

Effect of differentiated service delivery models for HIV treatment on healthcare providers' job satisfaction and workloads in sub-Saharan Africa: a mixed methods study from Malawi, Zambia, and South Africa

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Abstract

Introduction: Differentiated service delivery (DSD) models for HIV treatment aim to improve healthcare providers' quality of professional life by reducing the patient/provider ratio and allowing for more time with recipients-of-care in need. We investigate current job satisfaction and perceived changes in job satisfaction among HIV treatment providers in Malawi, South Africa, and Zambia after the adoption of DSD models of care in each country.

Methods: We conducted a concurrent, cross-sectional mixed-methods survey with clinical and non-clinical HIV care providers between April 2021 and January 2022 at public sector clinics in Malawi (n=12), South Africa (n=21), and Zambia (n=12). Questions investigated the effect of DSD models on provider responsibilities, work burden, time allocation, and job satisfaction. We conducted a principal components analysis using questions with responses to create an index score for job satisfaction and estimated odds ratios using logistic regression for associations between key variables and low reported job satisfaction. We reported emerging qualitative themes. We use Herzberg's two-factor theory to organize and interpret the results of the study, identifying motivating factors (which lead to job satisfaction) and hygiene factors (which we refer to as maintenance factors and which lead to dissatisfaction if lacking).

Results: Providers had generally high job satisfaction. Providers from Malawi were more likely to report lower job satisfaction than those from South Africa or Zambia. (adjusted odds ratio (aOR) 4.56, 95% confidence interval (CI) [2.12, 9.80])). Providers who believed their jobs became harder after the introduction of the DSD models (2.82[1.14-6.96]) or did not change (6.50[2.50-16.89]) were more likely to report lower job satisfaction. Qualitatively, providers felt DSD models improved their working conditions by decongesting the clinics and allowed them to spend more time on other tasks. Providers were particularly motivated when they could spend more time with patients.

Conclusion: Findings highlight the importance of DSD models in maintaining or improving healthcare providers' quality of professional life and underscore the need for continued monitoring of the impact of these models on job satisfaction among HIV treatment providers in resource constrained settings.

Introduction

In an effort to improve HIV patients' outcomes on antiretroviral therapy (ART) and make service delivery more efficient, many countries in sub-Saharan Africa (SSA) are scaling up "differentiated service delivery" (DSD) models for HIV treatment (1,2). DSD is a client-centred approach that is intended to simplify and adapt HIV services to better meet the needs of people living with HIV and reduce the burden of HIV care on the healthcare system and patients (3). Common DSD models for ART patients established in care—those who have at least 6 months of experience on ART and are virally suppressed—include community-based medication pickup, which makes access to medications more convenient and less time-consuming; adherence clubs that provide both treatment and social support to groups of patients; and multi-month dispensing of medications to reduce the required number of clinic visits per year. DSD models' design, implementation, and clinical outcomes have been widely documented in recent years (4–9).

A 2018 review of systematic reviews found that patient-centred care interventions can also improve provider job satisfaction (10), which has been defined by previous studies as 'a gratifying and positive emotional state from the appraisal of one's job or experiences' (11). DSD models, in addition to reducing the burden of HIV care for patients, can thus also be expected to increase HIV treatment providers' job satisfaction (11). DSD models may accomplish this by lightening providers' workloads and reducing the ratio of patient visits per provider, thereby allowing providers either to spend more time with HIV patients who are not eligible for DSD models (12) or to invest more time in other responsibilities, such as care for clients with other conditions or administrative duties.

Some previous studies have examined healthcare providers' job satisfaction in sub-Saharan Africa in general (12–15), but none have looked at how DSD implementation affects HIV treatment providers' satisfaction. Guided by Herzberg's Two Factor theory of factors contributing to job satisfaction, we use mixed-methods to systematically investigate current job satisfaction and perceived changes in job satisfaction among HIV treatment providers in Malawi, South Africa, and Zambia after the adoption of DSD models of care in each country, to determine if changes in job satisfaction should be considered an advantage of or, instead, a drawback to DSD implementation.

Methods

Study design and setting

The AMBIT Project's SENTINEL study (16) is a repeated, cross-sectional, mixed-methods survey of differentiated service delivery for HIV treatment at public sector clinics in Malawi, South Africa, and Zambia. It includes surveys of ART patients, HIV testers, and treatment providers. Here we report results from the AMBIT round 1 provider survey conducted between April 2021 and January 2022.

SENTINEL study sites include 12 public sector clinics in Malawi, 21 in South Africa, and 12 in Zambia. Study sites were purposively selected to provide sufficient ART client volumes, variation in settings (rural or urban), and experience with DSD models for HIV treatment. Additional information on study sites is provided in Supplementary Table 1 and in the published protocol (16). DSD models were incorporated into national HIV treatment guidelines in 2018 in Malawi, 2016 in South Africa, and 2017 in Zambia. There were initially a large number of models implemented, each designed slightly differently and often with the support of nongovernmental partners and external funders (7). As countries, implementing partners, and facilities gained experience with DSD, a smaller number of national models were scaled up in each country, with a few bespoke, population-specific models remaining alongside them.

