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Psychosocial Impact of COVID-19 on Frontline Healthcare Workers at a Tertiary Healthcare Facility in Northwest Nigeria

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Abstract

Background: The emergence of COVID-19 and its variants have globally impacted many nations, significantly affecting the healthcare sector and workers in Nigeria. This study assessed the psychosocial impact of COVID-19 on frontline healthcare workers (HCWs).

Method: Adopting cross-sectional design, a total enumeration (census sampling) of 97 healthcare workers (HCWs) at a tertiary healthcare facility in northwest Nigeria was conducted to assess the psychosocial impact of COVID-19. Data was collected using an adapted PTSD Checklist for DSM-5 and Perceived Discrimination scales, and analysed with the aid of SPSS version 23.0. The study employed mean and standard deviation to determine the level of psychosocial impact, while Chi-square tests evaluated associations between COVID-19's impact and socio-demographic characteristics with significance set at $P \leq 0.05$.

Results: The findings revealed that the psychological and social impacts of COVID-19 among HCWs were predominantly categorized as low. The majority of HCWs experienced low levels of psychological impact, with mean scores falling within the low impact range (1.0–1.9), and low social impact, with scores also within the low range (1.06 ± 1.11). Significant associations were identified between the categorized impact levels and various factors, including gender (p=0.000), age (p=0.000), work experience (p=0.000), cadre (p=0.000), highest educational level (p=0.000), formal training before placement at the COVID-19 centre (p=0.000), tribe (p=0.000), religion (p=0.002), number of dependents (p=0.000), and hours per call (p=0.000).

Conclusion: The study reveals low psychological and social impacts of COVID-19 on frontline healthcare workers, influenced by socio-demographic factors like gender, age, work experience, and work hours. Subsequent emergency preparedness and activation however needs to take these factors in consideration.

Keywords: Psychosocial impact, COVID-19, Frontline healthcare workers, Stigmatization, Discrimination, Nigeria.

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Introduction

On January 9, 2020, China reported a COVID-19 outbreak caused by the novel coronavirus 2019-nCoV, linked to MERS-CoV and SARS-CoV.[1] The first case in Africa was recorded in Egypt[2] and by January 30, 2020, the World Health Organization (WHO) declared COVID-19 a global public health emergency.[3,2] The pandemic has caused significant morbidity and mortality worldwide.[4]

The psychosocial impact on frontline healthcare workers (HCWs) has been profound, with high rates of anxiety, depression, stress, burnout, and insomnia reported.[5-7] These conditions are more pronounced among frontline HCWs compared to non-frontline counterparts, exacerbated by long work hours, direct patient contact, and lack of psychological support.[8-10] Nurses and nurse aides show poorer mental health outcomes over time, whereas physicians tend to improve, highlighting differential impacts within the healthcare workforce.[7] Reduced working hours, increased physical exercise, and structured psychological support systems are linked to better mental health outcomes, underscoring the need for targeted interventions[11,10] during and beyond the COVID-19 pandemic.[12-13]

Since the onset of the pandemic, frontline HCWs have faced prolonged stress, social isolation, and fear of infecting others.[14] African countries, including Nigeria, have fragile health systems, exacerbated by a severe shortage of healthcare workers.[15-18] The pandemic exposed weaknesses in the surveillance system due to dispersed reporting methods.[19] This raises concerns about Nigeria's ability to cope.[20] The scarcity of health professionals and overburdened facilities has worsened the situation.[21] Work-related stress, lack of PPE, and insufficient healthcare resources contribute to the burden.[22-24]

The pandemic's resurgence has strained Nigeria's healthcare system, highlighting the need to examine its impact on HCWs' mental health and well-being.[25] HCWs managing COVID-19 patients face significant psychological stressors.[26] Factors such as excessive workload, PPE depletion, media attention, lack of specialized medications, insufficient support, social distancing, discrimination, and lack of training contribute to their psychological burden.[27,28] Many Nigerian HCWs assumed frontline roles without adequate training, leading to low resilience and susceptibility to mental health issues.[29]

Notably, most studies on COVID-19's impact on health personnel in isolation centres have been conducted in affluent nations, with limited research from low-middle-income countries.[23,24,30,2,31] Differences in socioeconomic conditions and resources between developed and developing countries highlight the need for studies like this one, which assesses the psychosocial impacts of COVID-19 on frontline HCWs at Ahmadu Bello University Teaching Hospital (ABUTH), a tertiary health care facility in Zaria, Kaduna State, Northwest, Nigeria.

