Willingness to work as frontline Health care providers during COVID-19 pandemic in Nigeria

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Abstract

***Background**: Health care workers are at the forefront of COVID-19 outbreak responses. As the pressure on the global health care workforce intensifies, there is a need to mobilize relevant health care workers to the frontline of prevention and control activities. This study assessed the willingness of health care workers to participate as frontline care providers during COVID-19 prevention and control in South-western Nigeria.*

***Methods**: A descriptive, cross-sectional study was conducted among 709 healthcare providers serially recruited through an online survey. Research instrument was a semi structured pretested, self-administered questionnaire. Data was analyzed using the SPSS software version 24.0.*

***Results**: Fifty-four percent opined that Nigeria presently lacks human resource capacity to manage the ongoing pandemic. While 64.9% were willing to work as frontline health care provider in COVID-19 control, about 81.5% of the respondents would work on some conditions, and 76.0% would work voluntarily. About 19.7% stated that they were not at risk of contracting COVID-19. Barriers to volunteering included "lack of confidence in Government/employer caring for the health worker if infected" (97%). Significant predictors of willingness to work as front line health care workers include*

being a male (OR 3.8), spending less than 10 years in practice (OR 2.75), availability of PPEs (OR 3.57); payment of special allowance (OR 1.56); increment of hazard allowance (OR 2.29); and prior training on IPC (OR 2.85).

***Conclusion**: Governments and other stakeholders need to remove listed barriers and encourage motivators to work as frontline health care workers to facilitate COVID-19 control in Nigeria.*

***Keywords:** COVID-19, Health care workers, Volunteer, Prevention and control, Willingness to work*

Introduction

COVID-19 caused by SARS-CoV-2 infection, is the third widely known zoonotic coronavirus disease after SARS and Middle East Respiratory Syndrome (MERS).[1] SARS-CoV-2, just like MERS-CoV is a coronavirus and belongs to the β-coronavirus cluster.[1,2] Many researchers have identified the SARS-CoV-2 as the causative agent of COVID-19.[3-5] SARS-CoV-2 is an RNA and enveloped virus that is capable of causing serious respiratory, neurologic and hepatic disorders.[6] The emergence of the novel coronavirus disease was first documented in Wuhan-China.[7] Although cases of the COVID-19 can be dated back to December 29, 2019[8], the first confirmed laboratory index case was formally documented in the country by the World Health Organization (WHO) in January 21, 2020.[9]

Emerging high-threat pathogens including SARS-CoV-2, have infected health-care workers (HCWs).[10,11] in China and several other countries; with intensified pressure on the global health care workforce.[10,11] This pressure takes 2 forms: the first is the potentially overwhelming burden of illnesses that stresses health system capacity, and the second is the adverse effects on health care workers, including the risk of infection.[12]

Health workers are at the front line of any outbreak response and as such are exposed to hazards that put them at risk of infection with the outbreak pathogen particularly.[13] These hazards include but are not limited to pathogen exposure, long working hours, psychological distress, fatigue, occupational burnout, stigma, and physical and psychological violence.[13] As part of their chosen profession, HCWs often accept increased risk of infection, however, they often exhibit concern about family transmission, especially involving family members who are elderly, immune-compromised, or have chronic medical conditions.[12]

The efforts of HCWs at the frontline of any outbreak including COVID-19 at containing and curtailing the community transmissions of the outbreak in many states of Nigeria are overwhelming. Their activities in the management and control of the pandemic include: laboratory testing of suspected people, contact tracing, management of isolated patients and several advocacy programs. In Nigeria, as at August 2020, frontline health workers are dealing with a huge influx of

patients, while also facing challenges of limited diagnostic kits, inadequate respiratory equipment in many cases and the fear of contracting the infection.

The target population in this study comprises Medical Doctors, Nurses and Medical Laboratory professionals. Physicians are the first health workers to be contacted by the patients. They are responsible for review of the patients from first day of patients 'visit to health institutions till they are discharged. Nurses are important health worker that serve as a vital link between the patients and the rest of the health care team. They assist in quick response of the patients to treatment and management through providing listening ears or a calming touch. Medical Laboratory professionals are the backbone of medical laboratories ensuring appropriate and accurate diagnosis of suspected people based on the request of the physicians. They also assist in proper monitoring and management of the patients by providing quality laboratory findings.

