RESEARCH ARTICLE

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Comparing the family characteristics, professional profile, and personality traits of COVID-19 volunteer and nonvolunteer frontline healthcare workers at the epicenter in Nigeria

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Abstract

Background: Emergency volunteering becomes a necessity in the face of unprecedented disasters like the coronavirus disease 2019 (COVID-19) pandemic. There is a paucity of empirical data on volunteerism not imported from the developed countries. It became necessary to evaluate the local-bred volunteerism with its peculiarity, as it emerged within the public health sector of Nigeria's COVID-19 epicenter.

Objectives: To compare the family characteristics, professional profiles, and personality traits of volunteer and nonvolunteer COVID-19 frontline healthcare workers (HCWs). To determine the significant predictors of volunteering as well as the deterrents to and motivation for volunteering.

Method: A comparative cross-sectional study was conducted between May and August 2020 among COVID-19 volunteer and nonvolunteer HCWs serving at the six dedicated COVID-19 isolation/treatment centers and the 27 general hospitals, respectively. Using a stratified sampling technique, three professional categories of HCWs (doctors, nurses, and medical laboratory scientists) were randomly selected from the nonvolunteers while total enumeration of volunteers was done. The survey employed pilot-tested self-administered questionnaires. The univariate, bivariate, and multivariate analyses were carried out with IBM Statistical Package for Social Sciences (SPSS) version 23.0. The level of statistical significance was determined by a *P*-value of <.05.

Results: A total of 244 volunteers and 736 nonvolunteers HCWs participated in this survey. Sex, ethnicity, professional level, income level, number of years of practice, and traits of agreeableness and conscientiousness were significantly different between volunteers and nonvolunteers (*P* < .05). Inadequate personal protective equipment (PPE), lack of insurance, and inadequate hazard allowance deterred nonvolunteers. After regression analysis, the significant predictors of volunteerism included sex (odds ratio [OR] = 2.644; confidence interval [CI]: 1.725-4.051),

ethnicity (OR = 2.557; CI: 1.551-4.214), and professional level (matrons: OR = 0.417; CI: 0.254-0.684, consultants: OR = 0.171; CI: 0.038-0.757).

Conclusion: HRH crisis in the face of high-danger situations such as the COVID-19 pandemic makes it urgent for health policymakers to address the identified barriers to volunteerism in order to optimize the health outcomes of the population.

1 | INTRODUCTION

The world faces a severe and acute public health emergency due to the ongoing coronavirus disease 2019 (COVID-19) global pandemic.[1] Thus far, 218 countries have reported 90.4 million confirmed cases of the coronavirus, and 1.94 million deaths as of January 11, 2021[2] Total cases of COVID-19 from 55 African countries were over three million cases with 72 121 reported deaths. While in Nigeria, about 100 000 cases and 1358 deaths had been reported by January 11, 2021.[3] Beyond the tragic health hazards and human consequences of the COVID-19 pandemic, the economic uncertainties and disruptions that have resulted come at a significant cost to the global economy.

Healthcare workers (HCWs) play a key role in any response to a pandemic and are in the frontline of exposure to infection. Some significant barriers that may prevent HCWs from volunteering during pandemics have been identified. These barriers included ill health, transport difficulties, childcare responsibilities, prioritizing the well-being of family members, a lack of trust in and goodwill toward the healthcare system, a lack of information about the risks and what is expected of them during the crisis, fear of litigation, and the feeling that employers do not take the needs of staff seriously.[4]

Africa has been facing unprecedented human resources for health (HRH) crisis for years. Indeed, Africa possesses 14% of the world population, harbors 25% of the global disease burden, and has only 1.3% of global health workers. In the era of the Millennium Development Goals, an estimated 2.5 health workers per 1000 inhabitants was required. Out of 57 countries experiencing critical HRH shortages in the world, 36 are located in Africa.[5]

However, the current health worker/population ratio in Africa is only 2.3 health workers per 1000 inhabitants. In Nigeria, public healthcare faces several difficulties including a low ratio of doctors at only 1 per 2,000 inhabitants and an infrastructure struggling to cope.[5]

Chronic underinvestment in health, weak planning, poor working conditions, inadequate incentive systems, frustrating out-of-date regulations, and management approaches have resulted in a serious brain drain of skilled health staff.[5]

The beneficial effects of volunteering on health outcomes have been well documented. Research has found that participation in voluntary services is significantly predictive of better mental and physical health, life satisfaction, self-esteem, happiness, lower depressive symptoms, psychological distress, and mortality and functional inability.[6,7]

Indeed, many volunteers in developed countries provide their services in Africa and other developing countries. Unfortunately, there is a paucity of information on local studies on volunteerism not imported from the developed countries.[8]

It thus became necessary to evaluate the local-bred volunteerism in the health sector in Lagos, Nigeria, where volunteerism was utilized in the wake of the COVID-19 pandemic. The State's policy on case management resulted in some dichotomy of what is defined as a frontline worker, as COVID-19 cases were to be managed in dedicated isolation/treatment centers by volunteer medical staff from the government hospitals who, having been trained and deployed, will be remunerated with monetary incentives in addition to their regular salaries.