At the time of data collection for this study, the most commonly implemented models were six-month medication dispensing (6MMD) and mother-infant pair in Malawi; facility-based pickup and external pickup points in South Africa; and 6MMD and community ART access points (CAAPs) in Zambia (Table 1).

Table 1. Models of care commonly offered at study sites

Model	Description	# of expected facility visits and other provider interactions per year in DSD guidelines at time of data collection
Malawi		
Conventional care	Clients receive a 3-month supply of medications at each full clinic visit	4 facility visits; 0 other interactions
Six-month medication dispensing (6MMD)	Clients receive a 6-month supply of antiretroviral medications at each full clinic visit	3 facility visits*; 0 other interactions
Mother-infant pair	The post-partum visits for the mother are aligned to the infant visit schedule. Infant's schedule is based on the vaccination milestones. Thereafter the mother receives a 3-month supply of antiretroviral medications at each visit	4 facility visits**; 0 other interactions
South Africa		
Conventional care	Clients receive a 2-month supply of medications at each full clinic visit	6 facility visits; 0 other interactions
Facility-based pickup points	Between full clinic visits, clients pick up medications (usually a 2-month supply) at specified pickup points in facilities	2 facility visits; 4 medication pickups
External pickup points	Between full clinic visits, clients pick up medications (usually a 2-month supply) at specified pickup points in the community (e.g. commercial pharmacy)	2 facility visits; 4 medication pickups
Zambia		
Conventional care	Clients receive a 3-month supply of medications at each full clinic visit	4 facility visits; 0 other interactions
Six-month medication dispensing (6MMD)	Clients receive a 6-month supply of antiretroviral medications at each full clinic visit	3 facility visits; 0 other interactions
Community ART access points (CAAPs)	A lay worker collects 3-month supply of medication for 8 clients and distributes it at a designated CAAP	2 facility visits; 2 other interactions

**The third visit is for viral load review*

*** Visits are not uniform; timing varies depending on the infant's age*

Theoretical framework

Herzberg's two-factor theory, also known as the motivator-hygiene theory, suggests that two distinct and parallel sets of factors contribute to job satisfaction (17,18). Hygiene factors are factors that, if lacking, can cause dissatisfaction among employees, but their presence does not necessarily lead to satisfaction. Examples include job security, salary, and working conditions. For clarity, in this paper, we refer to hygiene factors as maintenance factors.

Motivating factors are those that, when present, can lead to improved job satisfaction and motivate employees to perform at a higher level. Examples include achievement, recognition, responsibility, advancement, and the work itself.

Fundamentally, Herzberg’s theory suggests that satisfaction and dissatisfaction are on different continuums and influenced by different factors, with maintenance factors preventing dissatisfaction and motivating factors driving satisfaction and motivation. Herzberg’s model presumes that individuals often experience motivators and maintenance factors simultaneously, and that these factors cannot influence each other (i.e., motivators cannot increase or decrease dissatisfaction; they can only influence the degree of satisfaction). Understanding that an employee may at once be satisfied and dissatisfied is important to improving the work environment and is highly applicable to our study. Herzberg’s theory has been widely applied in the healthcare, hospitality and tourism(19), utilities, services, retail, manufacturing industries(20), among others, and within varying cultural contexts, including Jordan(21), Sweden(19,22), Saudi Arabia(23), and the United Kingdom(20). A recent systematic review has utilized Herzberg’s factors to frame findings of job satisfaction among primary healthcare providers across the world (24).

We use this theory to organize and interpret the results of this study. Throughout, we consider any response that allows providers to spend more time with patients as a Motivating Factor (work itself, time spent with patients) and time for all other tasks as a Maintenance Factor (working conditions, time for other tasks) (Table2).

Table 2. Herzberg’s Two-factor Theory and its application to our analysis

Variable	Definition	Herzberg theory factor examples (applications to our study)
Maintenance factors (Hygiene)	Necessary to not be dissatisfied, but do not necessarily lead to satisfaction	Job security Working conditions (e.g. time for tasks, burn out from overwork) Compensation
Motivating factors (Motivators)	When present, can lead to improved job satisfaction	Achievement Recognition (e.g. meeting DSD targets) Responsibility Advancement (e.g. training opportunities) Work itself (e.g. intrinsic motivation from relationships with patients, time predictability)

Participants and data collection

At each study site, facility operations managers identified and referred to the study staff up to 10 healthcare workers who had been employed at the facility for at least 6 months and directly or indirectly involved in the implementation of ART and DSD models. Potential survey participants included facility operations managers, nurses, lay counsellors, community health workers (CHWs), pharmacists, pharmacy assistants, expert clients (individuals living with HIV who assist others in navigating HIV care) (25), and other cadres involved in DSD for HIV treatment. Study staff introduced the study, conducted the written informed consent process, and then administered the survey to the participants individually in a private area at the facility during a time that was convenient for the respondent.

Data were captured on tablets. Responses to qualitative and open-ended questions were typed verbatim into the tablet by the data collector.

Measurements

The survey instrument (supplementary file 1) included open- and closed-ended questions pertaining to providers’ experiences with DSD model implementation. The survey questions encompassed provider involvement in DSD models offered at the facility, their opinions regarding DSD models, and the challenges they faced in implementing them, as well as how DSD models affected their job responsibilities, time allocation, and job satisfaction. All participants were

asked about their current experience delivering care with the DSD models. Participants who had been engaged in service delivery before DSD models were available were also asked about changes they had observed since DSD had been introduced.

