement effective referral system  
15  
16 7 strengthening interventions. One option, which some participants felt enhanced  
17  
18 8 communication with up-referral sites, was the introduction of regular inter-facility  
19  
20 9 meetings. This approach should be examined further to establish whether it does indeed  
21  
22 10 improve relationships between staff and thus strengthen referral systems. Standardised  
23  
24 11 written feedback forms, to be used when patients are referred back to their PHC facility,  
25  
26 12 should also be developed and piloted to assess any positive impact on referral processes.  
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## 36 15 **CONCLUSION**

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41 17 Despite the barriers to, and challenges of, NIMART, the overarching impression  
42  
43 18 given by participants in this study is a positive one. In particular, whilst those who  
44  
45 19 had recently started providing NIMART may have tended towards negativity, more  
46  
47 20 experienced NIMART-nurses expressed greater optimism about the new programme,  
48  
49 21 suggesting perhaps that perceptions may shift as clinical confidence grows.  
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1 Participants demonstrated an impressive capacity to overcome challenges and improve  
2 ART provision through determined innovation, creative problem solving, teamwork and  
3 positive attitudes. Targeted supportive interventions which meet the specific needs of  
4 facility-level implementers should now be implemented to enable them to continue  
5 providing quality NIMART services. Similarly, facilitators identified here need to be  
6 replicated across South Africa and other countries, harnessing their potential to ease  
7 healthcare providers' experience of change.

8

9

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11

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16

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20

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22 All three authors meet the ICMJE guidelines for authorship for this manuscript being  
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24

25

26

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

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10 4 Nurse and Manager Perceptions of Nurse Initiated and Managed Anti-Retroviral Therapy  
11 (NIMART) Implementation in South Africa: A Qualitative Study  
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6 **Key Words:** HIV; antiretroviral therapy; South Africa; nurse-initiated-and-managed-  
7 ART (NIMART); task-shifting; qualitative research

9 **Word Count:** 4941

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1

2 **ABSTRACT**

3

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

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

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

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

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

22 **Conclusion:**

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

## 8 | **ARTICLE SUMMARY**

### 9 | **Article focus**

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

### 14 | **Key Messages**

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

### 22 | **Strengths and limitations of this study**

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

## 9 INTRODUCTION

10  
11 The antiretroviral therapy (ART) programme in South Africa provides ART for over 2  
12 million individuals infected with human immunodeficiency virus (HIV).[1] Based on  
13 2010 World Health Organization (WHO) eligibility criteria, this equated to just 50% of  
14 qualifying individuals accessing treatment.[2] In late 2010, seeking faster programme  
15 expansion, South African public health policy switched from doctor-based, hospital-  
16 centric ART services to decentralised provision of nurse initiated and managed ART  
17 (NIMART).[3] Such task-shifting – delegating tasks to less specialised healthcare  
18 personnel – represents a key component of the WHO’s public health approach to ART  
19 programme scale-up.[4] Implementation of task-shifting, including NIMART, in  
20 Rwanda,[5] Malawi,[6] Mozambique,[7] Lesotho [8] and smaller projects in South Africa  
21 [9, 10] has generated positive gains including earlier, faster patient enrolment; improved  
22 patient outcomes; greater acceptability and accessibility (particularly for rural  
23 populations); reduced patient transport costs and improved patient retention.



