

Job satisfaction among community drug distributors in the Mass Drug Administration programme in Nigeria: a cross-sectional study

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Background: Despite having one of the largest human resources for health in Africa, the delivery of neglected tropical disease (NTD) health interventions in Nigeria has been hampered by health worker shortages. This study assessed factors associated with job satisfaction among community drug distributors (CDDs) supporting the Nigerian NTD programme, with the goal of identifying opportunities to improve job satisfaction in support of NTD control and elimination efforts in Nigeria.

Methods: A health facility-based cross-sectional survey was conducted in 2019 among CDDs in two states with sharply contrasting NTD programme support, Kaduna and Ogun. A multivariate logistic regression model was used to determine the association between respondent characteristics, programme delivery modalities and job satisfaction.

Results: Overall, 75.3% and 74.0% of CDDs were categorised as being satisfied with their job in Kaduna and Ogun states, respectively. The component with the highest reported satisfaction was motivation, where 98.9% and 98.6% of CDDs were satisfied, in Kaduna and Ogun, respectively. Participants were least satisfied with remuneration, communication, supplies and materials, as well as workload. Location (rural/urban) and state, years of experience, who delivers training and reimbursement of transport fare during medicine distribution were significantly associated with job satisfaction.

Conclusions: Including multiple health staff and NTD programme cadres in CDD training and providing remuneration to cover transport fares spent during MDA delivery may improve CDDs' job satisfaction both in Ogun and Kaduna states. Given these two states are at opposite ends of the programme support spectrum, such adaptative measures might help improve CDD job satisfaction in the wider Nigerian NTD programme context.

Keywords: community drug distributors, job satisfaction, logistic regression, mass drug administration, neglected tropical diseases, preventive chemotherapy.

Introduction

The shortage of human resources for health has been reported as one of the barriers to scaling up global health system responses to priority health interventions in Africa.¹ As a result, community participation in healthcare delivery using community health workers (CHWs) is seen as vital to disease prevention and control efforts in low- and middle-income countries. For neglected tropical diseases (NTDs), mass drug administration (MDA) programmes, known in Nigeria as Mass Administration of Medicines, the involvement of community volunteers known as community drug distributors (CDDs), complements the work of health personnel at the community level.^{2,3}

In Nigeria, CDDs are frontline implementers, selected by their communities to participate in large-scale community-based medicine distribution. CDDs are trained on case definition and diagnosis for preventive chemotherapy (PC) NTDs and are introduced to all the tools needed to administer PC medicines. Thereafter, they are expected to conduct village censuses, liaise with health workers, maintain medicine inventories, ensure intake of the correct medicine dose and appropriately refer community members with therapeutic or adverse effects to the health centre.⁴ To ensure sustainability, communities were given responsibility for providing incentives (either in cash or in kind) to their CDDs for 'volunteering' their time.⁴

Despite their commitment to NTD intervention delivery, the literature indicates that CDDs are faced with a myriad of challenges across different countries including poor incentives and lack of motivation, competing activities and incentives between programmes, and high attrition, as well as an inadequate number of trained implementers.^{4,5} In Imo and Abia States of Nigeria, it was reported that 35.3% and 65.1% of trained CDDs are no longer willing to undertake their role, respectively.⁶ The high CDD attrition rate in Nigeria has been traced to low levels of motivation and satisfaction.^{6,7} As key implementers of MDA campaigns, CDDs' personal satisfaction is important to support retention, which in turn is critical to achieving the 2021–2030 NTD prevention, control, elimination and eradication targets.⁵

Job satisfaction can be defined as the positive feelings people have towards their job⁸ and, in the health sector, it is a product of quality of services delivered as well as satisfaction enjoyed by health workers in their job.^{9,10} Previous studies have identified that health worker job satisfaction is influenced by interrelated factors, including relationships with coworkers, hours worked, years of experience, workload, benefits, pay, equipment and material availability and communication.^{11–14} Evidence on CHW satisfaction suggests that this is influenced by the availability of transportation to households and health centres, relationships with other health workers and communities, as well as the training received.^{9,15,16}

However, there is limited evidence about job satisfaction among CDDs in the Nigerian NTD programme. This study sought to assess the factors associated with job satisfaction among CDDs in the Nigerian NTD MDA programme in two states with sharply contrasting programme support, with the goal of identifying opportunities to improve job satisfaction in support of NTD control and elimination efforts in Nigeria and beyond.

Materials and Methods

Study setting

A cross-sectional study was conducted among CDDs in two states of Kaduna and Ogun during March and April 2019. These states were selected to reflect diversity of culture, language and ethnicity, range of contexts, such as urban and rural localities, progress in NTD control and because they represented two extremes in terms of NTD programme support and implementation context. Kaduna State is in North-West Nigeria, with an estimated population of 6.1 million people, consisting of 51% males and 49% females. It has 23 local government areas (LGAs) and >60 ethnic groups. Literacy rates are 44.2% for women and 65.0% for men.¹⁷ The main religions are Christianity and Islam, a demography reflecting a broader picture of Nigeria. Ogun State is in South-West Nigeria, with 3.8 million residents, consisting of 50.3% males and 49.7% females. The state has 20 LGAs and a high literacy rate of 86.7% of women and 84.7% of men.¹⁷ The main religions in Ogun State are predominantly Christian and Muslim, with some families having the two coexisting among them. The state shares a country border with the Republic of Benin to the west.