Much has been studied as regards the need for volunteerism, useful incentives, and the deterrents to it.[9-16] However, there is a paucity of peer-reviewed materials on what motivates people to volunteer in high-danger situations such as an epidemic or pandemic.[17] Additionally, more literature focusing on developing countries and low-resource settings is needed. While existing literature details the association between certain socio-demographic characteristics and volunteerism, there is a dearth of research addressing whether and what intrinsic traits, family, and professional characteristics spur medical volunteering.

This study aimed to plug the aforementioned gaps, to extend current knowledge, and to provoke further research focusing on the subject matter. Ultimately, it compared the family characteristics, professional profiles, and personality traits of volunteer and non-volunteer COVID-19 frontline health workers in Lagos and addressed the question of whether these variables impact medical volunteerism in the Nigerian context.

1.1 | Objectives

To compare the family characteristics, professional profiles, and personality traits of volunteer and nonvolunteer COVID-19 frontline health workers.

To determine the deterrents/barriers to volunteering among the nonvolunteers.

To identify factors that are significant to volunteering and the sources of motivation among the volunteers.

2 | METHODS

2.1 | Study design

A comparative cross-sectional study of COVID-19 volunteer and nonvolunteer HCWs.

2.2 | Study setting

The study was set around the organizational structure of the public health sector under the health resource management of the Lagos State Health Service Commission, which oversees the 27 General Hospitals in Lagos State. It is an arm of the State Ministry of Health, which is responsible for all activities regarding the response to the COVID-19 pandemic. The state had six isolation and treatment centers at the time of this study. Lagos is the most populous state and the epicenter of the COVID-19 pandemic in Nigeria. As of 2016, its population had exceeded 21 million. The vast majority of the population depend on the public health sector for their healthcare needs.

2.3 | Study population

Three professional categories of frontline HCWs (doctors, nurses, and laboratory scientists) in the employment of the Lagos State Health Service Commission, working at the General Hospitals in Lagos before the COVID-19 pandemic. The total population of doctors (1188), nurses (2378), and lab scientists (174) is 3740. The total population of doctors (328), nurses (364), and lab scientists (56) that volunteered to serve at COVID-19 isolation and treatment centers in Lagos was 748, but a total of 244 volunteers (72 doctors, 158 nurses, and 14 medical laboratory scientists) had been deployed to the centers during the study period.

2.4 | Sampling size and sampling techniques

The sample size was calculated using the statistical formula for cross-sectional quantitative surveys. Given a standard normal deviate of 1.96, desired level of precision of 0.05, and 50% (0.5) as the proportion that will yield the largest sample size required to draw valid conclusions in the absence of data from previous studies on this subject, a sample size of 384 was calculated for both volunteer and nonvolunteer population groups. Since both populations were finite (<10 000), and the calculated sample size exceeded 5% of population size, application of a correction formula yielded a minimum sample size of 149 for the volunteer group and 340 for the group of nonvolunteers.

Total enumeration of all volunteers (244) working at the centers was done. Given the professional stratification of the population groups, samples proportional to the sizes of the professional strata were randomly selected using stratified sampling technique. A sample of 340 nonvolunteering HCWs, when proportionally allocated comprised 98 doctors, 229 nurses, and 13 laboratory scientists.

2.5 | Selection criteria

Frontline HCWs who were doctors, nurses, and laboratory scientists currently working at the General Hospitals in Lagos or serving as volunteers at the Lagos State isolation and treatment centers during the study period. Consenting non-volunteer health workers participated in the online survey until the minimum sample size estimated for each stratum of nonvolunteer HCWs was exceeded.

2.6 | Materials

The research questionnaire comprised four parts.