Method

Study Design

This cross-sectional study was carried out at the COVID-19 Isolation Centre of Ahmadu Bello University Teaching Hospital (ABUTH) in Zaria, Kaduna State, Nigeria.

Study Setting

Ahmadu Bello University Teaching Hospital (ABUTH) was originally established as the Institute of Health, ABUTH was relocated in 2005 from Tudun-Wada Zaria to its permanent site in Shika Sabon Gari Local Government Area and was officially commissioned by President Olusegun Obasanjo on November 26, 2005. ABUTH provides advanced healthcare services, including general outpatient care, 24-hour accident and emergency services, and inpatient care.

The initial COVID-19 Treatment Center at ABUTH was built by the Nigerian National Petroleum Corporation (NNPC) for burn injuries. On May 21, 2020, it was repurposed for critically ill COVID-19 patients with NNPC's consent and formally commissioned on May 20, 2020. This initiative was supported by the Sir Emeka Offor Foundation, which donated hospital bed sets valued at 48.5 million Naira to aid in combating the pandemic (ABUTH Commissions COVID-19 Treatment Centre in Zaria, 2020).[32]

Study Population

The study population consisted of 97 frontline HCWs, including doctors, nurses, pharmacists, laboratory scientists, and health information managers working in the COVID-19 centre of ABUTH, who were either recruited (and some specially trained) as the Emergency Response Team. They were made up of both male and female HCWs, of varying years of professional experiences.

Sample and Sampling Technique

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A census sampling (total enumeration), involving all 97 frontline healthcare workers (HCWs: 35 doctors, 52 nurses, 4 pharmacists, 3 laboratory scientists, and 3 health information managers), was adopted at the tertiary healthcare facility to ensure comprehensive data collection on the psychosocial impact of COVID-19.

Instrument for Data Collection

Data were collected using adapted tools from the PTSD Checklist for DSM-5 by Weathers et al.,[33] and Perceived Discrimination Scale by Williams et al.,[34]. The PTSD Checklist for DSM-5 (PCL-5) is widely used self-report measure designed to assess the presence and severity of post-traumatic stress disorder symptoms. It includes 20 items corresponding to the 20 symptoms of PTSD and has been validated through psychometric testing. The tool has high internal consistency and excellent test-retest reliability, and has strong correlations with other measures of PTSD and related constructs[33]. The PCL-5 was adapted for different context or population. While the Perceived Discrimination Scale by Williams et al. on the other hand, measures individuals' perceptions of discriminatory experiences based on race, gender, socioeconomic status, or other personal characteristics. It has been validated in diverse populations and settings, demonstrating good internal consistency and satisfactory construct validity. The tools items were modified to make them more relevant and aligned with the study objectives. The modified questionnaire contained three sections as thus:

Section A: Socio-demographic data (age, religion, education level, marital status, professional status, years of clinical experience, working hours, prior workplace).

Section B: Psychological impact of COVID-19 was measured by the PTSD Checklist for DSM-5 using a four points Likert scale (0 = Not at all, 1 = A little bit, 3 = Moderate, 4 = Quite a bit, 5 = Extremely)[35,36]. The tool categorizes PTSD symptoms into intrusion, avoidance, negative cognition and mood alterations, and heightened arousal and reactivity.

Section C: Social impact was measured by the Perceived Discrimination Scale using a three-point Likert scale (0 = Never, 1 = Rarely, 3 = Sometimes, and 4 = Often).[37,38]

Validity and Reliability of Instruments

Face and content validity were assessed by two experts in the field of public health and mental health nursing. The original tool's reliability Cronbach's alpha coefficient value was 0.70 and above while the overall Cronbach's alpha coefficient of the modified tool for this study was 0.71.

Procedure for Data Collection

Self-administered questionnaires were distributed to all the 97 frontline HCWs. All the participants were briefed on the study's aims, and their consent was obtained. The questionnaires were completed within approximately ten minutes and subsequently collected for analysis. Data collection was conducted over three weeks, targeting the participants during break times.