In terms of NTD programme implementation, Kaduna State is endemic for all five of the PC NTDs (lymphatic filariasis, onchocerciasis, schistosomiasis, soil-transmitted helminthiasis and trachoma) and has received considerable and sustained donor and technical support from international non-governmental development organisations (iNGOs) to implement its NTD programme. As a result, NTD programme implementation is relatively well resourced and supported, with much progress achieved in its NTD control and elimination efforts.¹⁸ Ogun State is endemic for all the PC NTDs found in Kaduna, except for trachoma, and is considered an 'orphan' state when it comes to donor and technical support for NTD programme implementation. Ogun has received sporadic support from iNGOs over the years and is at the early stages of implementing an integrated NTD programme.¹⁸

Sample size and procedure

Four LGAs were included in the study, two in Kaduna (Kaduna North and Kuru) and two in Ogun (Ijebu-Ode and Imeko-Afon), purposively selected to reflect disease endemicity, geographic and cultural context. From each LGA, 10 health facilities were randomly selected and 15 CDDs were further randomly sampled from a list of trained CDDs who took part in the MDA prior to data collection. However, because of high variance in the number of CDDs in each health facility and to achieve better representation in our sample, larger samples were drawn from larger health facilities to compensate for smaller health facilities with <15 CDDs to reach our required sample size per LGA. The sample size was calculated for a simple random sample based on the expected proportion of job satisfaction using the formula:

$$n = \left(Z_{\frac{\alpha}{2}} \right)^2 (1 - p) / d^2$$

where

n = the number of the sample needed for the study,

z = 1.96 for 95% CI,

p = proportion of job satisfaction and

d = margin of error.

Given the lack of published quantitative estimates of job satisfaction among Nigerian CDDs, we used 44.2% job satisfaction, as reported by healthcare providers at public health institutions in the Harari region, eastern Ethiopia.¹⁰ We considered 6% margin of error ($d=0.06$) and a non-response rate of 10%, yielding a sample size of 292, rounded up to 300 per location. The number of health facilities selected was limited to 10 per LGA per state to make it manageable and efficient for the field teams.

Data collection procedure

A structured questionnaire was used to collect information on participants' sociodemographic characteristics and MDA-related information (e.g. CDD years of experience, duration of recent MDA activities [days]), area type (state/county border areas that are remote locations with potential implications for CDD satisfaction), who delivered the CDD training and whether transport fares were received during training and/or during medicine distribution. Data on household assets and characteristics were also collected to estimate CDD socioeconomic status. Functional disability was assessed using the Washington Group Short Set of Questions covering six functional domains (seeing, hearing, walking or climbing [lower body], remembering or concentrating, washing or dressing [upper body] and communication).¹⁹

To measure job satisfaction, we adapted the Spector Job Satisfaction Survey (JSS)²⁰ to suit the context of the NTD MDA programme. The 36 items of the Spector tool were modified and further broken down into sub-items that encompassed the CDD experiences of MDA, thus enabling a more accurate measure of job satisfaction for this specific group. The final questionnaire consisted of 51 five-point Likert-scale questions (hitherto referred to as 'items'), ranging from 1 (strongly disagree) to 5 (strongly agree). The five-point Likert scale gives respondents an option to be neutral (instead of an alternative that does not reflect their thinking and feelings), whereas having more than five points in the response scale provides little extra utility²¹ (see Supplementary Data 1 for the survey tools).

Items were grouped into 10 job satisfaction components: remuneration; career progression; supervision; motivation; supplies and materials; communication; training and guidelines; working relationship; workload reporting; and others (adequacy of living accommodation and child's education and feeling of safety when carrying out the CDD role) (See Supplementary Data 2). The questionnaire was pretested, adjusted for clarity and administered to selected participants by a team of trained enumerators. Data collection was carried out from 21 March to 20 April 2019.

Data management and statistical analysis

Data were coded and analysed using the Stata version 17.0 (Texas, USA) statistical package. A socioeconomic household Equity Tool asset-based index (comprising electric iron, fan, television, refrigerator, generating set, cable TV, electricity, wall material, floor material, type of cooking fuel and household member having a bank account) based on the Nigerian Equity Tool was built using principal component analysis to assign respondents to a wealth quintile (Q1 poorest to Q5 least poor).²² Disability status (functional disability=yes) was determined based on those

who reported having at least some difficulty performing at least two of the six actions included. To capture potential non-linear associations, and for ease of interpretation, age was treated as a categorical variable, reflecting broad age categories of young (<30 y), middle aged (30–40 y) and older people (>40 y).