To capture the effect of DSD models on job satisfaction, survey participants responded to 7 statements that were developed by the study team on the effect of DSD models on their job satisfaction using 5-point Likert scale responses with options of strongly disagree, mildly disagree, neither agree nor disagree, mildly agree and strongly agree. The statements assessed participants' job satisfaction, joy, relationships with other colleagues and senior management, and relationships with patients since the facilities began offering DSD models.

Quantitative analysis

We first generated descriptive statistics for participants' work characteristics, their roles and involvement in DSD models, their views on the effect of DSD models on their job responsibilities and job changes after DSD implementation. We next conducted a principal component analysis (PCA) to create an index for job satisfaction from the 7 Likert scale questions. The final scale's reliability was determined using a Cronbach's alpha coefficient of 0.60, with factors loading above 0.60 were retained for subsequent regression analyses. We categorized the final mean satisfaction scores as "high" satisfaction (score >4) or "low" satisfaction (score \leq 4) in order to simplify interpretation. We then used logistic regression to examine univariate and adjusted associations between key predictor variables and low reported job satisfaction. Significance was considered at $p < 0.05$, confidence intervals (CI) of 95%.

Qualitative analysis

For qualitative responses to open-ended questions, a codebook was developed inductively for each question by reading through at least 60% of responses. Codes were developed and refined and concepts collapsed or separated based on the content of the responses as coding proceeded. Once a codebook was finalized, each question was reread and assigned all relevant codes. Additional codes were added to the codebook if needed as they arose from the data. During analysis of each open-ended question, codes were compared by country and provider cadre (clinical vs. non-clinical); those with the highest volumes were identified as major themes in the data. Notable divergent views were identified and reviewed by the study team to reach concurrence. Results were summarized and quotes were identified within each stratum as illustrative examples. Some quotations were edited slightly for grammar and clarity. Results were triangulated with quantitative findings and interpreted within the Herzberg Two Factor Theory.

Results

Participant characteristics and work responsibilities

We enrolled a total of 468 participants: 142 providers from Malawi, 206 from South Africa, and 120 from Zambia. Nurses comprised the largest cadre in the study (40% of providers), followed by lay counsellors and community health workers (CHWs) (26%), and administrators and data clerks (13%) (Table 3).

Of the 468 participants enrolled, 364 (78%) had provided HIV care before DSD scaleup and could therefore offer a comparison of their experience before and after DSD implementation. Table 3 reports characteristics for this subset as well as for each country's sample as a whole.

Table 3. Work characteristics of survey participants

Characteristic*	Total		Malawi		South Africa		Zambia	
	All providers	Provided care pre-DSD*	All providers	Provided care pre-DSD	All providers	Provided care pre-DSD	All providers	Provided care pre-DSD
N	468	364	142	136	206	158	120	70
Cadre, n (%)								
<i>Doctor, clinical officer, or medical officer</i>	53 (11%)	44 (12%)	36 (25%)	34 (25%)	1 (0%)	1 (1%)	16 (13%)	9 (13%)
<i>Nurse</i>	187 (40%)	154 (42%)	49 (35%)	47 (35%)	111 (54%)	91 (58%)	27 (23%)	16 (23%)
<i>Pharmacist or assistant pharmacist</i>	30 (6%)	17 (5%)	1 (1%)	1 (0%)	18 (9%)	14 (9%)	11 (9%)	2 (3%)
<i>Laboratory staff</i>	15 (3%)	13 (3%)	12 (8%)	11 (8%)	0 (0%)	0 (0%)	3 (3%)	2 (3%)
<i>Administrative clerk or data capturer</i>	60 (13%)	35 (10%)	13 (9%)	12 (9%)	29 (14%)	15 (9%)	18 (15%)	8 (11%)
<i>Lay counsellor or community healthcare worker</i>	123 (26%)	101 (28%)	31 (22%)	31 (23%)	47 (23%)	37 (23%)	45 (38%)	33 (47%)
Years' work experience, median (IQR)	7 (3-11)	8 (4, 12)	6 (3-10)	8 (4, 12)	8 (5-12)	8 (4, 12)	4 (2-10)	7 (3, 11)
Years at facility, median (IQR)	4 (2-9)	5 (3, 10)	4 (2-8)	5 (2, 10)	5 (2-9)	5 (2, 10)	3 (1-9)	5 (2, 9)
Reported direct involvement with DSD implementation	389 (83%)	313 (86%)	142 (100%)	136 (100%)	128 (62%)	108 (68%)	119 (99%)	69 (99%)
Reported that DSD models have affected job, such as responsibilities, work load, hours, n (%)***	-	277 (76%)	-	107 (79%)	-	105 (66%)	-	65 (93%)
No change perceived after DSD implementation, n (%)***	-	87 (24%)	-	29 (21%)	-	53 (34%)	-	5 (7%)

*Age and sex of respondents were not collected.

**Characteristics of providers who reported providing HIV care at a time when other models of treatment delivery were not being offered?