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5 2 NIMART is a complex intervention intended to improve healthcare access and equity,  
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8 3 ideally without compromising quality of care, in resource-limited settings.[11, 12]  
9  
10 4 Optimal task-shifting requires well-resourced, multi-dimensional support including:  
11  
12 5 health systems strengthening;[13] intensive staff engagement, training and mentoring;[14,  
13  
14 6 15, 16] redistributing basic tasks to non-clinical staff [17] and robust referral, drug supply  
15  
16 7 and quality assurance systems.[18] South Africa's plan to rapidly implement NIMART  
17  
18 8 on an unprecedented nationwide scale raised questions regarding its capacity to meet all  
19  
20 9 of these requirements.[13] If poorly managed, NIMART implementation risks  
21  
22 10 inadequately supported nurses providing sub-optimal care, negatively impacting patient  
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24 11 outcomes, staff confidence, morale and broader healthcare services.[19, 20]  
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27 12  
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29 13 Although individual, social, patient and organisational challenges are known to hinder  
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31 14 effective healthcare change,[21] whether these factors influence change within ART  
32  
33 15 programmes in resource-constrained settings have been little studied.[22, 23] Qualitative  
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35 16 research - crucial to furthering our understanding of change within healthcare contexts –  
36  
37 17 remains particularly scarce.[24] During early ART roll-out in South Africa those studies  
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39 18 exploring healthcare worker experiences identified several challenges including  
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41 19 insufficient staffing, high staff turnover, unmanageable workloads and burnout and  
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43 20 inadequate planning, emotional support, communication and responsiveness from senior  
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45 21 management.[25-27] Healthcare workers' experiences of adapting to NIMART related  
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47 22 task-shifting need exploration.[28] The authors investigated South Africa's NIMART  
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49 23 implementation process from the perspective of NIMART-nurses and their managers.  
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## 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.

1 **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

2

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

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

7  
8 The University of Witwatersrand Human Research Ethics Committee granted ethics  
9 clearance (M10108) and Gauteng Department of Health approved the study.

## 12 **Data Analysis**

13  
14 Audio recordings of interviews and focus groups were transcribed verbatim and  
15 transcripts were coded using NVivo 9 software, resulting in a framework of 84 narrowly  
16 defined codes. Coding was performed in stages, ensuring that the researcher became fully  
17 immersed in the data during multiple passes over each transcript. Using thematic content  
18 analysis, the 84 initial codes were consolidated into four key themes: human resources;  
19 training and clinical mentoring; communication and networking and infrastructural and  
20 support system issues. Co-authors reviewed random excerpts from all transcripts,  
21 confirming coding accuracy. The consistency of major themes was checked by  
22 comparing data from in-depth interviews and focus groups, from participants working in  
23 different municipalities and from nurses and managers.

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5 **RESULTS**

6

7 During discussions participants identified numerous challenges which were perceived to

8 be hindering NIMART as well as several key enablers which facilitated implementation.

9 The four key themes which emerged during data analysis are presented here.

10

11

12 ***'You are alone as a sister...there's nobody helping you': Human Resources***

13

14 Human resource issues heavily influenced participants' experiences of NIMART

15 implementation. Although one senior provincial manager asserted that current staffing

16 levels were adequate - *'you don't even need extra nurses for this [NIMART]'* - NIMART-

17 nurses and facility and district managers expressed frustration and disappointment

18 because extra human resources, perceived as essential, had not been forthcoming.

19 Reporting widespread professional nurse shortages, nurses described *'struggling to cope*20 *with the workload'* as a result of their additional NIMART responsibilities. Integrating

21 NIMART into existing PHC services heightened target-related performance pressures,

22 which, in some facilitates, created an increasingly unpleasant working environment. For

23 some participants, this triggered growing resentment because they perceived task-shifting

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

3  
4 [NIMART is] a problem because we are only three [sisters]. We have ANC  
5 [antenatal care], child services, PHC, family planning, TB. All this basket of  
6 services to be rendered.

7  
8 Nurse shortages were reported as being compounded by underrepresentation of lower  
9 cadres of healthcare worker. This left managers unable to delegate administrative and  
10 basic clinic tasks to ‘down-stream’ staff. One regional manager described how  
11 widespread shortages of enrolled nurses, nursing assistants, data collectors and  
12 counsellors precluded what was, to her understanding, true task-shifting. She concluded  
13 that ‘...as a nurse, you are everything... *Jack of all trades*’. Considering nurses take ‘*up*  
14 *to an hour to initiate one ART-patient*’, she noted that the inability to shift basic tasks  
15 away from nurses undermined the quality of care provided to the patient, prevented  
16 nurses from seeing sufficient numbers of ART-patients and lengthened waiting times for  
17 other patient groups. Additionally, important administrative activities, including  
18 maintaining patient registers and pharmacy records, were described as ‘*fall[ing] by the*  
19 *wayside*’. One facility manager, from a busy Johannesburg clinic, voiced her concerns:

20  
21 [The nurses] are so pressured, working right up to or past four o’clock. They  
22 don’t have time to get their rooms in order or replenish medication. The poor

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

3  
4 This tension between trying to meet performance targets including shorter waiting-times  
5 and higher patient turnover, whilst simultaneously striving to provide time-consuming,  
6 individualised care was raised by many participants. One regional manager asked:

7  
8 Are we looking at quality or quantity? NIMART is a very, very sensitive  
9 programme. We end up with patients defaulting because you don't have time for  
10 them - you are chasing the waiting-time target.