Reverse scoring was conducted to recode responses with negatively worded questions (5=strongly disagree to 1=strongly agree).²⁰ To estimate the overall level of job satisfaction of each individual, the mean value of all the components was estimated and used as a cut-off value, from which a binary variable was generated that categorised participants into satisfied (mean score>3.5) or dissatisfied.²³ Internal consistency reliability was estimated using Cronbach's alpha, which indicates how closely items are related within a group.²⁴ To check for similarity and internal consistency, we compared our results with those reported in Spector's original study.²⁵

Descriptive statistics were used to summarise respondent and MDA programme characteristics and CDD level of job satisfaction. Although the sample size was estimated without accounting for the clustered nature of the data, clustering was accounted for at the analysis stage, as proportions (and CIs) of satisfied participants for each satisfaction component, and overall satisfaction, were estimated assuming a stratified cluster sample (with LGAs as strata and health facilities as clusters). A bivariate logistic regression analysis was used to estimate the crude OR with 95% CI to determine the crude association between each covariate and respondent job satisfaction. Adjusted ORs (AORs) were estimated to determine the degree of association between dependent and explanatory variables with 95% CI at 5% significance level using multivariable logistic regression. The multivariable model was built based on expert knowledge and no variable selection was conducted. Because of potential differences between location type (rural vs urban) and between state (Kaduna vs Ogun) in terms of their sociodemographic and NTD programmatic features and maturity/support, a two-way interaction between type of area and state was checked. Two additional two-way interactions deemed important were checked (i.e. provision of transport fares during medicine distribution or training and urban/rural area). All interactions were assessed using the likelihood ratio test (LRT) at a 10% level of significance. Because of the clustered nature of the data, a mixed-effect logistic model accounting for health facility-level correlation and including the same variables as the fixed-effects only model, was also run. The mixed- and fixed-effects models were compared using the LRT at 5% significance level.

Results

Participants' characteristics

A total of 394 of 600 registered (65.7%) CDDs took part in this study. Table 1 shows that a total of 110 (47.6%) and 55 (33.7%) of the respondents were aged <30 y in Kaduna and Ogun, respectively. Of the respondents, 51.5% and 41.7% were male in Kaduna and Ogun, respectively, and more than one-half were from rural locations (54.1% and 54.6%, respectively). About one-half (52.0%) of the Kaduna respondents were reported to be in the middle-wealth quintile (Q3) and slightly less than one-half (47.2%) of the Ogun respondents were reported to be in Q4.

Table 1. Sociodemographic and work-related characteristics of community drug distributors (CDDs) in Kaduna and Ogun States, Nigeria

Characteristic	Kaduna State, N (%) (n=231)	Ogun State, N (%) (n=163)	All respondents, N (%) (n=394)
Age, n (%)			
<30 y	110 (47.6)	55 (33.7)	165 (41.9)
30–40 y	71 (30.7)	38 (23.3)	109 (27.7)
>40 y	50 (21.7)	70 (42.9)	120 (30.5)
Gender, n (%)			
Male	119 (51.5)	68 (41.7)	187 (47.5)
Female	112 (48.5)	95 (58.3)	207 (52.5)
Functional disability, n (%)			
No	227 (98.3)	160 (98.2)	387 (98.2)
Yes	4 (1.7)	3 (1.8)	7 (1.8)
Location type, n (%)			
Urban	106 (45.9)	74 (45.4)	180 (45.7)
Rural	125 (54.1)	89 (54.6)	214 (54.3)
N and % of total by state	231 (58.6)	163 (41.4)	394 (100.0)
Wealth quintile, n (%)			
Q1 (poorest)	19 (8.2)	3 (1.8)	22 (5.6)
Q2	67 (29.0)	17 (10.4)	84 (21.3)
Q3	120 (52.0)	49 (30.1)	169 (42.9)
Q4	25 (10.8)	77 (47.2)	102 (26.9)
Q5 (least poor)	0 (0.0)	17 (10.4)	17 (4.3)
Years of CDD experience, n (%)			
<3 y	114 (49.4)	93 (57.1)	207 (52.5)
3–5 y	71 (30.7)	36 (22.1)	107 (27.2)
>5 y	46 (19.9)	34 (20.9)	80 (20.3)
Community boundary ^a , n (%)			
No border	212 (91.8)	156 (95.7)	368 (93.4)
State border	19 (8.2)	7 (4.3)	26 (6.6)
CDDs active days in last MDA round, n (%)			
<8 d	94 (40.7)	60 (36.8)	154 (39.1)
8–15 d	103 (44.6)	94 (57.7)	197 (50.0)
>15 d	34 (14.7)	9 (5.5)	43 (10.9)
Who delivered MDA training—CDD ^b n (%)			
OIC	147 (67.1)	79 (55.6)	226 (62.6)
OIC-FLHF	48 (21.9)	29 (20.4)	77 (21.3)
OIC-LNTD-FLHF	21 (9.6)	29 (20.4)	50 (13.9)
OIC-LNTD-SNTD-FLHF	3 (1.4)	5 (3.5)	8 (2.2)
CDD received transport fare for MDA, n (%)			
Yes	59 (25.5)	72 (45.6)	131 (33.7)
No	172 (74.5)	86 (54.4)	258 (66.3)
CDD received transport fare for training, n (%)			
Yes	178 (77.1)	114 (72.6)	292 (75.3)
No	53 (22.9)	43 (27.4)	96 (24.7)

^aCommunity boundary refers to whether the community where CDDs perform their MDA activities shares a border with another state or another country, or not. Used as a proxy for remoteness of the CDD work location.

^bOIC, Officer-In-Charge of the health facilities; FLHF, frontline health facility staff; LNTD, local government NTD coordinator; SNTD, state NTD Coordinator.