***Percentages refer to the proportion of providers who provided HIV care at current facility prior to DSD implementation.*

Provider workloads and job responsibilities

Among the subset of providers who could compare experiences before and after DSD implementation (n=364), most providers reported that DSD models led to shorter queues, seeing fewer patients per day, and increased time spent with individual patients, especially among providers in Zambia (Figure 1; Supplementary Table 3 for results by cadre).

Figure 1. Reported job changes after DSD implementation among providers who provided HIV care at current facility prior to DSD implementation in Malawi, South Africa, and Zambia (n=364)

Qualitatively, respondents in all three counties overwhelmingly reported reduced workloads as a result of DSD implementation (Table 4). They described the clinics as being "less congested" due to the DSD models diverting patients to external dispensing points, dispensing multiple months of medication at once so that patients make fewer visits to the facility, and/or the management of stable ART patients in a dedicated DSD space, separate from unstable or complex patients with comorbidities. Respondents felt that clinic decongestion, a Maintenance Factor, led to shorter queues of patients, meaning that providers see fewer patients daily, thereby reducing their workload and giving them more time to allocate to other Maintenance and Motivating Factors. Respondents indicated that they are now able to spend more time with patients, which has led to better relationships with the patients. They also reported being able to allocate time to administrative tasks indicating that they felt the work was being completed properly (Table 4).

Table 4. Healthcare worker perspectives on how DSD implementation has affected their workload and time spent at work from Malawi, South Africa and Zambia

Effects on time spent at work	Illustrative quotes
Spend more time with patients (Motivating factor: work itself)	<i>"...[The] number of patients that visit the facility has reduced as a result of models because every patient comes on his or her own specified day which reduces workload and enables me to have enough time with an individual patient"- Professional nurse, Malawi</i>
	<i>"[The DSD Models have] lessened the workload. Previously we couldn't spend more time with an individual client but now we do, so thanks to the DSD models we even have a good relationship with the clients." – Site operations manager/facility in-charge, Zambia</i>
More time allocated to administrative duties (Maintenance factor: working conditions)	<i>"[I] consolidate monthly stats and retrieve files for pre-booked patients for the week." – Admin clerk, South Africa</i>
	<i>"Now, we are able to look at registers and other administrative duties properly. A long time ago when there were no DSD models, I believe it used to be crowded here. And that meant a lot of us providers didn't have enough time to do other administrative work properly." – Professional nurse, Zambia</i>
More time to other ART-related tasks (Maintenance factor: working conditions)	<i>"I use extra time to write reports and do patient tracing." – Lay counsellor, Malawi</i>
	<i>"I go through my daily patients register, checking those who didn't come for their appointments, then I call to remind them about their appointments. If the call is unsuccessful, I do the physical visit." – Staff nurse, South Africa</i>
More time spent assisting other departments (Maintenance factor: working conditions)	<i>"I use the extra time to work at antenatal and labour ward." – Staff nurse, Malawi</i>
	<i>"I get to see other patients who are not on DSD models like acute patients." – Professional nurse, South Africa</i>
Other changes in workload (Maintenance factor: working conditions)	<i>"The workload is lighter than previously. Stock holding is less. Ordering is more stable than before as previously I would go to sister clinics to borrow what I didn't have as I always ran short due to the influxes of patients." - Pharmacy assistant, South Africa</i>

A minority of providers across the three countries said that they worked shorter hours after DSD implementation (24% Malawi, 7% South Africa, 41% Zambia) or that DSD models required them to spend more time on administrative duties (10% Malawi, 22% South Africa, 30% Zambia).

In qualitative results, providers principally described having additional time for routine administrative duties and management tasks, including updating and organizing files, preparing for the next day's patients, entering, cleaning and analysing patient and facility data, writing reports, and conducting audits. Many nurses and some doctors in the three countries discussed assisting colleagues in other wards/departments, particularly the outpatient department and antenatal and labour wards. Non-clinical providers mentioned providing additional ART patient support and tracing, including reviewing registers to track upcoming and missed appointments, calling patients, and conducting additional testing and counselling.

Most providers from South Africa and Zambia did not receive additional compensation (salary or overtime payments for weekends or benefits) as a result of having DSD models at their facilities, but 71% of healthcare providers from Malawi reported receiving extra compensation such as lunch and transport allowances.

Provider job satisfaction

Providers generally reported high levels of job satisfaction related to DSD implementation. 84% of providers from Zambia, 64% from South Africa, and 50% from Malawi had medium to high levels of satisfaction. Providers in all three countries agreed that DSD models made them like their job more, improved how time was spent, and improved relationships with clients. Most reported that DSD implementation did not reduce their working hours, and the perception of DSD implementation on providers' getting more breaks and personal time varied across countries (Malawi: 60%; South Africa: 49%; Zambia: 81%)

Table 5. Components of job satisfaction among providers who delivered care prior to DSD model implementation and summary of principal component analysis