11  
12 Despite human resource shortages, staff attitudes towards NIMART remained  
13 overwhelmingly positive. In particular, those whose relatives had died whilst awaiting  
14 doctor-led ART initiation were enthusiastic and considered NIMART '*long overdue*'.  
15 Others found relief in providing continuity of care and initiating their own patients rather  
16 than knowing patients were waiting to initiate treatment at up-referral sites. Those  
17 familiar with preparing patients for doctor initiation and managing stable ART-patients  
18 talked about feeling ready and being 'excited' about the new responsibility, as this nurse  
19 explains:

20  
21 I was really very excited to do NIMART...it was unnecessary for me to send  
22 patients [away] whereas I can initiate myself. I was a little worried about side-  
23 effects but I was not at all scared. I told myself these things I've been exposed to

1 a long time.

2

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

5

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

10

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

17

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



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5 2 Where a supportive, team-oriented culture prevailed, staff appeared more resilient to  
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8 3 change-related pressures and morale seemed higher, whereas in facilities with an  
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10 4 individualistic ethos, negative experiences were more common. This participant, who  
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12 5 was the only NIMART-nurse at her facility, described feeling unsupported by nursing  
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14 6 colleagues:

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20 8 [My colleagues] always say 'no, we're not trained'. They were just piling  
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22 9 everything for me. When I went on leave clients were not given [ART]  
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24 10 treatment. The first day I came back [colleagues said] 'we're so long waiting for  
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26 11 you!' Then I turned my back, I said 'no, I'm not doing it. Somebody must take  
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28 12 over. It's not my job - it's everybody's job!'

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34 14 Contrastingly, nurses working within well-established teams described improvising and  
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36 15 working together to overcome barriers to NIMART implementation:

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41 17 ...space is a challenge but we improvise because our clinic is very hectic. I said  
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43 18 'you have to be flexible...just find a corner'. We did some partitioning so we  
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45 19 could do counselling [and improve] the patient flow. I was fortunate; people  
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47 20 were very flexible and hard-working.

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52 22 Alongside effective teamwork, positive experiences of caring for ART-patients also  
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54 23 engendered more supportive staff attitudes. Nurses reported that ART-patients tend to be

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

5  
6 It's very nice to initiate patients on ART. You get to know the patients deeper.  
7 You talk about side-effects, the CD4 count. You feel like 'I'm building a  
8 relationship between me and this patient'. The patient gets confidence in you,  
9 they will tell you 'Sister, I've got sores in my mouth and I'm worried – what do  
10 you think?' They will be specific.

11  
12 Others shared about the satisfaction they derived from playing a key role in their patients'  
13 recovery. Rather than losing track of patients following up-referral, nurses were now  
14 witnessing patients, including terminally ill individuals, rapidly improving on treatment.  
15 Tangibly impacting patients' lives incentivised nurses and boosted morale:

16  
17 The relationship I build with patients, it's nice. You can see if your patient is  
18 progressing well or if the condition is deteriorating. I'm doing PMTCT  
19 [prevention of mother-to-child transmission] so you make that relationship, the  
20 patient delivers, you follow-up the baby. It's nice if the baby is negative.