Table 2. Proportion of community drug distributors (CDDs) classed as being satisfied overall and with specific components of their role (accounting for clustering), in Kaduna and Ogun State, Nigeria

Component	Kaduna (n=231)		Ogun (n=163)	
	Proportion satisfied (%)	95% CI	Proportion satisfied (%)	95% CI
Remuneration	6.7	3.9 to 11.1	10.0	7.0 to 14.0
Communication	10.1	6.2 to 16.0	16.5	12.8 to 20.9
Supplies/materials	35.9	30.0 to 42.3	37.4	31.2 to 44.0
Career progression	49.3	38.9 to 59.8	58.2	51.9 to 64.1
Workload	13.4	7.9 to 21.6	51.3	44.2 to 58.3
Work relationship	96.0	90.9 to 98.3	76.3	71.4 to 80.6
Motivation	98.9	95.8 to 99.8	98.6	96.2 to 99.5
Supervision	80.7	70.4 to 88.0	86.4	81.1 to 90.3
Training/guidance	67.4	59.7 to 74.2	77.2	71.5 to 82.0
Other	59.7	51.6 to 67.3	56.9	50.8 to 62.7
Overall satisfaction*	75.3	67.7 to 81.5	74.0	69.1 to 78.4

*Overall satisfaction indicated (in bold) is a composite of the 10 components of job satisfaction.

In both states, most respondents had <3 y of CDD experience (49.4% and 57.1%, respectively), and the most frequent number of active MDA days reported was in the 8 to 15 days category (44.6% and 57.7%, respectively). Most respondents did not receive transportation fares during MDA work (74.5% and 54.4%, respectively), but did receive them during training (77.1% and 72.6%, respectively).

Table 2 and Figure 1 display the proportion of CDDs who were categorised as being satisfied overall; 75.3% (95% CI 67.7 to 81.5%) and 74% (95% CI 69.1 to 78.4%) in Kaduna and Ogun, respectively. In terms of individual components, the highest satisfaction in both states was with motivation, where 98.9% (95% CI 95.8 to 99.8%) and 98.6% (95% CI 96.2 to 99.5%) of CDDs were categorised as satisfied, respectively. The lowest satisfaction component (in both states) was remuneration, where only 6.7% (95% CI 3.9 to 11.1%) and 10.0% (95% CI 7.0 to 14.0%) of CDDs were satisfied, respectively. There were large between-state differences in satisfaction for workload (13.4% [95% CI 7.9 to 21.6%] of respondents in Kaduna were satisfied compared with 51.3% [95% CI 44.2 to 58.3%] in Ogun) and work relationships (96.0% [95% CI 90.9 to 98.3%] vs 76.3% [95% CI 71.4 to 80.6%]), respectively.

Level of job satisfaction among CDDs

The total Cronbach's alpha for our 51-item scale was 0.79, which approximates the 0.8 threshold for a very good level of agreement (Table 3). This indicates that the degree of internal consistency is adequate and thus tends towards the internal consistency coefficient reported in Spector's original study.²⁵

Pearson's correlation matrix (Table 4) indicates that training and guidelines ($r=0.63$), motivation ($r=0.61$), working relationships ($r=0.57$) and supervision ($r=0.53$) were all substantially correlated with overall satisfaction, while communication ($r=0.45$), supplies and materials ($r=0.37$) and remuneration ($r=0.35$) were moderately correlated.

Factors influencing overall job satisfaction

The LRT testing of the significance of the intraclass correlation in the mixed-effects model indicated that health facility clustering was low and there was no need for a mixed-effects model (LRT $p=0.364$). Therefore, the presented results are those obtained with the fixed-effects multivariable model. The model showed that years of experience, location type and state, who delivered the CDD/MDA training and receipt of transport fares during MDA were significantly associated with job satisfaction (Table 5).

The odds of satisfaction among CDDs with >5 y of experience were significantly less compared with those with <3 y of experience (AOR=0.33; 95% CI 0.15 to 0.76). The odds of satisfaction were two times higher among CDDs trained by a team made up of an officer-in-charge (OIC) and frontline health facility staff (FLHF) (AOR=2.18; 95% CI 1.01 to 4.69) and approximately four times higher among those trained by a team made up of an OIC+FLHF and local government NTD coordinator (LNTD) (AOR=3.82; 95% CI 1.51 to 9.67) compared with those trained by an OIC only. CDDs who received transport fares during medicine distribution (MDA) had three times higher odds of satisfaction compared with those who did not (AOR=2.93; 95% CI 1.53 to 5.64); however, no significant difference was found for CDDs who received transport fares during training (AOR=0.94; 95% CI 0.45 to 1.96) compared to those who did not. The LRT indicated that the model with interaction term between location type (urban vs rural) and state (Ogun vs Kaduna) was significant and was therefore retained in the model (Table 5).