Method of Data Analysis

Data were edited, coded, and entered into SPSS version 23.0. Descriptive statistics, including frequencies and percentages, were used to summarize the data. The psychological and social impacts of COVID-19 were categorized based on mean scores into three distinct levels: low, moderate, and high. For psychological impact, a mean score between 1.0 and 1.9 was categorized as low stress, 2.0 to 2.9 as moderate stress, and 3.0 to 4.0 as high stress. Equally, for social impact, mean scores between 1.0 and 1.9 indicated low social impact, 2.0 to 2.9 indicated moderate social impact, and 3.0 to 4.0 indicated high social impact. The categorized impact levels were then used as dependent variables in chi-square analyses to assess associations with socio-demographic factors, which served as the independent variables. The Chi-square test assessed associations between predictor and outcome variables with a significance level of $P \leq 0.05$.

Ethical Considerations

Ethical approval was obtained from the Health Research Ethics Committee of Ahmadu Bello University Teaching Hospital (approval number: ABUTHZ/HREC/W48/2022). Participation was voluntary, and confidentiality and anonymity were ensured. Participants could withdraw at any stage without consequences.

Results

Ninety-seven questionnaires were administered, and only eighty-seven were returned and valid for analysis, given a response rate of 89.7%. The demographic characteristics of the respondents in this study (see Table 1) reflect a predominantly male (65.5%) and Muslim (69.0%) frontline healthcare workforce at Ahmadu Bello University Teaching Hospital in Zaria. The age distribution shows a concentration in the 46-55 age range (61.7%), with a mean age of 43.32 years. The Hausa/Fulani ethnic cluster constitutes 43.7% of the respondents, followed by Yoruba (21.8%), reflecting the study population's regional demographic sspread. Majority (n= 72; 82.8%) was married, and out of the

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married professionals, were 59 (67.8%) living together and more than one-third, 34.5 (30%) of the respondents, have 7 and above dependent

Table 1: Socio-demographic Characteristics of the Frontline Healthcare Workers (n=87)

Variables	Frequency	Percentage
Gender		
Male	57	65.5
Female	30	34.5
Age group (Years)		
26 – 30	9	10.3
31 – 35	4	4.6
36 – 40	20	23.6
41 - 45	12	13.8
46 – 50	25	28.7
51 – 55	17	29.5
Age Mean and SD	43.32±1.56	
Tribe		
Hausa/Fulani	38	43.7
Yoruba	19	21.8
Igbo	3	3.4
Others	27	31.0
Religion		
Islam	60	69.0
Christianity	27	30.0
Marital status		
Single	15	17.2
Married	72	82.8
Separated	0	0.0
Divorcee	0	0.0
Widow	0	0.0
Partner living status		
Living together	59	67.8
Living separate	13	14.9
Not applicable	15	17.2
Number of dependents		
1 – 3	28	32.2
4 – 6	29	33.3
7 – 10	30	34.5

The results in Table 2 on educational attainment reveals that the majority of respondents hold a bachelor's degree (39.1%), followed by Higher National Diploma (HND) or equivalent (24.1%), and Master's degrees (14.9%), with no respondents having a PhD. Work experience varies, with most (47.1%) of the respondents having 6-15 years of experience with a mean work experience of 35.06 years. Nurses (48.3%) slightly outnumber doctors (40.2%), with smaller proportions of pharmacists, laboratory scientists, and health information managers. Most respondents work 48-hour calls (72.4%), indicating long and demanding hours, with fewer working 8-hour (13.8%), 16-hour (4.6%), or 24-hour call duty (9.2%). Additionally, more than half of the respondents (56.3%) have received formal training on COVID-19, while a significant minority (43.7%) have not, highlighting a potential gap in preparedness and training.

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Table 2: Educational Background, Work Experience, Cadre Distribution, Shift Hours, and COVID-19 Training Among Frontline Healthcare Workers

Variables	Frequency	Percentage
Highest level of education		
PhD	0	0.0
Fellowship	8	9.2
MSc/Masters	13	14.9
PGD	6	6.9
BSc.	34	39.1
HND/Equivalent	21	24.1
Diploma	5	5.7
Years of work experience		
0 - 5 years	8	9.2
6 - 10 years	20	23.0
11 - 15 years	21	24.1
16 - 20 years	8	9.2
21 - 25 years	18	20.7
26 - 30 years	12	13.8
Year of work experience mean and SD	35.06±1.59	
Cadre		
Doctor	35	40.2
Nurse	42	48.3
Pharmacist	4	4.6
Laboratory scientist	3	3.4
Health information manager	3	3.4
Hours per call		
8 hours	12	13.8
16 hours	4	4.6
24 hours	8	9.2
48 hours	63	72.4
Formal training on COVID-19		
Yes	49	56.3
No	38	43.7

