



PSYCHOLOGICAL IMPACT OF COVID-19 SURGE AMONG HEALTHCARE WORKERS IN PRIMARY, SECONDARY AND TERTIARY CARE SETTINGS IN CROSS RIVER STATE, NIGERIA

Paulina Ackley Akpan-Idiok and Emmanuel Chukwunwike Enebeli*

Department of Nursing Science, Faculty of Allied Medical Sciences, College of Medicine, University of Calabar, Cross River State, Nigeria.

*Correspondence Email: emmanuelenebeli001@gmail.com

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ABSTRACT: *Introduction:* This study investigates the psychological impact of COVID-19 surge and the community spread among healthcare workers (HCWs) in the three tiers of health care delivery system in CRS. **Materials and Methods:** Descriptive cross-sectional design was adopted for this study. Total population sampling technique guided the recruitment of 776 consenting healthcare workers from one tertiary, one secondary and three randomly selected primary healthcare centres in the state. A well validated researcher developed, adapted and modified 21-item Depression, Anxiety and Stress Scale (DASS-21) online questionnaire with a Cronbach's alpha coefficient reliability of 0.76, used for data collection. **Result:** Majority of the respondents were nurses 460 (63.3%) and the mean age was 37.3. The incidence of depression, anxiety, stress and overall psychological problems were 288 (37.1%), 375 (48.3%) 316 (40.7%) and 402 (51.8%). The overall psychological problems were higher in females 331 (58.0%) than in males 71 (34.6%) (PR=1.67). Compared with HCWs who do not have personal contact with patients, HCWs who have personal contact with patients had a higher prevalence of psychological problems (PR=1.83). **Conclusion:** COVID-19 pandemic has negative psychological impacts on HCWs, and having a pre-existing medical condition increases the risk of impact. **Word count: 194 words**

KEYWORDS: COVID-19, Psychological impact, Healthcare workers.



INTRODUCTION

The world is currently at war, a war which is not physical but biological, a war against a virus which cannot be seen or heard, a virus who is no respecter of ethnicity, colour or race, a virus so minute that it measures in micrometre but yet so powerful that it has brought world powers to their knees, a virus that placed almost the entire world on a lockdown for month(s), a virus code named SARS-CoV-2. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the virus responsible for the coronavirus disease (COVID-19) which was declared a pandemic by the World Health Organisation (WHO) on March 11, 2020 after noting it to have affected 114 countries (Cucinotta & Vanelli, 2020).

Nigeria recorded her first confirmed case of COVID-19 on February 27, 2020 in Lagos, Nigeria. The case was an Italian citizen who worked in Nigeria and returned from Milan, Italy to Lagos, Nigeria on February 25, 2020 (Nigeria Centre for Disease Control [NCDC], 2020a). On March 9, the second case was confirmed, who was a Nigerian citizen who had contact with the index case (Erunke, 2020). The first coronavirus death in Nigeria was recorded on March 23, 2020 (Nigeria reports first coronavirus death, 2020), and as of March 30, 2020 the second death was recorded and the confirmed case had already increased to 111 (Nigeria records second death from coronavirus, 2020). The number of confirmed cases in Nigeria rose above 10,000 cases on June 1, 2020 and as of July 12, 2020, the total number of confirmed cases were 32,558 and 740 fatalities (NCDC, 2020b), with 95% of the cases being mild and several cases having no symptoms (NCDC, 2020c). Depending on the severity of the symptom, a COVID-19 patient may require hospitalisation and be managed by healthcare professionals (NCDC, 2020c; WHO, 2020).

Healthcare workers are the frontline soldiers in this biological warfare against the invisible SARS-CoV-2. Healthcare workers in the frontline do not just mean nurses and physicians, or only those directly involved in the treatment of a patient, but rather it comprises those directly and indirectly involved in the day-to-day management of a patient. Healthcare workers at the frontline may include all staff under the employment of a hospital and this includes but not limited to Physicians, Nurses, Midwives, Radiographers, Physiotherapists, Optometrists, Pharmacist, Laboratory Scientists, Primary Healthcare Workers. These healthcare workers have their different roles and are key players in the response to COVID-19 pandemic.