In Ogun state, CDDs living in rural areas had significantly lower odds of job satisfaction than those living in urban areas (AOR=0.18; 95% CI 0.06 to 0.50). Although not statistically significant, there was a reverse trend in Kaduna, where CDDs living in rural areas tended to be more satisfied than those living in urban areas. Comparing the two states for rural areas only, we see that CDDs living in Kaduna had statistically significant, six times higher odds of reporting satisfaction than those living in Ogun (AOR=6.31; 95% CI 2.57 to 5.51). However, no difference was

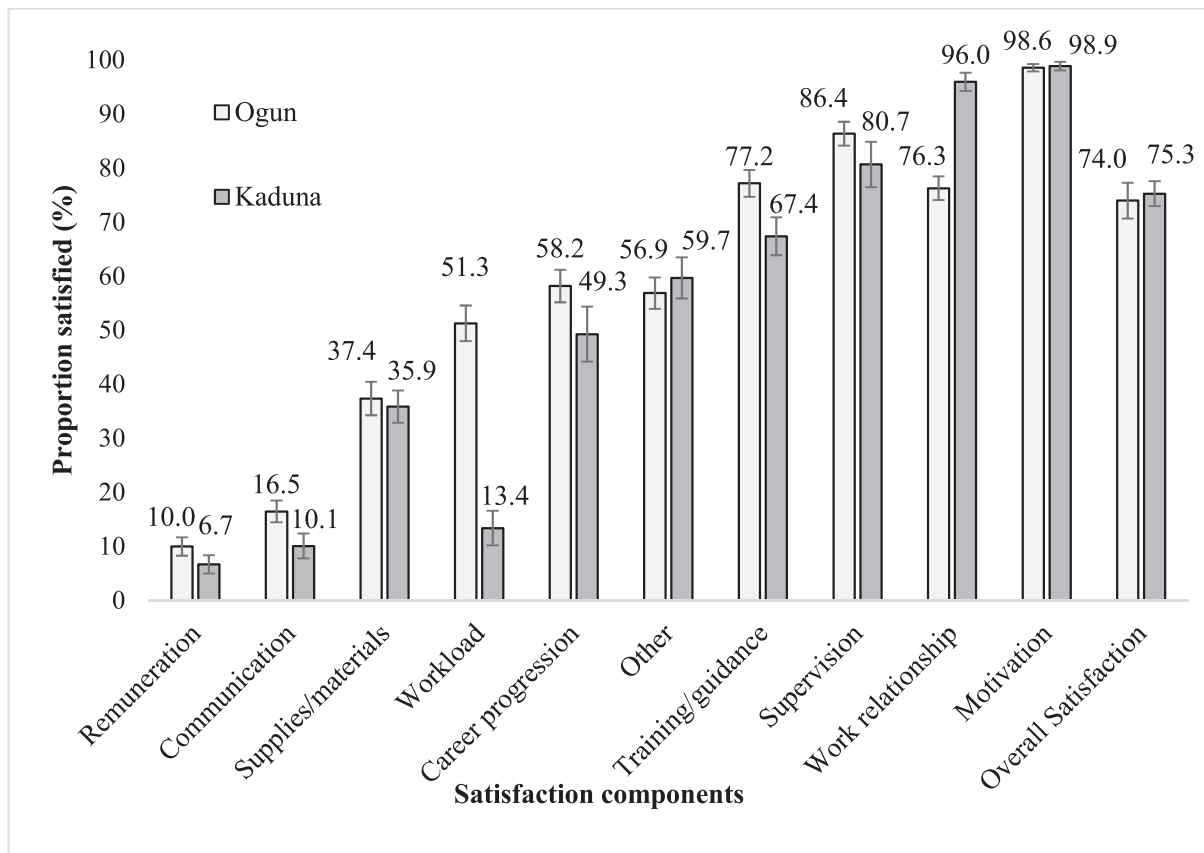


Figure 1. Proportion of CDDs satisfied overall and for each of the 10 components of job satisfaction. See Supplementary Data 2 for the items included in each satisfaction component.

Table 3. Measurement of internal consistency of our components compared with the reliability of estimates of Spector’s Job Satisfaction scales²⁰

Component	Study scale						Spector scale		
	Kaduna		Ogun		Overall		Component	Obs.	alpha
	Obs.	alpha	Obs.	alpha	Obs.	alpha			
Remuneration	231	0.65	163	0.74	394	0.65	Pay	2870	0.75
Career progression	231	0.67	163	0.74	394	0.66	Promotion	2870	0.73
Supervision	231	0.62	163	0.71	394	0.60	Supervision	2870	0.82
Training and guidelines	231	0.58	163	0.69	394	0.57	Operating condition	2870	0.62
Working relationship	231	0.62	163	0.66	394	0.59	Coworkers	2870	0.60
Motivation	231	0.62	163	0.70	394	0.60	Contingent rewards	2870	0.76
Communication	231	0.64	163	0.69	394	0.61	Communication	2870	0.60
Workload/reporting	231	0.66	163	0.71	394	0.65	Nature of work	2870	0.78
Supplies and materials	231	0.63	163	0.71	394	0.60	Fringe benefits	2870	0.73
Other	231	0.63	163	0.70	394	0.61	-	-	-
Overall JSS (1–51 items)	231	0.80	163	0.82	394	0.79	Overall JSS (1–36 items)	2870	0.91

Note: The two scales are matched as closely as possible based on components. In some instances, however, this is not a perfect match and for the ‘other’ components, no match was possible. JSS, job satisfaction score.