Table 3 presents the psychological impacts among respondents. The prevalence of unwanted memories was generally low, with a mean score of 2.44 ± 1.21, indicating a moderate impact. Repeated dreams of the stressful experience were also reported as having a low impact, with a mean score of 1.53 ± 1.28. Approximately 41.4% of respondents experienced feeling as if the stressful event were happening again, categorized under low impact (1.89 ± 1.13). Physical reactions to memories were predominantly low, with a mean score of 1.15 ± 0.96. Avoidance behaviours related to the stressful experience were categorized as low impact, with 52.9% reporting a mean score of 0.94 ± 0.78. The intense feelings of negative emotions such as fear, anger, or guilt had a mean score of 0.57 ± 0.77, categorizing them as low impact. Loss of interest in previously enjoyed activities was noted as low impact, with 59.8% reporting a mean score of 0.84 ± 1.20. Social detachment was also categorized as low, with a mean score of 2.01 ± 1.05. Concentration difficulties (mean score 0.62 ± 0.98) and trouble sleeping (mean score 1.32 ± 1.12), were generally categorized as low impact

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Table 3: Psychological Impact of COVID-19 among Frontline Healthcare Workers

Statements	Mean ± SD	Impact Category
Unwanted memories of the stressful experience	2.44±1.21	Moderate Impact
Repeated dreams of the stressful experience	1.53±1.28	Low Impact
Feeling as if the stressful experience were happening again	1.89±1.13	Low Impact
Feeling very upset when something reminds you of the stressful experience	2.07±1.28	Moderate Impact
Having a physical reaction when you remember the stressful experience	1.15±0.96	Low Impact
Avoiding memories and thoughts related to the stressful experience	1.69±1.29	Low Impact
Avoiding external reminders of the stressful experience	0.94±0.78	Low Impact
Trouble remembering important aspects of the stressful experience	1.81±1.18	Low Impact
Having strong negative beliefs about self and others	1.31±1.05	Low Impact
Blaming self or someone for the stressful experience	0.66±0.73	Low Impact
Having negative feelings like fear, anger, and guilt	0.57±0.77	Low Impact
Loss of interest in activities that you used to enjoy	0.84±1.20	Low Impact
Feeling distance from people	2.01±1.05	Moderate Impact
Trouble experiencing positive feelings	1.29±1.41	Low Impact
Having irritable behaviors	0.66±1.28	Low Impact
Taking too many risks	0.73±1.10	Low Impact
Being super-alert or watchful	1.98±1.24	Moderate Impact
Feeling frightened or easily startled	1.05±1.14	Low Impact
Having difficulty concentrating	0.62±0.98	Low Impact
Trouble falling or staying asleep	1.32±1.12	Low Impact

Overall mean and SD = 2.44±1.21

Table 4 presents the social impacts of COVID-19 on frontline healthcare workers (HCWs), highlighting experiences of discrimination and negative social interactions. The results indicate that HCWs generally experienced low social impact. Notably, being treated with less courtesy had a mean score of 1.06 ± 1.11, falling within the low impact category. Feeling treated with less respect had a mean score of 2.21 ± 1.06, reported as moderate impact. Poor service at restaurants or stores was also categorized as moderate impact, with a mean score of 2.02 ± 0.79. The perception of people acting as if they were afraid of HCWs was low, with a mean score of 1.01 ± 1.20. Regarding being perceived as dishonest, this was reported as moderate impact, with a mean score of 2.23 ± 0.96.

In terms of feeling undervalued or not as good as others, the mean score was 1.91 ± 0.52, placing it in the low impact category. Experiences of name-calling or insults and harassment were similarly low, with mean scores of 1.89 ± 1.09 and 1.93 ± 0.99, respectively. Discrimination based on professional status had a low impact (mean score 1.70 ± 0.82), and discrimination due to placement at the COVID-19 treatment centre was also low (mean score 1.49 ± 1.08). Gender-based discrimination fell into the moderate impact category with a mean score of 2.17 ± 0.67, as did age discrimination with a mean score of 2.28 ± 0.62. Discrimination at places of worship was moderate (mean score 2.24 ± 0.66), while discrimination due to physical appearance was low (mean score 1.77 ± 1.09). Workplace and home-based discrimination also remained in the low impact category, with mean scores of 1.70 ± 0.82 and 2.01 ± 0.67, respectively. Family and friends' discriminatory behaviours were low (mean scores 2.24 ± 0.86 and 2.11 ± 0.69), and neighbour discrimination was also low, with a mean score of 1.71 ± 0.71.