As at beginning of June 2020, the virus has infected more than 6 million people and claimed over 370,000 lives globally while over 10,000 confirmed cases and 287 deaths have been reported in Nigeria where the index case was reported on February 27, 2020.[14] Sequel to the outbreak, the reports of the fatalities emanating from the pandemic in many countries of the world including Nigeria have been of grave concern. The aim of this study is to investigate the willingness of health workers to voluntarily take part in COVID-19 control in Nigeria considering the overstressed condition of the present frontline health care workers.

Materials and Methods

Study population

A descriptive, cross-sectional study was conducted among healthcare providers in Nigeria, from April 2020 to May 2020. A simple random sampling strategy was adopted and respondents aged 18 years and above, comprising male and female health workers living within the country were selected. The Healthcare providers include Doctors, Nurses and Medical Laboratory Scientists.

Sample Size Determination

Considering the fact that the total population of health workers in Nigeria is greater than 10,000 and taking the rate of willingness of health workers to voluntarily take part in COVID-19 control in Nigeria to be 50% since there was no official report on the rate in the country, the sample size was calculated at 95% Confidence level and degree of inaccuracy of 5% using the formula: $N = Z^2 P (1-P)^2 / d^2$ [15]. The minimum sample size derived was 360.

Data collection

The data was collected through an online self-administered questionnaire which was designed by the research group. The drafted questionnaire was sent to three Public Health Epidemiologists at University of Medical Sciences, Ondo for their opinions on its simplicity and the ability to assess the objective of the study. The corrected questionnaire was pretested by administration to fifty (50) selected respondents that did not participate in the actual study. Based on results from the pretest, the final questionnaire was drafted by the authors. The structured questionnaire was divided into four sections namely: Demography of respondents, knowledge on Nigerian health worker capacity to manage the COVID-19 pandemic, willingness of health workers to voluntarily take part in the control of the outbreak and the way forward on containing and curtailing the pandemic. The tool was construed in simple English Language and shared using online medium like telegram, email addresses and WhatsApp. Respondents' participation was voluntary, consensual, and anonymous. It was administered from April to May 2020.

Data analysis

Data obtained were analyzed with SPSS version 24 software (SPSS Inc. Chicago, USA). Descriptive analysis was reported as frequency, percentage and mean. Respondents' willingness to work as frontline Health care providers during COVID-19 pandemic in relation to age, gender and marital status were analyzed using descriptive and analytic statistics. Frequency of participants towards various motivations that can attract voluntary participation in the control of the pandemic were also analyzed and presented in tables, graphs and charts. P-value of ≤ 0.05 was taken as statistical significance level.

Ethical approval

All the eligible respondents were properly informed about the aim and objectives of the study, they consented to the study and their participation was voluntary and anonymous. The study was approved by the Ethics Committee of University of Medical Sciences, Ondo.

Results

Seven hundred and nine (709) respondents fully completed the questionnaire. Most respondents are in the 30-39 years age range, with the mean age being 37.8+/-8.7 years. There were more females than males, while the majority of the respondents were nurses (55.9%). Most of the respondents were married (78%). More of the respondents had spent less than 10 years in medical practice (43.3%), with the mean year of practice being 12.4+/-8.4 years as shown in table 1. Almost all the respondents are full time staff 652 (92%), while 55.3 of the respondents work in the tertiary

health facilities. Also, 75.5% of the respondents work in urban area, where most of them also live (80%) as shown in table 1.

Table 1: Socio-demographic Characteristics of Respondents

Variable	Frequency N = 709	Percentage (%)
Age (in years)		
20 – 29	120	16.9
30 – 39	319	45.0
40 – 49	182	25.7
≥ 50	88	12.4
Mean age ± SD	*37.8 ± 8.7*	
Range	*20 – 64*	
Sex		
Male	288	40.6
Female	421	59.4
Designation		
Doctor	128	18.1
Medical Lab. Worker	185	26.0
Nurse	396	55.9
Marital Status		
Ever married	553	78.0
Never married	156	22.0
Years of Medical Practice		
0 – 9	308	43.4
10 – 19	249	35.1
20 – 29	110	15.5
30 and above	42	5.9
Mean Years of Practice ± SD	*12.4 ±8.4*	
Range	*0 – 44*	
Present Place of Work		
Tertiary Health Facility	392	55.3
Secondary Health Facility	189	26.7
Private Health Facility	98	13.8
Others	30	4.2
Nature of Work		
Full time	652	92.0
Part time	57	8.0
Location of current place of practice		
Periurban	74	10.4
Rural	100	14.1
Urban	535	75.5