Table 4. Correlation between overall satisfaction and components of job satisfaction among community drug distributors (CDDs) in Kaduna and Ogun States, Nigeria

Component	Mean	SD	Overall satisfaction	Remuneration	Career progression	Supervision	Training and guidelines	Working relationship	Motivation	Communication	Workload/Reporting	Supplies and materials	Other
Overall satisfaction	2.78	0.58	1										
Remuneration	3.59	0.83	0.35*	1									
Career progression	4.14	0.59	0.11	-0.01	1								
Supervision	3.79	0.62	0.53*	0.003	0.03	1							
Training and guidelines	4.20	0.56	0.63*	0.05	-0.12	0.37	1						
Working relationship	4.36	0.39	0.57*	-0.13	0.01	0.37	0.51*	1					
Motivation	2.89	0.71	0.61*	-0.04	0.01	0.35	0.24*	0.10	1				
Communication	3.01	0.98	0.45*	0.11	-0.03	0.08	0.25*	-0.13	0.17*	1			
Workload/reporting	3.29	0.77	0.19*	-0.08	0.08	-0.00	0.14*	-0.11	0.11	0.12	1		
Supplies and materials	3.53	0.75	0.37*	0.05	-0.07	0.04	0.19*	0.15*	0.06*	0.11	0.21*	1	
Other	3.69	0.27	0.40*	0.13*	0.05	-0.08	0.15*	0.13*	0.02*	0.13*	0.21*	0.40	1

*Correlation is significant at the 0.01 level. Pearson's correlation was performed to measure the correlation between overall job satisfaction and each component of job satisfaction. The correlation between the different components was found to be significant. This implies that satisfaction was associated with individual job aspects. Any correlation coefficient between 0.5 and 0.69 is treated as substantial correlation (indicated in bold and underlined), 0.30–0.49 moderate correlation and 0.10 to 0.29 low correlation.

found in job satisfaction levels between the states for CDDs living in urban areas. Participants' overall job satisfaction did not appear to be associated with their sociodemographic characteristics, as age, gender, functional disability and wealth quintile were not found to be associated with job satisfaction (Table 5).

Discussion

CDD job satisfaction plays a vital role in NTD programme implementation and impact. However, to the best of our knowledge, no other study has specifically explored CDD job satisfaction in the NTD programme context. Hence, we discuss our results alongside studies on other types of CHW and health extension worker (a similar role in Ethiopia) job satisfaction, as well as those that explore the motivating factors of CDDs in NTD programmes with different methods.^{26–28}

Although comparison of overall satisfaction between contexts is challenging because of methodological and contextual differences, our findings on overall job satisfaction (75.3% and 74.0% CDDs satisfied in Kaduna and Ogun, respectively) are in line with those reporting Iranian CHW satisfaction (70.3% satisfied, n=74),²⁹ and substantially higher than the Ethiopian rural health extension worker satisfaction of 45.8% (n=260) reported for the Oromia region²⁸ and 36.6% (n=339) for the Sidama region.¹² Those levels are also somewhat in line with findings in Imo state, Nigeria, where about one-third of CDDs reported not being willing to undertake their role anymore.⁶

In our study, only 6.7% and 10.0% of CDDs were satisfied with the remuneration in Kaduna and Ogun, respectively. Remuneration was moderately correlated with overall satisfaction, and receipt of transport fares for MDA (but not during training) was significantly associated with overall satisfaction in both states. Dissatisfaction with remuneration, pay, incentives or compensation has been a dominant finding in other studies; for example, only 9.0% and 14.0% of CHWs in Sierra Leone and Malaysia, respectively, were satisfied with payment and benefits.^{30,31} In a Ugandan study, only 17–20% of CDDs received financial incentives from communities, 30–45% received in-kind contributions and 40–45% would have welcomed additional motivation, however all reported being willing to work because they had been entrusted with the responsibility by their community. This suggests that community trust as well as financial and in-kind contributions are complementary motivating factors.³² Although we asked about community (i.e. in-kind) compensation, this item was subsumed into a remuneration component (where satisfaction was low) and was therefore not analysed individually in our study. Furthermore, asking community members to provide in-kind contributions may raise equity concerns.⁵ Different levels of compensation between health/disease programmes can affect satisfaction and ongoing participation; for example, a study in Nigeria reported that 5% of onchocerciasis programme volunteers ceased working for the programme (p<0.001), but continued to volunteer on other health programmes that provided them with monetary incentives.⁶ This implies that NTD programmes need to consider the wider context when planning CDD remuneration.

Satisfaction with communication (e.g. the ways decisions are made in the NTD programme, input to decisions made,

Table 5. Factors associated with job satisfaction among CDDs in Kaduna and Ogun States, Nigeria, 2019: results from the multivariate model