1. Socio-demographic and family characteristics: This section captured information about gender, age, religion, ethnicity, monthly income, marital status, duration of the marriage, family developmental stage (using Duvall developmental stages[18]), family size, age of the last child, and the number of dependents.
2. Professional profile: This included the professional categories, highest degree qualification, professional level, and duration of professional practice.
3. Big Five-Factor Model (BFFM) Test: The test used the BFFM from the International Personality Item Pool (IPIP), which was developed by Goldberg Lewis. R in 1992.[19] It is a 50-item questionnaire rated on a five-point Likert scale where 1 = very inaccurate, 2 = moderately inaccurate, 3 = neither accurate nor inaccurate, 4 = moderately accurate, and 5 = very accurate. The 50 items consist of 10 items for each of the BFFM personality factors as follows: *Extraversion* implies an outgoing, sociable, or friendly disposition. Low scorers tend to be shut-ins. *Neuroticism* represents emotional stability or negative emotionality. *Agreeableness* indicates courteousness, optimism, or friendliness. Low scorers are critical and aggressive. High scores for *Conscientiousness* are diligent, careful, dutiful, reliable, and well-organized, while low scorers are impulsive and disorganized. Lastly, *openness to new experience* denotes curiosity, adventurous disposition, and high capability for abstract thinking. Those who score low are traditional and conventional.[19] For each of the items, "I" was added at the beginning so that the items would be easier to read and personalize. The items were grouped into positively and negatively keyed items. Items from the same factor are listed separately to enhance an accurate rating by the respondents. Negatively keyed items are scored in the inverse direction, and the scores for each factor of personality traits are rated in percentages.[19] It takes most people 3 to 8 minutes to complete, and it has been validated and has good internal consistency.[20]
4. The items measuring motivation for volunteering elicited the major factors/barriers that may influence volunteerism in non-volunteers and if they would be willing to volunteer if thefactors/conditions

TABLE 1 Comparison of the socio-demographic, professional, and family characteristics of volunteers and nonvolunteers

Variable	Frequency (%)		χ^2	P-value
	Non-volunteers n = 736	Volunteers n = 244		
Age				
18-44	511 (69.4)	175 (71.7)	1.991	.370
45-59	214 (29.1)	68 (27.9)		
≥ 60	11 (1.5)	1 (0.4)		
Sex				
Male	170 (23.1)	79 (32.4)	8.325	.004[a]
Female	566 (76.9)	165 (67.6)		
Ethnicity				
Yoruba	631 (85.7)	185 (75.8)	20.498	<.001[a]
Igbo	57 (7.7)	41 (16.8)		
Hausa	2 (0.3)	3 (1.2)		
Others	46 (6.3)	15 (6.1)		
Religion				
Christianity	585 (80.4)	188 (77.0)	2.266	.322
Islam	141 (19.4)	54 (22.1)		
Others	2 (0.3)	2 (0.8)		
Monthly income (NGN)				
< ₦100 000	161 (22.1)	56 (23.0)	11.853 (5.990)[b]	.008[a] (.014)[b]
₦101 000-₦200 000	303 (41.6)	122 (50.0)		
₦201 000- ₦400 000	203 (27.9)	59 (24.2)		
> ₦400 000	61 (8.4)	7 (2.9)		
Marital status				
Single	139 (18.9)	61 (25.0)	6.630	.085
Married	567 (77.0)	173 (70.9)		
Divorced	3 (0.4)	3 (1.2)		
Widowed	27 (3.7)	7 (2.9)		
Occupation				
Laboratory Scientists (MLS)	61 (8.3)	14 (5.7)	2.286	.319
Nurse	445 (60.5)	158 (64.8)		
Medical Doctor	230 (31.3)	72 (29.5)		
Academic qualification				
ND	33 (4.5)	14 (5.7)	0.945	.815
HND/BSc/BNSc	438 (60.2)	144 (59.0)		
MBBS	192 (26.4)	67 (27.5)		
Postgraduate	65 (8.9)	19 (7.8)		
Professional level				
Nursing Officer/Senior Nursing Officer	261 (35.5)	89 (36.5)	200.069 (41.833)	<.001[a] (<.001)[b]
Principal Nursing Officer/Chief Nursing Officer	0	44 (18.0)		
Matron/ Chief Matron/Assistant Director/Director of Nursing services	197 (26.8)	25 (10.2)		
Medical Officer/Senior Medical Officer	94 (12.8)	63 (25.8)		
Principal Medical Officer/Chief Medical Officer	42 (5.7)	3 (1.2)		
Registrar/Senior Registrar	60 (8.2)	4 (1.6)		
Consultant	27 (3.7)	2 (0.8)		
Laboratory Scientist/Senior Laboratory Scientist	33 (4.5)	8 (3.3)		
Principal Laboratory Scientist/Chief Laboratory Scientist/ Assistant Director/Director of laboratory services	22 (3.0)	6 (2.5)		