Because of the roles they play during the on-going COVID-19 pandemic, healthcare workers are at a higher risk of contracting the infection as they are prone to exposure to cases (both confirmed and those yet to be confirmed). In China, 1,716 health officials had tested positive as of February 14, 2020 (Winsor & Schumacher, 2020); in Italy the prevalence of infection among healthcare workers (HCWs) exceeds 10% (Felice, Di Tanna, Zanus, & Grossi, 2020). In the United State of America, between February 12–April 9, among 315,531 COVID-19 cases reported to Center Of Disease Control Prevention (CDC) using a standardized form, 49,370 included data on whether the patient was a healthcare workers of which 9,282 (19%) identified as healthcare workers (CDC, 2020). In Nigeria, as of May 1, 2020, 113 people comprising about 6% of the confirmed cases were healthcare workers (Abu-bashal, 2020). By June 2, 2020, over 812 healthcare workers had tested positive (Adejoro, 2020).

Despite being at higher risk, by their professional obligation, healthcare workers must be at their workplaces even if their health is at risk, this has an impact on them. A study on factors associated with mental health outcomes among healthcare workers exposed to COVID-19



revealed that there were high rates of depression (50%), anxiety (45%), insomnia (34%), and distress (72%) (Lai, et al., 2020). In a study conducted by Tan et al. (2020) on the psychological impact of the COVID-19 pandemic on health care workers in Singapore, about 14.5% of individuals screened tested positive for anxiety, 8.9% for depression, 6.6% for stress, and 7.7% for concern for Posttraumatic Stress Disorder (PTSD).

Studies show that this pandemic has an impact on healthcare workers across the globe and in Nigeria. Cross River state was thought to be free of the virus as it previously had not recorded any case, however, this belief was refuted as it recorded its first case on the 26th of June, 2020 (NCDC, 2020b). This new development has caused panic among the residents of the state and healthcare workers in the state. Hence, this study investigates the impact of COVID-19 on healthcare workers in three-tier care facilities in Cross Rivers State, Nigeria.

Objectives

The objective of this study is to investigate the psychological impact of COVID-19 on healthcare workers.

METHODOLOGY

Study Design

A cross-sectional descriptive design was adopted for this study; a cross-sectional study is a type of observational study that analyses data from a population, or a representative subset, at a specific point in time.

Study Setting and Scope

The study was carried out on healthcare workers (nurses, physicians, medical laboratory scientists and primary health care workers) working in one tertiary, one secondary and three primary health care facilities in Cross River State (CRS). The study was carried out between July, 2020 – Dec 2020.

Sampling Technique

A convenient sampling technique was used to select respondents for this study, where healthcare workers who have access to the internet were contacted through their hospital official WhatsApp groups to complete the study questionnaire online.

Instrument for Data Collection

A structured questionnaire which included the Depression, Anxiety and Stress Scale - 21 items (DASS-21) (Osman et al., 2012) constructed by the researchers using Google form was utilized for this study.

Validity and Reliability of the Instrument

The researcher established the face and content validity of the research instrument. In order to achieve this, the researchers constructed the instrument reflecting the variables under



investigation. In addition, the item in the instrument were based on the specific objectives and literatures reviewed.

A pilot study to test the feasibility and reliability of the instrument was conducted, where twenty healthcare workers working in University of Uyo Teaching Hospital, Uyo were sent the link of the questionnaire to fill online, thereafter it was analysed and the Cronbach coefficient was calculated with a resulting coefficient of 0.76.

Procedure for Data Collection

Data was collected using Google forms which is an online platform for the collection and organisation of information. An introductory message on the aims and importance of the research was sent to respondents using the official WhatsApp group of the various hospitals/professions, a link to the online form accompanied the introductory message. Respondents were required to complete the questionnaire in their spare time.

DATA ANALYSIS

Data was analysed using SPSS version 25 for windows and presented using descriptive statistics of simple percentages, graphs and tables.

Limitations

The limitations to the methodology of this study are as follows:

- Healthcare workers without access to the internet were unable to partake in the study; and
- The use of online questionnaires makes random sampling impossible.

RESULTS

The socio-demographic data of the respondents as shown in Table 1 show that majority of the respondents are females 423 (55.5%), while 353 (45.5%) are male. 291 (37.5 %) respondents are within the age range of 21-30, 318 (41.0%) are within age 31-40, 78 (10.0%) within 41-50 and 89 (11.5%) are 51 – 60 years of age. Most of the respondents, about 491 (63.3%), are nurses, 233 (30.0%) are physicians, 28 (3.6%) are laboratory technologists and 24 (3.1%) are primary health care workers. A vast number of the respondents do not have a pre-existing medical condition; 88 (11.3%) respondents have diabetes, 63 (8.5%) respondents have asthma. Majority of the respondents (62.6%) had 1-7 years of experience, 122 (15.7%) had 8-14 years of experience while only 65 (8.4%) had 29-35 years of experience.