Your residential area		
Periurban	60	8.5
Rural	77	10.9
Urban	572	80.7

As shown in table 2, 54% of the respondents are of the opinion that Nigeria presently does not have the full capacity to manage the ongoing COVID-19 pandemic in terms of human resources; while 81.4% opined that Nigeria presently does not have the full capacity to manage the ongoing COVID-19 pandemic in terms of material resources or equipment. Slightly above half (50.4%) of the respondents do not agree that the various lockdown and restrictions could further deplete availability of health resources to manage COVID-19 pandemic.

Table 2: Willingness to work as frontline health care provider in Covid-19 Management

Variable	Frequency N = 709	Percentage (%)
Nigeria presently have the full capacity to manage the ongoing COVID-19 pandemic in terms of human resources		
Yes	243	34.3
No	383	54.0
Not sure	83	11.7
Nigeria presently has the full capacity to manage the ongoing COVID-19 pandemic in terms of material resources/equipment		
Yes	41	5.8
No	577	81.4
Not sure	91	12.8
The various lockdown and restrictions could further deplete availability of health resources to manage COVID-19 pandemic		
Yes	232	32.7
No	357	50.4
Not sure	120	16.9
Frontline health workforce in COVID control are important, as they are directly involved in patient care and support, be it on the field, in isolation centers, in surveillance work, in emergency or casualty care etc		
Yes	686	96.8
No	7	1.0
Undecided	16	2.3

You consider yourself as presently or currently a Frontline health care worker directly or fully involved in contacts and management of COVID-19 cases		
Yes	446	62.9
No	263	37.1
In case there is a need for extra hands to join frontline health workforce in COVID control (on the field, in isolation centers, in surveillance work, in emergency or casualty care etc), you will be willing to work as frontline health care provider		
Yes	460	64.9
No	153	21.6
Not sure	96	13.5

Concerning the importance of frontline health workforce in COVID control, almost all the respondents (96.8%) said that they are important, while little less than two-third (62.9%) consider themselves as presently or currently a frontline health care worker directly or fully involved in contacts and management of COVID-19 cases. In terms of willingness to work as frontline health care provider in case there is a need for extra hands to join frontline health workforce in COVID control (on the field, in isolation centers, in surveillance work, in emergency or casualty care etc.), also less than two-third (64.9%) of the respondents are willing, while 21.6% are not willing.

As shown in table 3, 81.5% of the respondents stated that their willingness to work as frontline health care provider in case there is a need for extra hands to join frontline health workforce in COVID control will be on some conditions, even though majority (76%) also stated that their willingness to work as frontline health care provider is voluntary and from their mind. Only 16.2% of the respondents will volunteer only if forced by Government or the law. Also 489 (69%) of the respondents will not consider resignation if they were forced by the Government to work as frontline health worker. Also 384 respondents (54.2%) stated that they can only work as frontline health worker on a temporary basis.

Table 3: Conditions for willingness and Self risk perception to COVID-19

Variable	Frequency N = 709	Percentage (%)
My willingness will be on some conditions		
Yes	578	81.5
No	131	18.5
My willingness to participate is voluntary and down from my mind		

Yes	539	76.0
No	170	24.0
I will volunteer only if forced by Government or the law		
Yes	115	16.2
No	594	83.8
I can only work as frontline health worker on a temporary basis		
Yes	384	54.2
No	325	45.8
I just cannot contact COVID-19, I am immune to it		
Yes	75	10.6
No	634	89.4
I am not at risk of contracting COVID-19		
Yes	140	19.7
No	569	80.3
If I am not willing and Government forced me, I will consider resignation		
Yes	220	31.0
No	489	69.0
Reasons why I will be willing to work as frontline care provider*		
It is a call to duty as health care worker	546	77.0
It is my duty to help	403	57.7
It is my professional obligation/ethics	499	70.4
I have been trained on infection prevention and control	322	45.4
I have self-confidence, the skills and communication	277	39.1

**Multiple responses*

On the issue of perceived susceptibility to contacting COVID-19, only 10.6% of the respondents stated that they cannot contact COVID-19, as they were immune to it, while 140 (19.7%) stated that they were not at risk of contracting COVID-19. The mostly cited reason for willingness to work as frontline care provider was because it is a call to duty as health care worker (77%), and also because it was a professional obligation (70.4%).