	Malawi (N=136)	South Africa (N=158)	Zambia (N=70)
Agree/strongly agree with the following components of job satisfaction, n (%)			
<i>I like my job more now</i>	131 (96%)	144 (91%)	69 (99%)
<i>Patients who are in other models of treatment are more polite or more friendly than those who are not</i>	66 (49%)	100 (63%)	48 (69%)
<i>Having other models of treatment delivery available has improved my relationship with patients</i>	122 (90%)	133 (84%)	69 (99%)
<i>I am more satisfied with my job than I was</i>	117 (86%)	116 (73%)	64 (91%)
<i>Having other models of treatment delivery has made my relationships with colleagues in the facility better</i>	104 (76%)	129 (82%)	60 (86%)
<i>Having other models of treatment delivery has made my relationships with senior management better</i>	96 (71%)	108 (68%)	63 (90%)
<i>I feel happier overall (in my life) than I used to</i>	107 (79%)	123 (78%)	68 (97%)
Overall level of satisfaction*, n (%)			
<i>High</i>	68 (50.4)	100 (63.7)	59 (84.3)
<i>Low</i>	67 (49.6)	57 (36.3)	11 (15.7)

*Overall satisfaction was determined using principal component analysis of the preceding 7 questions: high satisfaction indicates scores greater than 4 and low satisfaction indicates scores less than or equal to 4.

Providers from Malawi were more likely to report lower job satisfaction than those from South Africa or Zambia (adjusted odds ratio (aOR) 4.56, 95% CI [2.12, 9.80]) (Figure 2). Providers who believed their jobs became harder after the introduction of the DSD models (2.82 [1.14-6.96]) or did not change (6.50 [2.50-16.89]) were also more likely to report lower job satisfaction, particularly in South Africa. Those who had responsibilities in three or more DSD models (1.50 [0.78-2.88]) and experienced pressure to enrol patients in DSD models (2.03 [0.97-4.26]) trended toward association with lower job satisfaction.

Figure 2. Crude and adjusted odds ratios of factors associated with low job satisfaction among healthcare workers in Malawi, South Africa, and Zambia

Nearly all respondents across the countries reported in their open ended (qualitative) responses that DSD models made their jobs easier. They reported that the decongestion of the clinics resulted in fewer patients managed each day, a reduced workload, less stress, a more organized work environment that allows for better planning and teamwork, and more time for other work (maintenance factors). Providers also described being satisfied with their jobs because they were passionate about helping patients and felt the decanting of patients allowed them to spend more time with each patient and provide higher quality care, a motivating factor (Table 5).

Table 6. DSD model-based reasons for respondents' higher/lower job satisfaction, categorized by Maintenance or Motivator

Emerging theme categorized by factors	Illustrative quotes
<i>Maintenance factors (can cause dissatisfaction if lacking)</i>	
Decongestion of facilities, more time to reallocate to administration and other tasks (working conditions)	<i>"DSD models have decongested the facility which has led to my job being more efficient and effective. It has also helped me meet my individual and facility targets, which has led to my Job satisfaction."</i> - Facility Manager, Zambia
Better structure and management of staff (working conditions)	<i>"There is more structure and the role of the staff are more defined, more accountability and even the monitoring are more defined and the report are more accurate"</i> - Facility Manager, South Africa
	<i>"... In terms of human resources, the ratio has become proportional, time has also been managed."</i> - Professional Nurse, Zambia
<i>Motivating factors (can influence degree of satisfaction)</i>	
Feeling pressure to enrol patients on DSD models and high targets to meet (achievement)	<i>"The pressure to have more clients virally suppressed and enrolled on DSD model."</i> – Pharmacist, Zambia
	<i>"Unrealistic targets that are set"</i> -Professional Nurse, South Africa
DSD models have made jobs easier, allowed for more time with clients (work itself)	<i>"My work has become easier now because the DSD's have been categorised ..."</i> -Expert Client, Malawi
	<i>"In terms of my work schedule, now my work schedule is not stressful and because of that I spend much time with my patients thereby making me so satisfied."</i> - Professional Nurse, Malawi
Predictability of work responsibilities (responsibilities)	<i>"I know in advance the kind of patients am to see on the particular day so it enables me to prepare"</i> - Adherence Support Officer, Malawi

Numerous providers discussed the clinic being better managed, organized, and/or more appropriately staffed after the introduction of the DSD models. Multiple providers described the DSD models creating a more organized work environment because they can better plan and know ahead of time which kinds of patients are coming on which days. In addition, a few providers explained that clinic staff have clearer, more definite roles with greater accountability, resulting in improved clinic management.

Respondents who were less motivated explained that they had higher workloads and experienced pressure to meet facility targets, such as achieving viral suppression in patients, enrolling patients into DSD models, and retaining patients in care. They described the targets as being "unrealistic" and explained that their job performance was measured against these targets. These responses were similar among doctors, nurses, and other staff cadres. Some

providers also described feeling pressure and/or dissatisfied because of insufficient resources at the facilities (particularly human resources due to staff shortages or absenteeism), the challenges of patient adherence, and difficulties with patients not understanding the purpose of DSD models. A higher proportion of South African (23%) nurses reported pressure to enrol patients into DSD models, compared to Malawi (4%) and Zambia (0%) nurses (see Supplementary Table 3).

Discussion

Healthcare providers' job satisfaction and perceptions of their workloads have been found to affect the quality of care provided and clients' treatment outcomes (26,27), as well as providers' willingness to remain in their positions (15,28). In this survey of healthcare providers' job satisfaction and workloads in Malawi, South Africa, and Zambia, providers reported generally higher job satisfaction and a positive change in their workloads after the introduction of differentiated service delivery for HIV treatment.