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3 1 These positive experiences led participants to persuade other colleagues to become  
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5 2 NIMART-nurses. They wanted their peers to experience the satisfaction of providing life-  
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8 3 changing care.  
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15 6 ***'I'm not yet ready [to initiate]...I still have hiccups...I need support': Training and***  
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17 7 **Clinical Mentoring**  
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22 9 Non-governmental organisation (NGO) programme managers, who were partnering with  
23  
24 10 Department of Health (DoH) to support NIMART implementation, shared the difficulties  
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27 11 created by *'rolling out the service and then capacitating the nurses'*. DoH pressure to  
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29 12 implement NIMART quickly often resulted in poorly co-ordinated NGO-supported  
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31 13 training activities.  
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36 15 Although nurses who attended off-site training described it as comprehensive and  
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38 16 informative they criticised managers for haphazard coordination and inappropriate staff  
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40 17 selection. In some facilities nurses who were *'not interested in NIMART'* undermined  
41  
42 18 programme sustainability by refusing to attend training. Several nurses described the  
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44 19 difficulties created by having only one trained nurse at their facility:  
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50 21 [Managers] don't care how many nurses have undergone training and some  
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52 22 nurses are reluctant to go for training and start this initiation thing so if you go  
53  
54 23 for training maybe you are the only one. All the HIV patients they'll be saying  
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1 'it's your patients, this is your problem, take them to sister X' - now it becomes  
2 my problem - it was really tough.

3  
4 One district manager responded to inconsistent training coverage by instituting facility-  
5 by-facility on-site training. This approach ensured '*everybody in the clinic becomes*  
6 *trained and feel[s] comfortable with initiation through group mentorship*'. Fellow  
7 managers responded enthusiastically to this model:

8  
9 That's very good. If [trainers] come to the clinic they face the reality there.  
10 Normally, with training, they use an ideal situation then you come back down to  
11 earth with a hard bump. Also it helps many more people get trained rather than  
12 taking one person out at a moment. I would really like it, I'm very excited. I  
13 wish we could follow that!

14  
15 Supporting partners' limited capacity to provide follow-up mentoring and conduct  
16 competency assessments for trained nurses was also identified as a challenge.  
17 Consequently, several nurses described providing NIMART before they felt confident  
18 enough to do so and reported feeling concerned because they were '*learning as we are*  
19 *going on*' and '*taking chances*'.

20  
21 It was a bit unfair for [NIMART] to be introduced in that fashion because there  
22 was no in-service training, there was nothing given. We were dish-upping the

1 medication just like that and, as time went by, we discovered so many things  
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1 medication just like that and, as time went by, we discovered so many things  
2 that we did wrong.  
3

4 Many experienced uncertainty when interpreting abnormal laboratory results, managing  
5 complex co-morbidities or ART-associated adverse events. One 58 year old nurse based  
6 at a small, peri-urban facility, described how uncertain she felt during her first  
7 unsupervised ART initiation:  
8

9 At first it was scary - I was a little bit jittery because I was on my own. I had  
10 mentoring for about a week but when I took over, eh! I started shivering. I  
11 prayed: 'God, help me to go through this thing, I can't go alone on this journey'  
12

13 Conversely, other nurses described receiving support from mentors who were *'just a*  
14 *phone call away'*. Such telephonic support proved crucial as it enabled these nurses to  
15 gain confidence gradually despite minimal on-site mentorship, and provided essential  
16 opportunity for debriefing. Debriefing enabled nurses to re-engage with NIMART after a  
17 patient death had affected their self-confidence:  
18

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

1 patients.

2

3 In contrast, at facilities without telephones, or where up-referral site doctors were

4 *'refusing to come on board'* as mentors, inexperienced nurses described feeling isolated.

5 The inadequate feedback provided by up-referral sites when patients returned to their

6 original PHC facility also left nurses discouraged due to the lost opportunity for skills-

7 transfer. Doctors were perceived as failing to recognise nurses as *'human beings [who]*

8 *really want to communicate with human beings'*. As this 54 year old NIMART-nurse

9 explains:

10

11 I think [doctors] don't understand the importance of the report back. It is a

12 learning tool for a sister so that next time, when you get a patient like this, you

13 know what to do. If they don't send us report how are we going to learn?