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Table 4: Social Impact of COVID-19 on Frontline Healthcare Workers

Social Impacts	Mean ± SD	Impact Category
You are treated with less courtesy than other people	1.06±1.11	Low Impact
You are treated with less respect than other people	2.21±1.06	Moderate Impact
You receive poorer service than other people at restaurants or stores	2.02±0.79	Moderate Impact
People act as if they think you are not smart	1.37±0.78	Low Impact
People act as if they are afraid of you	1.01±1.20	Low Impact
People act as if they think you are dishonest	2.23±0.96	Moderate Impact
People act as if they think you are not as good as they are	1.91±0.52	Low Impact
You are called names or insulted	1.89±1.09	Low Impact
You are threatened or harassed	1.93±0.99	Low Impact
Were you discriminated against due to your professional status at work	1.70±0.82	Low Impact
Were you discriminated against due to your placement at the COVID-19 treatment centre	1.49±1.08	Low Impact
Were you discriminated against due to your gender	2.17±0.67	Moderate Impact
Were you discriminated against due to your age	2.28±0.62	Moderate Impact
Were you discriminated against at your place of worship	2.24±0.66	Moderate Impact
Were you discriminated against due to your physical appearance	1.77±1.09	Low Impact
Were you discriminated against due to your workplace	1.70±0.82	Low Impact
Were you discriminated against due to your home	2.01±0.67	Moderate Impact
Did your family members discriminate against you	2.24±0.86	Moderate Impact
Did your friends discriminate against you	2.11±069	Moderate Impact
Did your neighbours discriminate against you	1.71±071	Low Impact

Overall mean and SD = 1.7765± 0.5581

Table 5: Relationship with Socio-demographic Characteristics and Psychological Impact (n= 87)

Socio-demographic Characteristics	Low Impact	Moderate Impact	χ^2	df	P-value
Gender			58.419	16	0.000**
Male	45 (51.7%)	12 (13.8%)			
Female	20 (23.0%)	10 (11.5%)			
Age			376.2	80	0.000**
26 – 30	5 (5.7%)	4 (4.6%)			
31 – 35	2 (2.3%)	2 (2.3%)			
36 – 40	12 (13.8%)	8 (9.2%)			
41 – 45	7 (8.0%)	5 (5.7%)			
46 – 50	15 (17.2%)	10 (11.5%)			
51 – 55	10 (11.5%)	7 (8.0%)			
Work experience			338.6	80	0.000**
0 - 5 years	5 (5.7%)	3 (3.4%)			
6 - 10 years	12 (13.8%)	8 (9.2%)			
11 - 15 years	13 (14.9%)	8 (9.2%)			
16 - 20 years	5 (5.7%)	3 (3.4%)			
21 - 25 years	12 (13.8%)	6 (6.9%)			
26 - 30 years	7 (8.0%)	5 (5.7%)			
Cadre			159.7	64	0.000**
Doctor	25 (28.7%)	10 (11.5%)			
Nurse	30 (34.5%)	12 (13.8%)			

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Socio-demographic Characteristics	Low Impact	Moderate Impact	χ^2	df	P-value
Pharmacist	3 (3.4%)	1 (1.1%)			
Laboratory scientist	2 (2.3%)	1 (1.1%)			
Health information manager	2 (2.3%)	1 (1.1%)			
Highest educational level			322.2	80	0.000**
Fellowship	5 (5.7%)	3 (3.4%)			
MSc/Masters	8 (9.2%)	5 (5.7%)			
PGD	4 (4.6%)	2 (2.3%)			
BSc	20 (23.0%)	14 (16.1%)			
HND/Equivalent	12 (13.8%)	9 (10.3%)			
Diploma	3 (3.4%)	2 (2.3%)			
Formal training Yes No	 29 (33.3%) 20 (23.0%)	 28 (32.2%) 10 (11.5%)	69.111	16	0.000**
Tribe			158.3	48	0.000**
Hausa/Fulani	25 (28.7%)	13 (14.9%)			
Yoruba	10 (11.5%)	9 (10.3%)			
Igbo	2 (2.3%)	1 (1.1%)			
Others	15 (17.2%)	12 (13.8%)			
Religion			37.124	16	0.002**
Islam	40 (46.0%)	20 (23.0%)			
Christianity	25 (28.7%)	2 (2.3%)			
Number of dependents			147.6	32	0.000**
1 - 3	20 (23.0%)	8 (9.2%)			
4 - 6	18 (20.7%)	11 (12.6%)			
7 - 10	15 (17.2%)	15 (17.2%)			
Hours per call			207.1	48	0.000**
8 hours	8 (9.2%)	4 (4.6%)			
16 hours	3 (3.4%)	1 (1.1%)			
24 hours	5 (5.7%)	3 (3.4%)			
48 hours	40 (46.0%)	23 (26.4%)			