Herzberg's two-factor theory suggests that maintenance factors (i.e., factors that, if lacking, can cause dissatisfaction, but whose presence does not necessarily lead to satisfaction) and motivating factors (i.e. factors that when present, can lead to improved job satisfaction and motivate employees) are independent and that employees can therefore be satisfied and dissatisfied at the same time (17,18). Our results suggest that, from the perspectives of health workers in Malawi, South Africa and Zambia, the introduction of DSD models primarily affected maintenance factors. Most survey respondents indicated that DSD models reduced their workloads and made their jobs easier, and that the decongested clinics resulted in less stress and more time for needier clients and for administrative tasks. Providers attributed the decongestion of clinics to the existence of external dispensing points and multi-month dispensing. Respondents from South Africa were more likely to link their job satisfaction with the improvement in facility management and organization that came with the introduction of DSD models, which allowed for streamlining of clinic services. Across the three countries, providers highlighted fewer ART patients, sufficient space for other waiting patients, and clearer roles for providers resulting in greater accountability as DSD-associated improvements.

Importantly, DSD models also affected several motivating factors. DSD models, via clinic decongestion, allowed providers to spend more time on their clinical work and offered opportunities to pursue more training. In Malawi, respondents linked satisfaction with their job to being able to provide patients with better care and to improvements in provider-patient relationships. This finding was very similar to reports from Zambian respondents who linked their satisfaction to being able to offer better quality of care to patients and to spend more time with individual patients. Being able to spend sufficient time with individual patients has been found to be an important contributor to provider satisfaction in other settings (29).

Our findings support the ex-ante expectation that the introduction of DSD models will reduce the ratio of patient visits per provider, thereby allowing providers to spend more time with patients who are not eligible for DSD models (30). Our results also add to the existing body of research on self-reported provider workload following DSD implementation in other sub-Saharan African countries. Healthcare workers from Eswatini reported decreased workload, reduced clinic congestion, and shorter patient waiting times following the implementation of DSD models (31). Providers in Mozambique reported an overall improvement in quality of care due to reduced provider workload, which allowed them to attend to more complicated patients(32). In a small qualitative study in Zambia, most providers preferred dispensing ART medications over a six-month period rather than three months, aligning with patients' clinical appointments. These providers also perceived significant benefits related to reduced workload, ability to see unstable patients, and decongested clinics (33).

Although most responses were positive in terms of working conditions, a minority of respondents in all three countries stated that the introduction of DSD models reduced their job satisfaction, due mainly to additional administrative duties and lack of human and financial resources at their facilities. This was more commonly reported by South African respondents and mirrors findings from studies in Zimbabwe (34) and Eswatini (31), in which providers reported that having to fill prescriptions for community-based models added to their job burdens.

In our study, those who did not perceive any changes in their jobs after DSD implementation were more likely to report lower job satisfaction. To the extent that lack of change reduced satisfaction, it seems likely that providers did anticipate changes, and some were disappointed to find their expectations unmet. Improving the information offered to healthcare providers before DSD adoption may help to limit this outcome. The specific structure of the DSD models in use—for example, whether the models are facility- or community-based and healthcare providers' responsibilities for them—may also be an important determinant of satisfaction. We also found that those who felt more pressure to enrol patients in DSD models were more likely to report lower job satisfaction. The qualitative results revealed that providers felt differently about the targets to enrol patients in DSD. Some seemed to find this motivating, increasing job satisfaction, and others disliked the pressure, reducing job satisfaction.

Pressure to enrol patients in DSD models is likely coming from both government health agencies and international funders, which can set formal or implied targets for DSD enrolment (35–37). Whether the pressure perceived by providers improves uptake among eligible clients or instead leads to enrolment of ineligible or unwilling clients is unclear. Concern about under-enrolment of eligible clients in models that have been demonstrated to improve client satisfaction and reduce both client and provider costs is understandable, and enrolment targets may help address this concern. On the other hand, pressure to meet enrolment targets may compromise provider adherence to the principles of patient-centred care by not offering choices to patients and/or ignoring clinically appropriate eligibility criteria. It may also mask the benefits of DSD models and cause providers to regard them as burdensome rather than helpful and to influence clients' own knowledge and perceptions of DSD. Targets to enrol in one DSD model rather than another also risks reducing client satisfaction and retention in care. While these issues remain speculative, our results indicate that enrolment pressure does reduce job satisfaction for some providers.

Our survey had a number of strengths, including using mixed methods and collecting data from providers at 42 diverse facilities in three countries. Our approach comes with important limitations, however. Our total sample size, while larger than in many of the other studies cited, was small and precluded stratification by provider characteristics other than country and staff cadre. Like all the other studies cited above, moreover, our analysis relied on self-reported responses from providers with regard to both satisfaction and workload. Recall bias is likely, as the original adoption of DSD models occurred at least a year before the survey at most study sites. Satisfaction itself is challenging to measure and compare (27), particularly in a cross-sectional survey, due to its close relationship to individual experiences and expectations and to its potential to vary from day to day, in response to short-term circumstances.