TABLE 1 (Continued)

Variable	Frequency (%)		χ^2	P-value
	Non-volunteers n = 736	Volunteers n = 244		
Number of years of marriage				
<1	20 (3.4)	7 (4.0)	2.249	.325
1-5	116 (20.0)	44 (25.0)		
>5	444 (76.6)	125 (71.0)		
Family size				
2	66 (11.1)	24 (12.6)	0.771	.680
3-5	457 (76.8)	140 (73.7)		
≥ 6	72 (12.1)	26 (13.7)		
Family developmental stage				
Beginning families (married couple without children	63 (10.9)	15 (8.3)	5.040	.655
Childbearing families (oldest child birth to 30 months)	52 (9.0)	22 (12.2)		
Families with preschool children (oldest child 2½-6 years)	98 (16.9)	35 (19.4)		
Families with school children (oldest child 6-12 years)	177 (30.6)	46 (25.6)		
Families with teenagers (oldest child 13-20 years)	135 (23.3)	45 (25.0)		
Families as launching centers (first child gone to last child's leaving home)	29 (5.0)	11 (6.1)		
Families in the middle year (empty nest to retirement)	24 (4.1)	6 (3.3)		
Families (retirement)	1 (0.2)	0		

[a]Statistically significant.
[b]The Linear by Linear Association test.

were present and barriers addressed. The items also explored what volunteering to work at the Covid-19 isolation and treatment centres meant to the volunteers and their major motivations.

2.7 | Data collection procedure

The survey employed a self-administered questionnaire presented via Google form and a paper version as required by the participants. It was conducted over 11 weeks, between May and August 2020. Each study group had a specific questionnaire similar in composition except for the items assessing motivation for or deterrents to volunteering or not volunteering.

The questionnaire captured information about the socio-demographic and family characteristics, professional profile, personality traits, motivations for volunteering, and deterrents to non-volunteering. The personality traits of the participants were measured with the BFFM from the IPIP (BFFM IPIP).[19] The questionnaire was pilot-tested for face validity and reliability. Reliability measurements of internal consistency (Cronbach's alpha reliability coefficient of 0.85) and split-half reliability (Guttman coefficient of 0.89) were good.

Items were checked for clarity, and familiar synonyms were included in parentheses for some of the BFFM items identified at the pilot phase:

Item 20: "vocabulary"—"a full bank of words."
Item 25: "abstract"—"nonphysical/theoretical."
Item 30: "vivid"—"clear."
Item 34: "seldom"—"rarely."
Items 34 and 64: "blue"—"sad."
Item 38: "chores"—"tasks."
Item 53: "shirk"—"avoid."
Item 63: "exacting"—"rigorously demanding."

2.8 | Data analysis

Data were analyzed with the Statistical Package for Social Sciences (SPSS) version 23.0 (IBM Corp. 2015, Armonk, New York). The results are presented with tables. Continuous variables were presented in means and standard deviation (SD), while categorical variables were presented in proportions. Parametric (independent t-test, analysis of variance) and non-parametric (Chi-square test, Mann Whitney U-test, and logistic regression) statistical tests were used to compare continuous variables and categorical variables, respectively, between the two groups. Regression analysis was carried out to minimize confounding bias and to determine the variables that significantly predicted volunteerism. The level of statistical significance was determined by a P-value of <.05.

2.9 | Ethics statement

Ethical approval to conduct the study was obtained from the HREC of the authors' institution. Informed consent was granted by the

participants and permission from the Health Service Commission. The privacy and confidentiality of the respondents were guaranteed by ensuring anonymity. Ethical approval was received from the HREC of General Hospital Lagos, which approved the research with reference number SUB/GHL/1288/59.

3 | RESULTS

Table 1 compares the socio-demographic, professional, and family characteristics of volunteer and non-volunteer COVID-19 HCWs in Lagos State in the wake of the COVID-19 pandemic. Young adults (18-44 years) accounted for 71.7% of volunteers and 69.4% of non-volunteers, while 27.9% and 29.1% of volunteers and non-volunteers, respectively, were middle-aged adults (45-59 years). However, the difference in the age distribution between the two groups was not statistically significant. A higher proportion of males were in the volunteer group, 32.4%, when compared with the nonvolunteers, 23.1%, and the difference in proportions was found to be statistically significant, ($\chi 2 = 8.325$, $P = .004$). However, they were not significantly different with regard to religion ($P = .322$). There were more Igbo and Hausa volunteers; 16.8% and 1.2% than their non-volunteering counterpart; 7.7% and 0.3%, respectively. The difference in proportions was found to be statistically significant, thus indicating a significant association between ethnicity and volunteering ($\chi 2 = 20.498$, $P < .001$).