In terms of barriers and motivators to volunteer as frontline health care workers as shown in table 4, the mostly cited barrier was "I don't have confidence in Government or my employer caring for me if infected" (97%), and inability to work if personally ill (74.2%). This was distally followed by consideration of safety of the family (36.4%). All the listed motivators were cited as important for

volunteering as frontline health care worker. The most cited was availability of PPEs (93.4%), and appropriate training (88%), closely followed by assurance of life insurance (82.9%), and special allowance being attached (81.9%).

Table 4: Barriers and motivators to volunteer as frontline health care workers

Variable (Yes only option)	Frequency N = 709	Percentage (%)
Barriers*		
Need to cater for my children	218	30.7
If the infecting strain in Nigeria is very virulence	159	22.4
If I am pregnant or my wife is pregnant	198	27.9
I don't have confidence in Government or my employer caring for me if infected	688	97.0
High workload already	185	26.1
I could be stigmatized against if infected	163	23.0
Safety of my family	258	36.4
High family's concern for my safety	241	34.0
If I am ill myself	526	74.2
Transport difficulties	116	16.4
Motivators*		
If PPEs are available	662	93.4
If I will be trained	624	88.0
If I am assured of life insurance	588	82.9
If special allowance is attached	581	81.9
If hazard allowance would be increased	578	81.5
If potent vaccines are available	574	81.0
When epidemiologic curve is already flattened; If adequate information about the risk is available	545	76.9
If adequate information about risk is available	542	76.4

**Multiple responses*

Figure 1 shows that 80.7% of respondents believed that they are at risk of contracting COVID-19. About 64.9% were willing to work as frontline HCW during the pandemic.

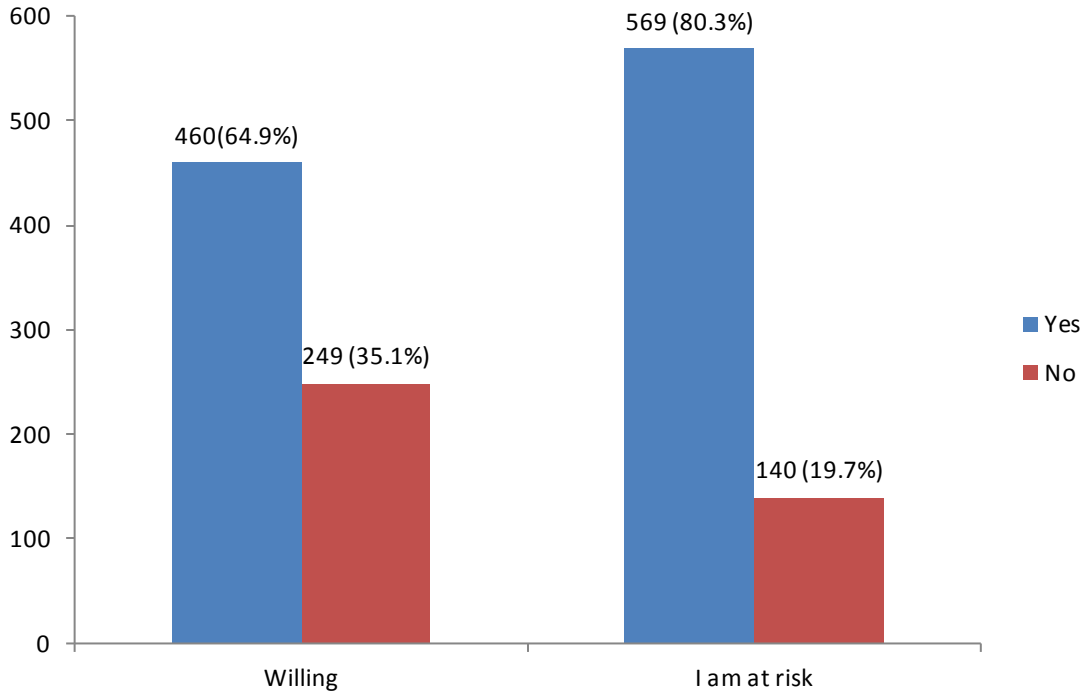

Figure 1: Willingness to work as frontline HCW and self-risk perception to COVID-19