Table 2 shows the incidences of anxiety, depression, insomnia and the overall psychological problems in healthcare workers. For depression, 37.1% of the healthcare workers screened positive for depression, including 29.1% with mild depression, 5.2% with moderate and 2.6% with severe depression. The highest incidence of depressive symptoms was observed in nurses (38.5%), the lowest incidence of depression symptoms was observed in physicians (34.3%). Anxiety had the highest incidence when compare to other psychological problems, 48.3% of



the healthcare workers screened positive for anxiety, with 32.7% mild cases, 10.6% moderate and 5.0% cases of severe anxiety. The highest incidence of anxiety symptoms was observed in medical lab technologists (53.6%), while the lowest incidence of depressive symptoms was observed in primary health care workers (41.7%). 59.3% of the respondents had normal stress levels, while 40.7% of the healthcare workers screened positive for depression, including 30.3% with mild symptoms of stress, 6.4% with moderate symptoms of stress and 4.0% with severe symptoms of stress. On the overall psychology, 48.2% of the healthcare workers had a normal overall psychological and 51.8% of the healthcare workers had an overall psychological problem.

The prevalence of all psychological symptoms was higher in females than in males (see Table 3), however most notable was the overall psychological problem (58.0 versus 34.6, PR = 1.67 [95% CI, 0.95 – 2.18]). Individuals with existing medical condition compared to those without had a higher prevalence of anxiety (63.6 versus 42.3, PR = 1.51 [95% CI, 0.83 – 1.99]) and overall psychological problem (76.8 versus 41.9 PR = 1.69 [95% CI, 1.02 – 2.59]).

DISCUSSION

The overall psychological health problem (a positive screen in one or more of the either depression, anxiety or stress) experienced by health care workers due to the outbreak of the COVID-19 pandemic was high indicating that the coronavirus pandemic had an impact on many healthcare workers. However, the incidence of the different psychological symptoms was not high showing a mild impact. That is, while the COVID-19 pandemic had an impact on many healthcare workers, this impact was majorly mild. This is in contrast to the findings by several studies in Italy and China (Felice et al., 2020; Lai et al., 2020; Li, et al., 2020; Que et al., 2020). This can be explained by the fact the number of confirmed cases in Nigeria was not as high as those in these countries. Also the disease originated in China and at one point Italy was the worst hit country by the pandemic.

This study also analysed the incidence of anxiety, depression, stress and overall psychological problems in the different health care workers. Findings show that the incidence of depression, stress and psychological problems were higher among nurses; this correlates with studies by Que et al. (2020) and Li et al. (2020). It can easily be interpreted that nurses have direct round the clock contact with patients having varying disease conditions, hence are at a higher risk of contracting COVID-19. Also as a measure to prevent further spread and contain the disease, nurses may be placed on isolation and separated from members of their family leading them to worry about them; it has been shown that worrying about family members may be one of the main sources of stress in nurses, indicating the critical role of community support for nurses' mental health (Mo et al., 2020). Furthermore, the nursing profession is dominated by the female gender, who are more susceptible to mental problems (Que, et al., 2020). This was also reported in this study where prevalence of all psychological symptoms was higher in females than in males, however most notable was the overall psychological problem (58.0 versus 34.6, PR = 1.67 [95% CI, 0.95 – 2.18]).

Individuals with existing medical condition compared to those without had a higher prevalence of anxiety (63.6 versus 42.3, PR = 1.51 [95% CI, 0.83 – 1.99]) and overall psychological problem (76.8 versus 41.9 PR= 1.69 [95% CI, 1.02 – 2.59]). This is as a result of the fact that



having these medical conditions places an individual at an increased risk of severe COVID-19 (Cennima, 2020). So the healthcare workers with these conditions are both at a high risk of contracting COVID-19 and also an increased risk of the disease being severe if contracted, hence the higher prevalence of anxiety and overall psychological problem among this category of individuals.

CONCLUSION

The number of healthcare professionals that COVID-19 pandemic had a psychological impact on was high, however the intensity of this impact was mild. The incidents of psychological problems were higher among nurses, and female healthcare workers had a higher prevalence of psychological problems when compared to male healthcare workers. Protective equipment was not readily available and this contributed to the high number of healthcare workers with psychological problems.

RECOMMENDATIONS

- Government and hospital management should provide healthcare workers with adequate protective equipment.
- Hospital management should provide counselling and psychological support for healthcare workers especially during times of disease outbreak.

Conflict of Interest

All authors declare no conflict of interest.