There were more volunteers (23.0% and 50.0%) compared to nonvolunteers (22.1% and 41.6%) among the lowest income earners (≤₦100 000 and ₦101 000-₦200 000). The difference in proportions was also found to be statistically significant ($\chi 2 = 5.990$, $P = .014$).

A decreasing trend was observed in the proportions of volunteers and nonvolunteers as their income levels increased, and this was statistically significant ($P = .014$) as shown in the Chi-square for trends analysis (linear by linear association test). The majority of volunteers (70.9%) and nonvolunteers (77%) were married, but there was no significant difference between them in relation to marital status ($P = .085$). Concerning professional characteristics, a higher proportion of the Nursing Officers/Senior Nursing Officers, Principal Nursing Officers/Chief Nursing Officers, and Medical Officers/Senior Medical Officers were in the volunteer group, 36.5%, 18.0%, and

25.8% when compared with the nonvolunteers, 35.5%, 0%, and 12.8%, respectively. The difference in proportions was found to be statistically significant ($\chi 2 = 41.833$, $P < .001$). The difference

TABLE 3 Comparison of each personality trait between volunteers and non-volunteers by occupation

Variables	Non-volunteers n = 736		Volunteers n = 244	
	Mean	(std)	Mean	(std)
Extroversion				
Laboratory Scientist	47.05	11.24	50.18	9.27
Nurse	47.38	12.69	45.77	14.00
Medical Doctor	44.46	14.13	49.41	13.18
$F_{2,733}$ (p)	3.867 (0.021)[a]		2.164 (0.117)	
Agreeableness				
Laboratory Scientist	83.69	11.74	78.57	14.73
Nurse	81.95	14.31	80.05	15.95
Medical Doctor	80.08	12.62	72.60	16.09
$F_{2,733}$ (p)	2.298 (0.101)		5.419 (0.005)[a]	
Conscientiousness				
Laboratory Scientist	82.46	11.12	81.61	11.21
Nurse	78.25	12.80	76.71	14.42
Medical Doctor	75.47	12.60	69.86	16.00
$F_{2,733}$ (p)	8.377 (<0.001)[a]		6.829 (0.001)[a]	
Neuroticism				
Laboratory Scientist	69.38	12.88	67.14	16.52
Nurse	64.53	15.10	63.29	16.07
Medical Doctor	63.08	18.20	61.63	17.15
$F_{2,733}$ (p)	3.764 (0.024)[a]		0.720 (0.488)	
Agreeableness				
Laboratory Scientist	73.20	11.41	73.03	12.25
Nurse	70.38	11.99	69.45	11.71
Medical Doctor	69.83	12.45	67.64	14.64
$F_{2,733}$ (p)	1.889 (0.152)		1.212 (0.299)	

[a]Significant at 5%.

TABLE 2 Comparison of the family and professional characteristics of volunteers and nonvolunteers

Variables	Non-volunteers n = 736		Volunteers n = 244		t	df	P
	Mean	std	Mean	std			
Age of the last child (months)	80.82	127.98	77.62	165.10	0.261	691	.794
	Median = 50.00		Median = 48.00		MWU Z = −0.811 (0.418)		
Number of dependents	6.51	5.51	8.12	17.66	−1.403	259	.162
	Median = 5.00		Median = 6.00		MWU Z = −1.170 (0.242)		
Number of years of practice	12.59	9.22	11.71	9.19	1.288	970	.198
	Median = 10.00		Median = 10.00		MWU = −2.238 **(0.025)***		

Abbreviation: MWU, Mann–Whitney U-test.

TABLE 4 Comparison of the personality traits of the volunteers and non-volunteers by occupation