Table 5 shows that a statistically significant association occurs between willingness to work as frontline HCWs during COVID-19 pandemic and gender (p - 0.001), number of years in practice (p - 0.023), place of work (p - 0.012), if PPEs area available (p - 0.001), If special allowance is attached (p - 0.024), If hazard allowance would be increased (p - 0.001) and if respondent is trained on infection prevention and control (p – 0.001)

Table 5: Predictors of willingness to work or volunteer as frontline health care workers during COVID-19 pandemic

Variable		Bivariate analysis			Binary logistic regression			
		Willingness to volunteer		X^2, *p* value	OR	95%CI		*P* value
		Yes	No			Lower	Upper	
Age in years	20-39	284(64.7)	155(35.3)	3.362;	0.98	0.7122	1.3447	0.447
	≥40	176(65.2)	94(34.8)	0.339				
Gender	Female	225(53.4)	196(46.6)	5.948l	0.26	0.1817	0.3690	0.001
	Male*	235(81.6)	53(18.4)	0.001				
Years in practice				9.518;	2.75	1.9675	3.8334	0.001
	0-9	218(70.8)	90(29.2)	0.023				

≥10	142(47.1)	159(52.9)					
Location							
Rural /Periurban	118(67.8)	56(32.2)	3.645;	1.19	0.8265	1.7108	0.1763
Urban	342(63.9)	193(36.1)	0.162				
PPEs available							
Yes	443(66.9)	219(33.1)	18.209;	3.57	1.927	6.614	0.000
No*	17(36.2)	30(63.8)	0.001				
If special allowance is attached							
Yes	388(66.8)	193(33.2)	5.106;	1.56	1.059	2.308	0.012
No*	72(56.2)	56(43.8)	0.024				
If hazard allowance would be increased							
Yes	392(67.8)	186(32.2)	11.866;	2.29	1.5390	3.4051	0.000
No*	58(61.9)	63(48.1)	0.001				
I have been trained on IPC							
Yes	249(77.3)	73(22.7)	40.124;	2.85	2.048	3.953	0.000
No*	211(54.5)	176(45.5)	0.001				
I am not at risk of contracting COVID							
Yes	95(67.9)	45(32.1)	0.679;	1.18	0.796	1.750	0.207
No*	365(64.1)	204(35.9)	0.410				

Female were 3.8(1/0.26) times less likely to be willing to work as front line HCWs compared to male (OR 0.26; 95%CI 0.1817-0.3690) and this observation was found to be statistically significant (p 0.001). Respondents who have spent less than 10 years in practice were 2.75 times more likely to be willing to work as front line HCWs compared to those who have spent 10 years and above (OR 2.75; 95%CI 1.9675-3.8334) and this observation was found to be statistically significant (p 0.001). Apart from being a male (inverted OR 3.8) and spending less than 10 years in practice (OR 2.75), other predictors of willing to work as front line HCWs decided by OR values include if PPEs are available (OR 3.57); If special allowance is attached (1.56); If hazard allowance would be increased (OR 2.29); having been trained on IPC (Or 2.85) and believing that one is not at risk of contracting COVID (OR 1.18).

Discussion

Considering the vital role of front-line health care workers in providing care during infectious disease outbreaks, good understanding of the factors that could contribute to people's willingness to participate in the control of an outbreak is essential. The study therefore assessed the

willingness of health workers to work on the frontline as well as factors that may motivate or serve as a barrier to their willingness to work as frontline health workers during the COVID-19 pandemic.

Study findings indicate that lack of adequate equipment remains a major challenge to effectively manage the COVID-19 pandemic in Nigeria. Availability of personal protective equipment (PPE) could influence a self-risk perception in a positive way among health workers and could give them a sense of confidence to work during such high-risk situations. This corroborates the findings from Okechukwu and Motshedisi which reported low use of PPE among health workers [16]. In assessing the respondents' knowledge about the significance of frontline health workers during the COVID-19 pandemic, almost all the respondents claimed that they are all important with regards to the management of the novel coronavirus as majority of the respondents are fully involved in the identification and management of COVID-19 cases. A similar study among health workers in the response to an influenza pandemic depicted that health workers believed they were more important in the response towards an influenza pandemic.[17]