Variable	Satisfied	Dissatisfied	COR (95% CI)	p	AOR (95% CI)	p
CDD sociodemographic characteristics						
Age						
<30 y	119 (72.1)	46 (27.9)	Reference	-	Reference	-
30–40 y	82 (75.2)	27 (24.8)	1.17 (0.68 to 2.04)	0.57	1.09 (0.56 to 2.12)	0.81
>40 y	96 (80.0)	24 (20.0)	1.55 (0.88 to 2.71)	0.13	1.77 (0.81 to 3.83)	0.15
Gender						
Male	144 (77.0)	43 (23.0)	Reference	-	Reference	-
Female	153 (73.9)	54 (26.1)	0.85 (0.53 to 1.34)	0.48	0.90 (0.46 to 1.74)	0.46
Functional disability						
No	293 (75.7)	94 (24.3)	Reference	-	Reference	-
Yes	4 (57.1)	3 (42.9)	0.43 (0.09 to 1.95)	0.27	0.42 (0.10 to 1.76)	0.23
Wealth quintile						
Q1 (poorest)	14 (63.6)	8 (36.4)	Reference	-	Reference	-
Q2	60 (71.4)	24 (28.6)	1.43 (0.53 to 3.84)	0.48	1.43 (0.47 to 4.36)	0.53
Q3	133 (78.7)	36 (21.3)	2.11 (0.82 to 5.42)	0.12	2.15 (0.75 to 6.20)	1.16
Q4	79 (77.5)	23 (22.6)	1.96 (0.73 to 5.42)	0.18	2.87 (0.89 to 9.22)	0.08
Q5 (least poor)	11 (64.7)	6 (35.3)	1.05 (0.28 to 3.92)	0.95	1.93 (0.38 to 9.79)	0.43
CDD MDA work situation						
Years of experience						
<3 y	159 (76.8)	48 (23.2)	Reference	-	Reference	-
3–5 y	81 (75.5)	26 (24.3)	0.94 (0.54 to 1.62)	0.83	0.64 (0.32 to 1.28)	0.21
>5 y	57 (71.3)	23 (28.8)	0.75 (0.42 to 1.34)	0.33	0.33 (0.15 to 0.76)	0.01
Community boundary						
No border	280 (76.1)	88 (23.9)	Reference	-	Reference	-
State border	17 (65.4)	9 (34.6)	0.59 (0.26 to 1.38)	0.23	0.45 (0.17 to 1.19)	0.11
Location type, in Ogun state ^a						
Urban	61 (82.4)	13 (17.6)	Reference	-	Reference	-
Rural	59 (66.9)	30 (33.7)	0.42 (0.20 to 0.88)	0.02	0.18 (0.06 to 0.50)	0.001
Location type, in Kaduna state ^a						
Urban	78 (73.6)	28 (26.4)	Reference	-	Reference	-
Rural	99 (79.2)	26 (20.8)	1.37 (0.74 to 2.52)	0.32	2.03 (0.86 to 4.82)	0.11
State, in urban areas ^a						
Ogun	61 (82.4)	13 (17.6)	Reference	-	Reference	-
Kaduna	78 (73.6)	28 (26.4)	0.59 (0.28 to 1.24)	0.17	0.55 (0.19 to 1.59)	0.27
State, in rural areas ^a						
Ogun	59 (66.3)	30 (33.7)	Reference	-	Reference	-
Kaduna	99 (79.2)	26 (20.8)	1.93 (1.05 to 3.59)	0.04	6.31 (2.57 to 5.51)	<0.001
Active days in MDA						
<8 d	110 (71.4)	44 (28.6)	Reference	-	Reference	-
8–15 d	153 (77.7)	44 (22.3)	1.39 (0.86 to 2.26)	0.18	1.27 (0.72 to 2.29)	0.41
>16 d	34 (79.1)	9 (20.9)	1.51 (0.67 to 3.41)	0.32	0.99 (0.38 to 2.57)	0.98
Provision for MDA						
Health staff delivering training ^b						
OIC	164 (72.6)	62 (27.4)	Reference	-	Reference	-
OIC-FLHF	63 (81.8)	14 (18.2)	1.70 (0.89 to 3.25)	0.11	2.18 (1.01 to 4.69)	0.05
OIC-LNTD-FLHF	42 (84.0)	8 (16.0)	1.98 (0.88 to 4.46)	0.10	3.82 (1.51 to 9.67)	0.01
OIC-LNTD-SNTD-FLHF	5 (62.5)	3 (37.5)	0.63 (0.15 to 2.72)	0.52	1.37 (0.27 to 6.86)	0.70

Table 5. Continued

Variable	Satisfied	Dissatisfied	COR (95% CI)	p	AOR (95% CI)	p
Received transport fares for MDA						
No	186 (72.1)	72 (27.9)	Reference	-	Reference	-
Yes	107(81.7)	24 (18.3)	1.73 (1.03 to 2.90)	0.04	2.93 (1.53 to 5.64)	0.001
Received transport fares for training						
No	219 (75)	73 (25)	Reference	-	Reference	-
Yes	73 (76.0)	23 (24)	1.06 (0.62 to 1.81)	0.84	0.94 (0.45 to 1.96)	0.86

Abbreviations: AOR, adjusted OR; CDD, community drug distributor; COR, crude OR; FLHF, frontline health facility staff; LNTD, local Government NTD coordinator; OIC, Officer-in-Charge; SNTD, state NTD coordinator.

OR values significant at 5% level are indicated in bold.

^a Effects for the interaction between state and location type.

^b This indicates the category of NTD team who provide training to CDDs as they prepare for MDA. Training refers to the process by which frontline implementers who are engaged in the NTD programme are trained on how to implement MDA. In Nigeria, training usually follows a cascade structure, where the state NTD team trained local government area NTD coordinators, who in turn trained FLHF staff, who then trained and supervised CDDs.

awareness of when changes happened) was low in Kaduna (10.1%), as well as in Ogun (16.5%) in absolute terms, and relative to satisfaction with other aspects, and was correlated with overall satisfaction. Other studies indicate that participation in decision-making is associated with job satisfaction²⁸ and that it is possible to achieve high levels of CHW satisfaction with communication (e.g. in Vietnam, CHWs indicated high [74.0%] satisfaction with communication¹¹), supporting our recommendation that efforts to improve communication between the programme and CDDs should be prioritised in Nigeria's NTD programme.