Variables	Non-volunteers n = 736		Volunteers n = 244		t	P
	Mean	(std)	Mean	(std)		
Extroversion	46.44	13.10	47.10	13.61	−0.679	.497
95% CI	45.49-47.38		45.38-48.82			
Agreeableness	81.51	13.63	77.77	16.21	+3.542	<.001[a]
95% CI	80.52-82.50		75.72-79.81			
Conscientiousness	77.73	12.73	74.97	15.10	+2.798	.005[a]
95% CI	76.81-78.65		73.06-76.87			
Neuroticism	64.48	16.04	63.02	16.40	1.221	.223
95% CI	63.32-65.64		60.95-65.09			
Openness	70.44	12.10	69.12	12.68	1.458	.145
95% CI	69.56-71.31		67.52-70.72			
Medical Laboratory Scientist						
Extroversion	47.05	11.24	50.18	9.27	−0.967	.337
95% CI	44.17-49.93		44.82-55.53			
Agreeableness	83.69	11.74	78.57	14.73	1.401	.165
95% CI	80.68-86.69		70.06-87.08			
Conscientiousness	82.46	11.12	81.61	11.21	0.258	.797
95% CI	79.61-85.31		75.14-88.08			
Neuroticism	69.38	12.88	67.14	16.52	0.556	.580
95% CI	66. 08-72.68		57.60-76.68			
Agreeableness	73.20	11.41	73.03	12.25	0.047	.963
95% CI	70.27-76.12		65.96-80.11			
Nurse						
Extroversion	47.38	12.69	45.77	14.00	1.325	.186
95% CI	46.19-48.56		43.57-47.97			
Agreeableness	81.95	14.31	80.05	15.95	1.396	.163
95% CI	80.62-83.29		77.54-82.55			
Conscientiousness	78.25	12.80	76.71	14.42	1.259	.209
95% CI	77.06-79.44		75.14-78.97			
Neuroticism	64.53	15.10	63.29	16.07	0.870	.385
95% CI	63.12-65.93		60.77-65.81			
Agreeableness	70.38	11.99	69.45	11.71	0.843	.400
95% CI	69.26-71.49		67.60-71.29			
Medical Doctor						
Extroversion	44.46	14.13	49.41	13.18	−2.636	.009[a]
95% CI	42.62-46.29		46.31-52.51			
Agreeableness	80.08	12.62	72.60	16.09	+4.091	<.001[a]
95% CI	78.44-81.72		68.82-76.82			
Conscientiousness	75.47	12.60	69.86	16.00	+3.080	.002[a]
95% CI	73.83-77.10		66.10-73.62			
Neuroticism	63.08	18.20	61.63	17.15	.595	.552
95% CI	60.71-65.44		57.60-65.66			
Openness	69.83	12.45	67.64	14.64	+1.246	.214
95% CI	68.21-71.44		64.20-71.08			

[a]Significant at 5%.

Note: Variance not same but conclusion same whether same or not.

TABLE 5 Potential sources of motivation/deterrents for nonvolunteers and motivating factors for volunteers

Nonvolunteers		Volunteers	
Deterrents/potential motivation for volunteering	Yes (%)	Personal meaning of volunteering	Yes (%)
Inadequate personal protective equipment (PPE)	593 (80.6)	A call to serve	155 (63.5)
Would volunteer if all deterrents are addressed and potential motivating factors are present	491 (66.7)	An act of self-sacrifice	140 (57.4)
Adequate training to manage Covid-19 cases	460 (62.5)	An act of patriotism	57 (23.4)
Attractive remuneration	451 (61.3)	An act of Godliness	38 (15.6)
Conducive work environment at the isolation centres	404 (54.9)	An adventure	32 (13.1)
Lack of insurance	400 (54.3)	A profitable investment	26 (10.7)
Inadequate hazard allowance	282 (38.3)		
Recognition/certification	195 (26.5)		
Medical conditions		Motivation for volunteers	
Pre-existing medical condition that may prevent you from volunteering to work at a COVID-19 isolation center	99 (13.5)	Love for humanity	181 (74.2)
Cardiovascular diseases (hypertension and heart disease)	37 (5.0)	Love for profession	123 (50.4)
Others	34 (4.6)	The feeling of relevance	76 (31.1)
Respiratory disease (asthma, COPD)	20 (2.7)	Volunteer renumeration package	41 (16.8)
Multiple conditions	15 (2.0)	Love for family	18 (7.4)
Endocrine and metabolic diseases (diabetes mellitus and obesity)	4 (0.5)	Medical conditions	5 (2.0)
Chronic kidney disease	3 (0.4)		
Liver impairment/disease	2 (0.3)		

between the groups was significant across professional levels ($P < .001$), and a decreasing trend in volunteerism was observed with increasing professional ranking as depicted by the Chi-square for trends analysis ($P < .001$). However, the groups were not significantly different across the occupational categories that were studied ($P = .319$) and academic qualifications ($P = .815$). Concerning family characteristics, volunteers and nonvolunteers did not differ significantly with regard to years of marriage ($P = .325$), family size ($P = .68$), and family stage ($P = .655$).

As shown in Table 2, the difference in the average age of the last child between volunteers (48 months) and nonvolunteers (50 months) was not statistically significant ($P = .418$). The number of dependents between the two groups was also not significantly different ($P = .242$). The mean number of years of practice in the volunteer group, 11.71 ± 9.19, (median 10 years) was lower than that in the non-volunteer group, 12.59 ± 9.22 (median, 10 years), and the difference in mean was found to be statistically significant (Mann Whitney = 2.238, $P = .025$).