In addition, we did not observe or measure to what extent providers' actual workload changed as a result of DSD implementation or the uses that were made of any "freed up" time. It is likely that some re-allocation of provider time resulted in the delivery of more or better-quality care, while some was likely used less productively. Quantitative analysis of time-and-motion data, longitudinal ratios of staff to clients before and after DSD scaleup, and data on outcomes of clients not enrolled in DSD models will be needed to confirm self-reports of the value of freed-up time.

Conclusion

DSD models have the potential to benefit not only the patient but the provider experience. In our study sample, the introduction of DSD models seems predominantly and positively to have impacted maintenance factors, particularly

working conditions. This is fundamental to preventing dissatisfaction; though by itself it cannot improve satisfaction, it is a necessary precursor to it. For most respondents, moreover, DSD models allowed more time with their patients, a motivating factor that is well known to improve provider satisfaction by creating a greater sense of fulfilment and purpose in their work (29). Future rounds of the SENTINEL study will explore questions of provider satisfaction and workloads over time and the role of ongoing DSD model scaleup in influencing provider satisfaction.

Abbreviations

SSA: sub-Saharan Africa

DSD: differentiated service delivery

ART: antiretroviral therapy

6MMD: six-month medication dispensing

CAAPs: community ART access points

Declarations

Ethics approval and consent to participate

Ethical approval to conduct this study was granted by University of Witwatersrand (Medical) Human Research Ethics Committee in South Africa (Protocol M210241), the National Health Science Research Committee (NHSRC) in Malawi (protocol 21/03/2672), ERES Converge Institutional Review Board in Zambia (Protocol 2021-Mar-012), and by the Boston University Medical Campus Institutional Review Board in the United States (Protocol H-41402). Data collectors were trained in research ethics, the overarching study, and the specific survey instrument. Written informed consent was obtained from each participant before the survey commenced.

Consent for publication

Not applicable.

Availability of data and materials

All data used in this study were collected by the study team following written informed consent. Data will be made available within one year after the closure of the study by the supervising ethics committees. At that time, data will be posted in a public data repository.

Competing interests

The authors report no competing interests. PM and RN are employees of the Ministry or Department of Health in their respective countries and thus have some supervisory authority over the study sites.

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Authors' contributions

IM, SR, AH, SP, TT, and BP conceptualized the study. IM, SR, AH, SP, TT, and BP contributed to instrument design. VN, JLK, NS, AH and IM analyzed the data. VN, BP, AH, AM, IM, NS, and SR drafted the manuscript. All authors reviewed and approved the final manuscript.