Our study revealed that about one-half of CDDs were satisfied with workload in Ogun (51.3%), with only 13.4% satisfied in Kaduna. Other studies reporting challenges faced by CDDs have noted that increasing complexity, changing circumstances regarding medicine delivery (e.g. the introduction of different reporting formats and deadlines) and more sceptical and drug-fatigued communities tended to increase CDD workloads, and negatively affected their performance and motivation.^{3,26}

Overall satisfaction was found to be strongly correlated with training and guidelines, and training delivered by local health or programme staff was significantly associated with increased overall job satisfaction in our model. More than one-half of CDDs in Kaduna (67.4%) and Ogun (77.2%) were satisfied with the training and guidance to understand and perform their roles as CDDs. Other studies have shown high CHW satisfaction with training and highlighted the importance of adequate CDD training (i.e. of appropriate duration, conducted by health personnel and with quality content, as recommended by the WHO).^{26,32} We therefore recommend that greater attention should be paid to ensure the quality and relevance of CDD training and guidance to help them understand and deliver in their roles, as well as to upgrade their knowledge and skills.

In this study, satisfaction with working relationships (96.0% in Kaduna and 76.3% in Ogun) was substantially correlated with overall satisfaction, and at similar levels to those found in a study of Nigerian CHWs and Community Health Officers, where 68.9%

and 84.4% were satisfied with their working relationships, respectively.³³ Similarly, motivation is linked to satisfaction in the current study and other research²⁸ and was high in our study (98.9% and 98.6% of CDDs reported high satisfaction).³⁴ These results suggest that even where satisfaction with remuneration and other aspects is low, positive working relationships (with other CDDs, health facility staff, NTD programme staff and the community) and personal motivation can still result in job satisfaction for CDDs.

Findings from the multivariable model showed that having >5 y of MDA experience has a negative significant effect on overall job satisfaction, suggesting that satisfaction erodes over time. Other research has reported both similar (e.g. healthcare worker satisfaction in Saudi Arabia was inversely related to the number of years of experience³⁵) and opposing results (e.g. in Lao PDR, satisfaction increased with increasing years of experience³⁶).

The interaction between location type (urban/rural) and state suggests that CDD satisfaction was similar in the urban areas of the two states, but much lower in the rural areas of Ogun. This finding indicates that the impact of lower programme support and integration in Ogun may be exacerbated in rural areas, where CDDs potentially face additional challenges. Although other findings vary in this regard, this suggests that it would be useful for future studies to account for differences across rural and urban locations.

This study has several limitations. First, the sample size was relatively small because of our limited resources and did not account for the clustered nature of the data, but CIs for the proportion estimates for overall satisfaction and all satisfaction components did account for clustering, assuming a stratified cluster sample. All proportion estimates had margins of error that did not exceed 10.5% (which was for the career progression component in Kaduna), which seems reasonable. Second, our study is limited to only two states, which may not be representative of the entire NTD community of volunteers in Nigeria, particularly as satisfaction levels varied across area types (rural vs urban) in the two states. This means that generalisation of our results to

other states might be limited; however, given that our chosen states represent two extremes in terms of NTD programme support, findings that were consistent between our two states (i.e. on which staff delivered training and receipt of transport fares) are potentially generalisable, although this could only be ascertained in a larger study including more states. While our findings may indicate areas of focus for improving CDD satisfaction, the cross-sectional design of the study allowed assessing correlation and not causation, which may mean that changes to certain aspects of CDD support may not result in changes to job satisfaction.

Conclusions

We recommend that CDD training should be delivered in a cascade, including a range of cadres such as OICs, FLHF staff and local government NTD coordinators, and that consideration be given to providing transport fares consistently for all CDDs during MDA. Improving communication between the NTD programme and CDD volunteers and ensuring adequate supplies and materials may also improve CDD job satisfaction. Attention should be given to protecting and enhancing components such as training and guidance where satisfaction is already high and likely motivating for CDDs. While our results are highly context specific, the methods are broadly applicable to investigate CDD job satisfaction. However, we recommend that future studies be conducted in states with different levels of programmatic support, and with methods placing greater emphasis on investigating drivers of satisfaction for rural and urban areas separately, and in relation to programme support. This will support identification of context-specific issues as well as elucidation of recommendations that are more generalisable across the entire continuum of programme support.

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Ethical approval: The study obtained ethical clearance from the National Health Research Ethics committee of Nigeria (NHREC/01/01/2007–19/11/2019B), the State health Research Ethics Committee in Ogun (HPRS/381/284) and the Liverpool School of Tropical Medicine Research Ethics Committee review board (LSTM REF 18-029). Participants were informed about the purpose of the study, benefits, risk, confidentiality of their information and the voluntary nature of participation. Data collection only took place after written informed consent was provided by individual respondents before they could participate in the survey. All personal data were anonymised by assigning ID numbers to study participants and these were used throughout data entry and during analysis.

Data availability: The dataset generated is available from the corresponding author on reasonable request.

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