Table 3 shows statistically significant differences in extroversion ($P = 0.021$),conscientiousness ($P < 0.001$) and neuroticism ($P = 0.024$) amongst non-volunteers across the three professional categories. The traits of agreeableness and conscientiousness were also significantly different amongst volunteers ($P = 0.005$ and $P = 0.001$ respectively).

In Table 4, agreeableness and conscientiousness were the two traits that were significantly different between volunteers and non-volunteers in general ($P < .05$). However, volunteer doctors

significantly differed from their non-volunteer counterparts in extroversion, agreeableness, and conscientiousness ($P < .05$). On the other hand, volunteer and non-volunteer medical laboratory scientists and nurses did not differ significantly in any of the personality traits ($P > .05$).

Table 5 shows the motivation for volunteers and the deterrents/potential sources of motivation for nonvolunteers. The majority of nonvolunteers would have been motivated to volunteer their services at the COVID-19 isolation centers by the availability of adequate personal protective equipment (PPE) (80.6%), adequate training to manage COVID-19 cases (62.5%), attractive remuneration (61.3%), conducive work environment (54.9%), and insurance (54.3%). About 14% of nonvolunteers had pre-existing medical conditions that could have deterred them from volunteering to work at a COVID-19 isolation center. On the other hand, the majority of volunteers (63.5%) regarded volunteering as a call to serve or an act of self-sacrifice (57.4%). The motivation for volunteers includes love for humanity (74.2%), love for the profession (50.4%), feeling of relevance (31.1%), and the volunteer remuneration package for working at an isolation center (16.8%).

Sex, ethnicity, and professional levels were significant factors in volunteering to work at COVID-19 isolation centers in Nigeria's epicenter as shown in Table 6. Male healthcare professionals are two and half times more likely to volunteer than their female counterparts, and the odds ratio (OR) is significant (OR = 2.644; CI: 1.725-4.051). Regarding ethnicity, Igbo healthcare professionals were two and half times more likely to volunteer than their Yoruba counterparts, and the

TABLE 6 Logistic regression analysis of the factors that were significant to volunteering

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B) Lower	Upper
Gender								
Female	1							
Male	0.972	0.218	19.934	1	<0.001	2.673	1.725	4.051
Ethnicity								
Yoruba	1		16.385	3	0.001			
Igbo	0.939	0.255	13.559	1	<0.001	2.557	1.551	4.214
Hausa	1.855	0.979	3.588	1	0.058	6.391	.938	43.561
Others	0.058	0.356	.026	1	0.871	1.059	.528	2.127
Monthly income (NGN)								
≤100 000	1		1.574	3	.665			
101 000-200 000	.026	.230	.013	1	.910	1.026	.654	1.611
201 000-400 000	−.236	.326	.521	1	.470	.790	.417	1.498
> 400 000	−.562	.638	.777	1	.378	.570	.163	1.990
Professional level								
Nursing officer/Senior nursing officer	1		49.746	8	<0.001			
Principal Nursing Officer/Chief Nursing Officer	22.472	5972.260	0.000	1	0.997	5 746 328 829.575	.000	
Matron/Chief Matron/ADNS	−0.875	0.253	11.992	1	0.001	0.417	0.254	0.684
Medical Officer/Senior Medical Officer	0.261	0.232	1.270	1	0.260	1.299	0.824	2.046
Principal Medical Officer/Chief Medical Officer	−1.988	0.631	9.945	1	0.002	0.137	**0.040**	0.471
Registrar/Senior Registrar	−2.317	0.568	16.624	1	<0.001	0.099	0.032	0.300
Consultants	−1.769	0.760	5.415	1	0.020	0.171	0.038	0.757
Laboratory Scientist/Senior Laboratory Scientist	−0.731	0.436	2.808	1	0.094	0.481	0.205	1.132
Principal Laboratory Scientist/Chief Laboratory Scientist	−0.443	0.504	0.775	1	0.379	0.642	0.239	1.723
Personality traits								
Extroversion	0.003	0.007	0.251	1	0.616	1.003	0.990	1.017
Agreeableness	−0.015	0.009	2.651	1	0.104	0.986	0.968	1.003
Conscientiousness	0.002	0.009	0.060	1	0.806	1.002	0.984	1.021
Neuroticism	−0.002	0.006	0.059	1	0.808	0.998	0.986	1.011
Openness	0.005	0.009	0.319	1	0.572	1.005	0.987	1.024
Constant	−0.807	0.650	1.543	1	0.214	0.446		

Note: Variable(s) entered: Gender, ethnicity, professional level, extroversion, agreeable, conscientious, neuroticism, and openness.