Table 6: Relationship between the Social Impacts of COVID-19 and Characteristics of Frontline Healthcare Workers

Socio-demographic Characteristics	Low Impact	Moderate Impact	χ^2	df	P-value
Gender			39.805	18	0.002**
Male	28 (32.2%)	12 (13.8%)			
Female	12 (13.8%)	5 (5.7%)			
Age			246.0	90	0.000**
26 – 30	6 (6.9%)	3 (3.4%)			
31 – 35	3 (3.4%)	1 (1.1%)			
36 – 40	13 (14.9%)	7 (8.0%)			
41 – 45	8 (9.2%)	4 (4.6%)			
46 – 50	16 (18.4%)	9 (10.3%)			

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Socio-demographic Characteristics	Low Impact	Moderate Impact	χ^2	df	P-value
51 – 55	10 (11.5%)	7 (8.0%)			
Work experience			196.3	90	0.000**
0 - 5 years	6 (6.9%)	2 (2.3%)			
6 - 10 years	12 (13.8%)	8 (9.2%)			
11 - 15 years	14 (16.1%)	7 (8.0%)			
16 - 20 years	5 (5.7%)	3 (3.4%)			
21 - 25 years	11 (12.6%)	7 (8.0%)			
26 - 30 years	7 (8.0%)	5 (5.7%)			
Cadre			104.3	72	0.007**
Doctor	25 (28.7%)	10 (11.5%)			
Nurse	31 (35.6%)	11 (12.6%)			
Pharmacist	3 (3.4%)	1 (1.1%)			
Laboratory scientist	2 (2.3%)	1 (1.1%)			
Health information manager	2 (2.3%)	1 (1.1%)			
Highest educational level			199.9	90	0.000**
Fellowship	5 (5.7%)	3 (3.4%)			
MSc/Masters	8 (9.2%)	5 (5.7%)			
PGD	4 (4.6%)	2 (2.3%)			
BSc	20 (23.0%)	14 (16.1%)			
HND/Equivalent	12 (13.8%)	8 (9.2%)			
Diploma	3 (3.4%)	2 (2.3%)			
Formal training			51.682	16	0.000**
Yes	37 (42.5%)	26 (29.9%)			
No	12 (13.8%)	12 (13.8%)			
Tribe			111.1	54	0.000**
Hausa/Fulani	26 (29.9%)	12 (13.8%)			
Yoruba	9 (10.3%)	10 (11.5%)			
Igbo	2 (2.3%)	1 (1.1%)			
Others	16 (18.4%)	11 (12.6%)			
Religion			30.605	18	0.032**
Islam	45 (51.7%)	15 (17.2%)			
Christianity	23 (26.4%)	4 (4.6%)			
Number of dependents			113.9	36	0.000**
1 - 3	19 (21.8%)	9 (10.3%)			
4 - 6	17 (19.5%)	12 (13.8%)			
7 - 10	14 (16.1%)	16 (18.4%)			
Hours per call			89.607	54	0.002**
8 hours	8 (9.2%)	4 (4.6%)			
16 hours	3 (3.4%)	1 (1.1%)			
24 hours	5 (5.7%)	3 (3.4%)			
48 hours	40 (46.0%)	18 (20.7%)			

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Relationship between the Psychological Impacts of COVID-19 and the Characteristics of Frontline HCWs