14 Because we are not doctors, we are nurses.

15

16 In some facilities where mentorship from supporting partners or up-referral site doctors

17 was lacking, informal 'in-house' mentoring - provided by more experienced NIMART-

18 nurses - emerged as an invaluable means to capacity-build newly trained colleagues. One

19 experienced NIMART-nurse described the impact her 'in-house' mentoring had on

20 programme sustainability at her facility:

21

22 I started alone here as a NIMART-nurse. Now two other [trained] sisters are

23 being mentored by me. They are coming very well. The facility staff

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

3  
4 These 'nurse-mentors' represented a highly acceptable and much needed alternative  
5 source of clinical support. One NGO programme manager, facing limited mentoring  
6 capacity within her organisation, concluded: '*in terms of sustainability, nurses who are*  
7 *competent have to start to mentor their own colleagues*'.

8  
9  
10 ***"Communication is one way down, they tell us what to do....we don't have a say":***

### 11 **Communication, Consultation and Networking**

12  
13 Research participants shared how the DoH's approach to change management had  
14 created anger and confusion amongst some staff. Following minimal consultation, they  
15 were unhappy that '*the [NIMART] programme is failing because we are not involved in*  
16 *planning*'.

17  
18 Facility managers also expressed dissatisfaction regarding 'readiness assessments',  
19 during which senior managers conducted site visits to establish a facility's capacity to  
20 provide NIMART. These visits were perceived as '*just an exercise*' which provided  
21 limited opportunities for staff to communicate their perceived needs and concerns.

22 Several participants were clearly angered by their assessment experience:  
23

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

5  
6 Effective communication between facility-level staff often ameliorated the frustration  
7 arising from inadequate communication between senior management and ground-  
8 level staff. Inter-facility networking provided a-vital opportunity to encourage others  
9 and iron-out programmatic issues. For nurses, regular case-based training meetings  
10 increased their knowledge and confidence and allowed isolated NIMART-nurses,  
11 such as those cited above, to debrief with understanding peers. For facility-managers,  
12 meeting other managers to share skills, ideas, frustrations and experiences assisted  
13 with problem solving.

14  
15 Regular meetings between PHC facilities and up-referral hospital staff also facilitated  
16 NIMART implementation by improving communication, addressing referral pathway  
17 weaknesses and building more supportive inter-collegial relationships. In areas  
18 without regular inter-facility meetings, these relationships remained strained, often  
19 resulting in patients being unnecessarily sent between various facilities due to poor  
20 communication, as this nurse explains:

21  
22 [The up-referral sites] chase patients away. If that patient has a letter from the  
23 clinic they know that for the sister to refer means that they're stuck. We were



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

3  
4 Communication is vital to the success of any health programme, including NIMART.  
5 Inadequate staff consultation during planning impacted staff morale and hindered their  
6 capacity to fully implement NIMART. Contrastingly, effective communication and  
7 positive interactions between different levels of care became a critical component for  
8 task-shifting success.

### 9 10 ***'These little hovels....it's disgraceful, really!': Infrastructure, Support Systems and*** 11 **Innovative Integration Models**

12  
13 Challenges associated with infrastructural shortcomings were ubiquitous, even before  
14 NIMART rollout began, but were often compounded as clinics began dealing with  
15 increasing numbers of ART patients. Staff at clinics with limited space described how  
16 they were *'no longer coping with the number of patient[s]'*, additional stock and extra  
17 services. These infrastructural constraints impacted morale; compromised staff health and  
18 affected clinic efficiency. Poor infrastructure also undermined NIMART-nurses'  
19 | **capacities** to safeguard patient confidentiality during consultations. One nurse shared  
20 her distress about the situation at her facility:  
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3 1 It's not nice. I want to talk about issues - the patient cannot speak loud because  
4  
5 2 there's no space - we are dividing with cupboards or a curtain in one room so we  
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7  
8 3 can see four patients at each corner, which is not right.  
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12 5 Participants also identified various other systems related challenges including: limited  
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14 6 access to off-site investigations such as chest x-rays; cumbersome data collection  
15  
16 7 processes which kept '*changing like petticoats*', out-dated telecommunications systems,  
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18 8 fragmented patient transport services and complicated drug ordering processes. One busy  
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20 9 inner-city clinic manager described her current situation:  
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11 ...now I don't have [ART] medication because when we order it's such a  
12 process. I'm going to take from another site, say[ing] 'give me about three packs  
13 and when I get my stock I'll give you three back'. It's all about starting [patients]  
14 - nobody cares whether the systems are in place.