OR is significant (OR = 2.557; CI: 1.551-4.214). Regarding the professional level, senior-level HCWs were less likely to volunteer compared to the junior-level HCWs across the three groups of health professionals in the study. Personality traits did not significantly predict volunteerism.

4 | DISCUSSION

The study compared the socio-demographic, professional, family characteristics, and personality traits of two groups of HCWs in the public health sector of Nigeria's COVID-19 epicenter; those who volunteered to work at the Lagos State dedicated COVID-19 isolation/treatment centers and the nonvolunteers who remained at the General Hospitals and found sex, ethnicity, professional level, income level, number of years of practice, and personality traits of agreeableness and conscientiousness to be significantly different between volunteers and nonvolunteers while sex, ethnicity, and professional level were the significant predictors of volunteerism in the final analysis.

Also, the study identified the leading motivation for volunteerism as love for humanity, love for profession, feeling of relevance, and the volunteer remuneration package for working at an isolation center. The latter finding aligns with the literature report of community appreciation, volunteer allowances, and remuneration, among others, as sources of motivation for HCWs.[9-16]

Commitment to serving the community and feeling like a part of it was cited by a study done in China that explored the reasons why people volunteer.[17]

Nonvolunteers reported inadequate PPE, lack of insurance, inadequate hazard allowance, and pre-existing medical conditions as the major deterrents to volunteering to work at the COVID-19 isolation/treatment centers. This also aligns with the report of barriers such as ill-health, a lack of information about the risks and what is expected of them during the crisis, fear of litigation, and the feeling that employers do not take the needs of staff seriously.[4]

Evidence has also shown that intrinsic factors like functional and physical disability, low self-esteem, and transition into parenthood constitute barriers to volunteering.[21]

Our findings lend credence to the demotivating influence of physical health conditions in 13.5% of the nonvolunteers, but family characteristics such as family developmental stage, family size, or the number of years of marriage were not significant factors. While self-esteem was not measured in this study, personality traits of agreeableness and conscientiousness differed significantly between volunteers and nonvolunteers. Some academic schools of thought have postulated that being a volunteer may be intrinsically rooted, and some researchers have found an association between volunteering and personality traits of conscientiousness, agreeableness, and extraversion as well as constructs such as altruism.[22,23]

Comparison is impeded by the dearth of empirical data, more so in the African context, elucidating the roles of personality traits, family characteristics, and professional profile in medical volunteering. This study provides evidence to stimulate and provoke further research on the subject matter as it contributes to one of the earliest empirical data on factors that are associated with medical volunteering in high-danger situations such as an epidemic or pandemic.

5 | LIMITATION

The study findings may not be generalizable to HCWs in different settings. Other professional categories of HCWs such as pharmacists, physiotherapists, nutritionists, and psychologists were not included in the survey.

6 | RECOMMENDATION

The authors recommend future cohort studies that will explore the experience of medical volunteering as well as its physical and psychological health benefits.

7 | CONCLUSION

There is increasing awareness of the usefulness of volunteer services, and emergency volunteering has established itself as a necessity and an aid of immense proportions particularly in times of overwhelming disasters like the COVID-19 pandemic. Ultimately, the ability of HCWs to deliver effective services depends on factors such as motivation. The findings from this study suggest that there are important factors to consider in opening the door to local-bred medical volunteerism in the Nigerian context and the evidence it provides supports the introduction of policies to foster it.

CONFLICT OF INTEREST
The authors have none to declare.

AUTHOR CONTRIBUTION
Olawunmi Olagundoye: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Writing-original draft, Writing-review & editing
Oluremi Adewole: Conceptualization, Funding acquisition, Investigation, Resources, Validation, Writing-review & editing
Tolulope Onafeso: Conceptualization, Investigation, Methodology, Resources, Writing-review & editing
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Folasade Amosun: Funding acquisition, Investigation, Project administration, Resources, Supervision

All authors have read and approved the final version of the manuscript.

Olawunmi Olagundoye (corresponding author/manuscript guarantor) had full access to all of the data in this study and takes complete responsibility for the integrity of the data and the accuracy of the data analysis.

TRANSPARENCY STATEMENT
Olawunmi Olagundoye affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

DATA INTEGRITY SECTION
The data generated from the study are available from the corresponding author upon reasonable request.

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