Willingness to join the team of frontline health workers in the management and control of COVID-19 should be primary obligation as health workers. This study showed that, two-third of the respondents are willing to be on the field, in isolation centres, in surveillance measures, in emergency and casualty care in a bid to manage the spread of the virus. Very few of them prefer to wait for government enforcement before joining the team of frontline health workers in the control of COVID-19. The finding from this present study is similar to the report documented in the middle-east where majority of doctors were willing to take part in the management and control of COVID-19 pandemic even if there is high surge of patients.[18]

In this present study, we investigated the barriers as well as factors that may motivate frontline healthcare workers during the COVID-19 pandemic; our findings revealed that a high proportion of the respondents did not have confidence in the government to handle any eventuality emanating from the infection. This finding is in keeping with that of Shanafelt, Ripp and Trockel where health workers indicated their desire to see leaders both within the hospital management as well as in government to frequently visit hospitals units that are caring for COVID-19 patients to regularly provide reassurance and to always make effort to address the needs of health workers.[19] Motivation of health workers and organizational trust are key factors in attenuating feeling of risk and contributing to a willingness to respond.[2021]

One of the major motivators indicated by health workers in this study was the availability of personal protective equipment. Almost all the respondents claimed that availability of PPE would motivate them even more to be on the frontline in the control of COVID-19. Furthermore, training of

health workers on the management and control of COVID-19 was revealed to be one of the major motivating factors to be on the frontline. This is not surprising because COVID- 19 is a novel disease therefore there is need for adequate provision of PPE, training, and re-training of health workers on infection prevention and control among frontline health workers in relations to COVID-19. This observation was similar to the findings of Dickson et al. that documented access to necessary PPE as a major concern among health workers.[21]

Some of the predictors for committing to work on the frontline during the COVID-19 pandemic as shown in this study include gender, years of practice, availability of PPE, availability of incentives, and adequate training on prevention and control of the infection as all these factors were shown to be statistically significant. Our finding in the present study is in consonance with a similar study conducted by Ran, Saad and Daniel on local public health workers' perceptions toward responding to Influenza pandemic, where majority of the respondents felt they benefit from additional training activities, availability of PPE and incentives.[22] Findings from this study have shown that males are more likely to be willing to work as frontline health workers. However, Ran, Saad and Daniel reported that age and gender did not have an association with the likelihood to report to work during an influenza pandemic.[22] In this study, special allowance as well as increment in hazard allowance appeared to be a significant predictor for willingness to be on the frontline during this pandemic. This is not surprising because it has been established that financial compensation to health workers during and after the pandemic is a major motivator.[23]

Recommendations

Findings from this present study revealed that availability of personal protective equipment could positively influence the perceptions of health workers and give them the confidence to work during such high-risk situations. Therefore, we call on all the stakeholders in the control of the pandemic including Federal Government, the State Government, the Local Government as well as various multinational organizations to make provision and regular supplies of PPE to health workers an obligation to reduce the risk of infection among them. This step will go a long way to reduce the fear and correct the erroneous impressions among the frontline health workers.

This study has also shown that capacity building for health workers is a vital condition to indicate willingness in the management and control of COVID-19 infection. This study therefore calls on all the well-meaning organizations, hospital managements and local authorities to invest heavily in building the capacity of their staff who are willing to be frontliners in the control of the pandemic.

We observed from this study that provision of adequate incentives could enhance the motivation and willingness of frontline health workers to participate in the control of the pandemic. We therefore advocate for adequate and regular provision of necessary remunerations by all the

concerned Ministries, Agencies and Parastatals. It is our belief that such palliatives will further boost the morale of the health workers to do more

Conclusions

Findings from this present study suggest that availability of PPE, allocation of incentives and remunerations, adequate training and capacity building and assurance of trust and confidence from the government and employers if infected on the job are important determinants of willingness of frontline health workers. However, in order to facilitate better participation among frontline health workers health workers, it is imperative for relevant authorities to take necessary measures to prevent barriers in order to reinforce willingness. Healthcare system should ensure that they provide frontline health workers with necessary support and resources they need to enable them to perform more effectively.

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Competing Interests

The authors declare that they have no competing interests.

Authors' contributions

Conceptualization/Study design: AWA, IDO, AAA, OMM, OS; Data collection: All authors; Data analysis: IDO, AWA, AAA; Writing – original draft: OMO, FMM, AAA, IA; Writing – review & editing: All authors

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