15  
16 However, some participants described how creative problem solving at facility level  
17 eased NIMART integration, successfully addressing many implementation challenges  
18 whilst minimising disruption to other PHC services. NIMART implementation appeared  
19 to empower these nurses as it allowed them to develop systems which worked for them.  
20 They reported increased job satisfaction and lower levels of concern about staff burnout  
21 and unmanageable stress.  
22

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3 1 Two such integration models particularly captured other participants' imagination when  
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5 2 shared during the group discussions. One clinic established an internal up and down-  
6  
7 3 referral system within which time-consuming ART-initiation patients were managed by  
8  
9 4 the NIMART-nurse. On a rotational basis, every nurse operated as 'NIMART-nurse' for  
10  
11 5 one week. Once stable, ART-patients were 'down-referred' within the clinic to the  
12  
13 6 general PHC nurses who '*kept the chronics* [diabetic/hypertensive patients] *queue*  
14  
15 7 *moving*'. Thus the NIMART-nurse had more time to spend with complex patients whilst  
16  
17 8 well patients could be seen quickly. Stable ART-patients benefited from 'down-referral'  
18  
19 9 because queuing with other 'chronic' patients protected their confidentiality and reduced  
20  
21 10 waiting times. Additionally, as explained by the facility manager, the regular rotation  
22  
23 11 ensured all nurses became NIMART providers, thus strengthening programme  
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25 12 sustainability:  
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34 [Nurses] rotate so that they know everything. I don't get paralyzed when one  
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36 15 sister is not on duty and she's specialising in that role. Three to four people are  
37  
38 16 rotating: ANC, tuberculosis, wellness programme, chronics, ARVs.  
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44 18 Another smaller clinic, with just one NIMART-nurse, was now '*reserving Fridays for*  
45  
46 19 *initiations*' so that he could spend sufficient time preparing these patients.  
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51 21 Thus, although infrastructural shortcomings threatened to undermine NIMART success at  
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53 22 many sites, some facility managers demonstrated remarkable innovation, adapting  
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55 23 integration models to overcome staffing and space constraints whilst minimising  
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1 disruption to existing services. For many participants, NIMART implementation was  
2 perceived as empowering as it enabled them to develop and use systems that worked  
3 within their local context.

## 7 DISCUSSION

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

15 Human resource shortages are a well-recognised hindrance to rapid ART programme  
16 expansion. Considering 40% of nursing posts in South Africa lie vacant [29] and up to  
17 50% of nursing time is consumed by administrative tasks,[30, 31] concerns regarding  
18 over-dependence on nurse-based task-shifting for ART scale-up appear well founded.[13]

19 The importance of expanding lower cadre staff comple<sup>e</sup>ments to perform basic tasks,  
20 traditionally assigned to nurses, has been stressed elsewhere.[8, 17] This study highlights  
21 the sustainability issues created when task-shifting to nurses is undertaken without  
22 providing sufficient ‘down-stream’ staff. Realistic, standardised ‘down-stream’ staffing  
23 levels and revised scopes of practice should be developed and universally

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

8  
9 Quality, safe task-shifting inarguably relies on comprehensive training, mentoring and  
10 on-going quality assurance.[5, 33] Unfortunately, in this study, NIMART-nurses and  
11 managers reported that hasty NIMART implementation had seriously compromised  
12 access to these crucial capacity-building interventions. This undermined individual  
13 nurses' confidence and left many facilities with an unsustainable NIMART programme  
14 where only one nurse had been trained. Providing on-site NIMART training to several  
15 nurses at a facility – as was happening in one district – would address this common  
16 problem. Importantly, despite these difficulties, participants remained optimistic and  
17 identified two further practical interventions which may mitigate this situation. Firstly, a  
18 shift is needed towards fast-tracking nurse-mentor development in which experienced  
19 NIMART-nurses need to be equipped to supervise, support and train colleagues at their  
20 own and nearby facilities. Secondly, nurses require reliable access to telephonic support,  
21 perhaps through greater involvement of doctors at up-referral sites. These interventions  
22 might also address the emotional support and debriefing needs of nurses caring for