Table 5 and 6 presents statistically significant correlations between the classified psychological effects of COVID-19 on FHCWs and different demographic and professional traits, as examined by Chi-square tests. Statistically significant correlations were found between psychological impact and gender ($\chi^2 = 58.419$, $p < 0.001$), suggesting that the degree of psychological distress differed greatly between male and female FHCWs. Furthermore, age was a notable determinant ($\chi^2 = 376.2$, $p < 0.001$), indicating that distinct age cohorts encountered diverse degrees of psychological strain. Work experience ($\chi^2 = 338.6$, $p < 0.001$) and professional cadre ($\chi^2 = 159.7$, $p < 0.001$) were strongly associated with psychological impact, highlighting that more experienced HCWs or those in specific roles might face distinct stress levels. Educational background showed a significant association as well ($\chi^2 = 322.2$, $p < 0.001$), implying that the level of education influenced psychological responses to the pandemic.

Formal training prior to placement at the COVID-19 centre was another significant factor ($\chi^2 = 69.111$, $p < 0.001$), emphasizing the role of preparedness in mitigating psychological impact. Cultural factors such as tribe ($\chi^2 = 158.3$, $p < 0.001$) and religion ($\chi^2 = 37.124$, $p = 0.002$) were also significantly associated, suggesting that cultural and religious contexts played a role in how HCWs perceived and coped with stress. Personal factors, including the number of dependents ($\chi^2 = 147.6$, $p < 0.001$), were significantly linked to psychological impact, reflecting the added pressures of family responsibilities. Additionally, work-related factors such as hours per call ($\chi^2 = 207.1$, $p < 0.001$) showed a significant association, indicating that longer working hours were related to increased psychological distress (see Table 5).

Relationship between the Social Impacts of COVID-19 and Characteristics of Frontline Healthcare Workers

Table 6 show illustrate findings of significant correlations between social impact and gender ($\chi^2 = 39.805$, $p = 0.002$), suggesting that male and female HCWs faced varying degrees of social impact throughout the epidemic. Age was also substantially linked with social impact ($\chi^2 = 246.0$, $p < 0.001$). Work experience ($\chi^2 = 196.3$, $p < 0.001$) and professional cadre ($\chi^2 = 104.3$, $p = 0.007$) were significant variables. Educational attainment also had a role ($\chi^2 = 199.9$, $p < 0.001$), with HCWs' greatest educational levels influencing the degree of social impact faced.

Formal training before placement at the COVID-19 facility was substantially associated to social impact ($\chi^2 = 51.682$, $p < 0.001$). In addition, tribe ($\chi^2 = 111.1$, $p < 0.001$), religion ($\chi^2 = 30.605$, $p = 0.032$), were also associated with social impact and the number of dependents ($\chi^2 = 113.9$, $p < 0.001$), revealed a significant correlation, demonstrating that family duties affected the societal effect of the pandemic. Additionally, work-related characteristics such as hours per call ($\chi^2 = 89.607$, $p = 0.002$) were strongly connected to social effect, showing that HCWs with longer working hours encountered larger social issues (see Table 6).

Discussion

The socio-demographic analysis revealed that more than two-thirds of the respondents were male, and most were in their early 40s. Nearly half of the respondents had between 6 and 15 years of work experience, and almost half were nurses by cadre. Notably, 72% of the respondents spent 48 hours on each call duty at the COVID-19 centre, and 44% had no formal training on COVID-19 before their posting. These findings align with those of Mfuh and Yahaya[39], who reported that most respondents were under 40 years old and within their productive ages, contributing significantly to active healthcare during the pandemic. Similarly, Mfuh and Yahaya[39] found that about two-thirds of the healthcare providers were male, and more than half were between 31 to 40 years old.

The study revealed that the overall psychological impact of COVID-19 on frontline HCWs was moderately low, with more than one-third (39%) experiencing a moderate psychological impact. This contrasts with findings by Crowe et al.[40], who reported significant psychological effects among critical care nurses. Similarly, Lai et al.[41] found prevalent symptoms of sadness, anxiety, insomnia, and distress among healthcare personnel during the pandemic. Factors linked to psychological impact in our study included feeling distant from others, strong negative beliefs about oneself and others, trouble sleeping, difficulty remembering key details, and unwanted memories of the stressful experience. Crowe et al.[40] identified anxiety, concern, distress, and dread as significant psychological factors.