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Figures

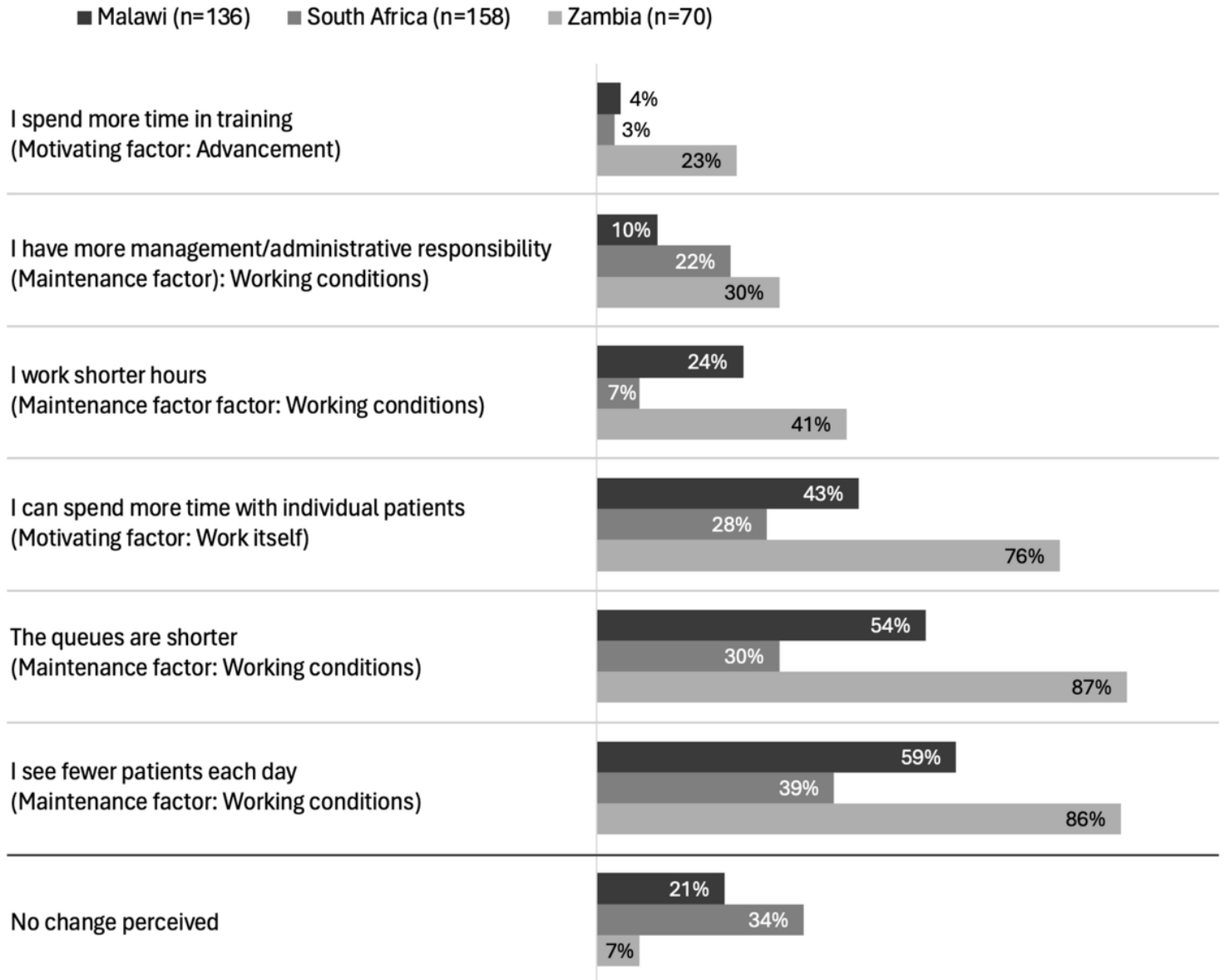


Figure 1

Reported job changes after DSD implementation among providers who provided HIV care at current facility prior to DSD implementation in Malawi, South Africa, and Zambia (n=364)

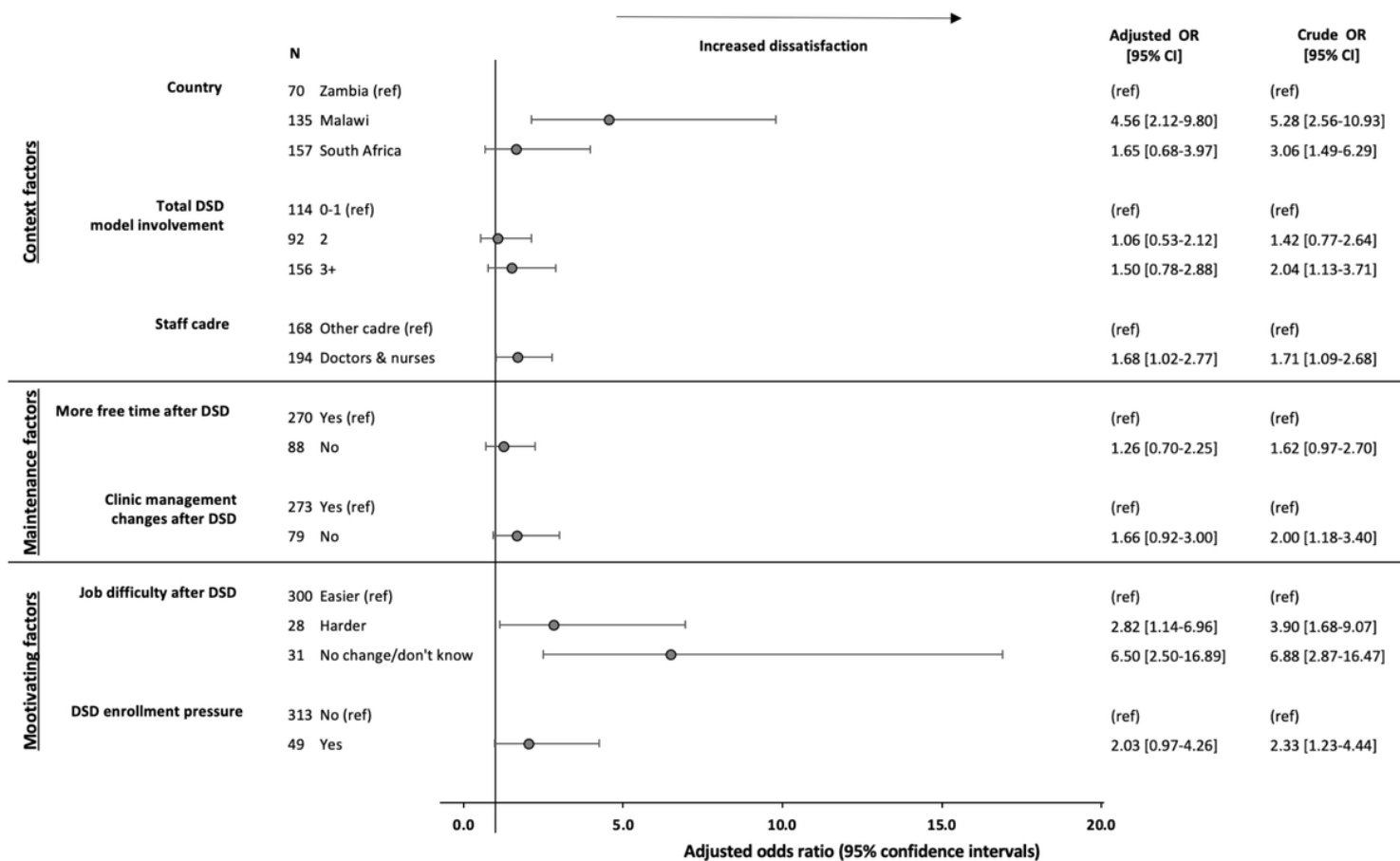


Figure 2

Crude and adjusted odds ratios of factors associated with low job satisfaction among healthcare workers in Malawi, South Africa, and Zambia

Supplementary Files

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