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

3  
4 Effective inter-facility communication, mutual support, teamwork and the use of creative  
5 problem solving at the facility-level were all important factors in enabling the successful  
6 implementation of NIMART. ~~Several theoretical~~ benefits of teamwork [15] were  
7 described by participants working in ‘happy’ clinics where NIMART appeared to cause  
8 less disruption, stress and discontent. A culture of teamwork and innovative problem-  
9 solving ~~needs to~~ should be nurtured to better enable nurses and their managers to deal  
10 with NIMART implementation. Establishment and support of quality improvement  
11 teams within facilities may be ~~one means of strengthening this area, particularly at poorly~~  
12 ~~performing facilities, to better enable nurses and their managers to deal with NIMART~~  
13 ~~implementation.~~

14  
15 The human resource and infrastructural constraints described in this study echo problems  
16 widely recognised as hindering ART-programme expansion in resource-limited  
17 settings.[35, 36] Although NIMART can effectively expand ART access it also continues  
18 to restrict service provision to increasingly overcrowded fixed facilities operating with  
19 limited human resources. Therefore, implementation of NIMART in isolation will likely  
20 fail to address the long-term sustainability of South Africa’s ART programme.[37] Task-  
21 shifting to nurses represents just one facet of decentralisation and there remains a need to  
22 look beyond traditional PHC facility-based services towards chronic care models which  
23 involve patients in self-management and community support. Shifting the care of healthy,

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

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#### 14 **Limitations and Future Research**

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

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5 2 Further research is needed to evaluate those clinics and districts which are considered  
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7 3 ‘successful’ in order to better understand NIMART implementation. The behavioural  
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9 4 nuances which enable some to embrace change and overcome challenges need to be  
10  
11 5 better understood as this may inform the development of more sophisticated change  
12  
13 6 management strategies that address resistance to change. On-going difficulties with  
14  
15 7 referral processes indicate a need to develop and implement effective referral system  
16  
17 8 strengthening interventions. One option, which some participants felt enhanced  
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19 9 communication with up-referral sites, was the introduction of regular inter-facility  
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21 10 meetings. This approach should be examined further to establish whether it does indeed  
22  
23 11 improve relationships between staff and thus strengthen referral systems. Standardised  
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25 12 written feedback forms, to be used when patients are referred back to their PHC facility,  
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27 13 should also be developed and piloted to assess any positive impact on referral processes.  
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## 16 CONCLUSION

17  
18 Despite the barriers to, and challenges of, NIMART, the overarching impression  
19 given by participants in this study is a positive one. In particular, whilst those who  
20 had recently started providing NIMART may have tended towards negativity, more  
21 experienced NIMART-nurses expressed greater optimism about the new programme,  
22 suggesting perhaps that perceptions may shift as clinical confidence grows.  
23



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

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For peer review only



**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
<b>Domain 1: Research team and reflexivity</b>		
<i>Personal Characteristics</i>		
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	MBCbB, 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
<i>Relationship with participants</i>		
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.
<b>Domain 2: study design</b>		
<i>Theoretical framework</i>		
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	
<i>Participant selection</i>		
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
<i>Setting</i>		
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
<i>Data collection</i>		
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.
<b>Domain 3: analysis and findings</b>		

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3	<i>Data analysis</i>		
4	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.
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10	25. Description of the coding tree	Did authors provide a description of the coding tree?	Yes
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12	26. Derivation of themes	Were themes identified in advance or derived from the data?	Derived from data
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14	27. Software	What software, if applicable, was used to manage the data?	NVivo 9
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16	28. Participant checking	Did participants provide feedback on the findings?	Due to time constraints participant feedback was not sought.
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22	<i>Reporting</i>		
23	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.
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30	30. Data and findings consistent	Was there consistency between the data presented and the findings?	Yes
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32	31. Clarity of major themes	Were major themes clearly presented in the findings?	Yes
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34	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
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