More than half (55%) of the respondents were often Socially impacted by COVID-19, with many reporting that people acted as if they were afraid of them. Additionally, over two-third of the HCWs felt that others thought they were not wise. This perception

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could impact on the social status of HCWs. Bhanot et al.[42], had reported that stigma and anxiety surrounding communicable diseases ccould limit response efforts. The COVID-19 outbreak led to many variants of social stigma and discriminatory actions against those perceived to have been in contact with the patients with the virus. For example, HCWs were accorded less respect than other people, and poorly attended to public places including restaurants and even worship arenas. HCWs were thus stigmatized.

The findings also revealed significant relationships between psychosocial impact and gender, age, work experience, cadre, highest educational level, formal training before placement at the COVID-19 centre, tribe, religion, number of dependents, and hours per call. These results highlight those factors such as gender, age, professional role, educational background, prior training, cultural background, religious beliefs, personal responsibilities, and work demands significantly influenced the psychological distress experienced by HCWs during the pandemic. These findings align with study by Crowe et al.,[40] where they reported significant psychological impacts on critical care nurses during the early stages of the pandemic, including anxiety and distress. Similarly, Lai et al.,[41] found prevalent symptoms of sadness, anxiety, insomnia, and distress among healthcare personnel. The significant associations between psychological impacts and factors like gender, age, and work experience are consistent with research by Kisely et al.,[43] who found that female gender, younger age, and less work experience were associated with higher psychological distress among HCWs. The findings on social impacts of COVID-19, was supported by Smith et al.[44] who emphasized that HCWs with more years of experience and higher educational levels faced greater social challenges due to their professional responsibilities. The significant relationship between formal training and social impact supports findings by Shanafelt et al.,[45] who noted that adequate training and preparation were crucial in reducing the psychosocial burdens on HCWs during the pandemic. Additionally, the impact of cultural and religious backgrounds aligns with the findings of Abu-Raya,[46] who reported that cultural and religious factors significantly influenced the experiences of HCWs during the pandemic.

Implications of the Study

The study highlights the need for robust mental health support systems, counselling, stress management programs, and peer support networks to mitigate burnout and promote a healthier work environment, emphasizing the importance of regular assessments, flexible work schedules, and fair compensation.

Strengths and Limitations of the Study

Strengths of the Study

1. The study encompasses a diverse array of socio-demographic, educational, and professional attributes, providing a thorough insight into the effects of COVID-19 on frontline healthcare workers (FHCWs).
2. The study encompassed both psychological and social effects, highlighting the complex obstacles encountered by FHCWs throughout the pandemic.
3. The inclusion of numerous tribes, educational levels, and professional categories guarantees representation from diverse cultural and professional backgrounds.

Limitation of the Study

The study was unable to do a longitudinal study to ascertain the long-term effects of COVID-19 on frontline healthcare workers (FHCWs) and hence recommends more investigation in this domain to gain insights into the changes during the pandemic.

Conclusion

Most frontline healthcare workers (HCWs) in this setting exhibited resilience during the COVID-19 pandemic, experiencing minimal psychosocial impacts. However, significant associations were found between reported impacts and factors such as gender, age, work experience, cadre, education level, training, tribe, religion, number of dependents, and hours per call. Less experienced HCWs, along with gender differences, indicated varying levels of stress and coping mechanisms. Higher education and formal training correlated with reduced psychosocial impacts, while cultural, religious backgrounds, and personal responsibilities also played roles. Long work hours were a critical stressor. These findings underscore the need for multifaceted support programs, including training, mental health resources, and flexible work arrangements to address the diverse factors affecting HCWs' well-being.

Recommendations

Based on the study findings, several to enhance the well-being of frontline healthcare workers (HCWs) during the COVID-19 pandemic, there is the need to:

1. Implement comprehensive training programs both before and during deployment to COVID-19 treatment and isolation centres. These programs should focus on preparing HCWs for the challenges they may encounter, thereby reducing psychological impacts.
2. Establish robust mental health support systems, including counselling and stress management programs,

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specifically tailored to address the diverse psychological impacts associated with demographic and professional factors among HCWs.
3. Recognize and reward the dedication and efforts of HCWs through incentives and acknowledgments. Such recognition not only boosts morale but also provides essential emotional support.
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Declarations

Ethical Consideration: Ethical approval was obtained from the Health Research Ethics Committee of Ahmadu Bello University Teaching Hospital (approval number: ABUTHZ/HREC/W48/2022). Participation was voluntary, and confidentiality and anonymity were ensured. Participants could withdraw at any stage without consequences.

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