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The authors did not receive any form of funding for this study

Ethical Approval

Prior to data collection, the research protocol was submitted to the Health Research Ethics Committee, University of Calabar Teaching Hospital and was approved (UCTH/HREC/33/86).

List of Abbreviations

CDC:	Center Of Disease Control Prevention
CoV:	Coronaviruses
COVID-19:	Coronavirus disease 2019
CRS	Cross River State
DASS-21:	Depression, Anxiety and Stress Scale - 21 Items
HCWs	Healthcare workers



MERS:	Middle East respiratory syndrome
MERS-CoV:	Middle East respiratory syndrome coronavirus
NCDC :	Nigeria Centre for Disease Control
OSHA:	Occupational Safety and Health Administration
SARS:	Severe Acute Respiratory Syndrome
SARS-CoV:	Severe acute respiratory syndrome coronavirus
SARS-CoV-2:	Severe acute respiratory syndrome coronavirus 2
UCTH:	University of Calabar Teaching Hospital
UNICAL:	University of Calabar
WHO:	World Health Organisation

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APPENDIX

TABLES

Table 1: Socio-demographic data of healthcare workers

Item	Frequency	Percentage
GENDER		
Male	205	26.4
Female	571	73.6
AGE(in years)		
21-30	291	37.5
31-40	318	41.0
41-50	78	10.0
51-60	89	11.5
MARITAL STATUS		
Single	314	40.5
Married	445	57.3
Separated	11	1.4
Divorced	6	0.8
PROFESSION		
Nurse	491	63.3
Physician	233	30.0
Laboratory Technologist	28	3.6
Primary Health Care Worker	24	3.1
YEARS of EXPERIENCE		
1-7	486	62.6
8-14	122	15.7
15-21	60	7.8
22-28	43	5.5
29-35	65	8.4
PRE-EXISTING CONDITION		
None	556	71.6
Diabetes	88	11.3
Asthma	63	8.5
Hypertension	54	7.1
Ischemic Heart Disease	15	1.5
TOTAL	776	100



Table 2: Incidence of Psychological symptoms among healthcare workers

	Depression				Anxiety				Stress				Overall Psychological Problem			
	N (%)	Mi (%)	Mo (%)	S (%)	N (%)	Mi (%)	Mo (%)	S (%)	N (%)	Mi (%)	Mo (%)	S (%)	N (%)	Mi (%)	Mo (%)	S (%)
Healthcare workers (n=776)	488 (62.9)	226 (29.1)	42 (5.4)	20 (2.6)	401 (51.7)	254 (32.7)	82 (10.6)	39 (5.0)	460 (59.3)	235 (30.3)	50 (6.4)	31 (4.0)	374 (48.2)	208 (26.8)	147 (18.9)	47 (6.1)
Nurses (n=491)	302 (61.5)	149 (30.3)	26 (5.3)	14 (2.9)	252 (51.3)	162 (33.0)	51 (10.4)	26 (5.3)	289 (58.9)	150 (30.5)	33 (6.7)	19 (3.9)	229 (46.6)	134 (27.3)	99 (20.2)	29 (5.9)
Physician (n=233)	153 (65.7)	63 (27.0)	11 (4.7)	6 (2.6)	122 (53.4)	77 (33.0)	23 (9.9)	11 (4.7)	137 (58.8)	73 (31.3)	12 (5.2)	11 (4.7)	118 (50.6)	61 (26.2)	39 (16.7)	15 (6.4)
Medical Technologist (n=28)	18 (64.3)	6 (21.4)	4 (14.3)	0 (0.0)	13 (46.4)	9 (32.1)	5 (17.9)	1 (3.6)	20 (71.4)	4 (14.3)	4 (14.3)	0 (0.0)	15 (53.6)	6 (21.4)	5 (17.9)	2 (7.1)
Primary Healthcare workers (n=24)	15 (62.5)	8 (33.3)	1 (4.2)	0 (0.0)	14 (58.3)	6 (25.0)	3 (12.5)	1 (4.2)	14 (58.3)	8 (33.3)	1 (4.2)	1 (4.2)	12 (50.0)	7 (29.2)	4 (16.7)	1 (4.2)

N= Normal Mi= Mild Mo= Moderate S= Severe Es= Extremely Severe

Depression	Anxiety	Stress	Overall Psychological Problem
N= 0-9	N= 0-7	N= 0-14	N= met criteria for N in all
Mi=10-13	Mi=8-9	Mi= 15-18	Mi= met criteria for Mi in all or 2 and N in the rest, met criteria for 1 Mo and N in the rest
Mo=14-20	Mo= 10-14	Mo= 19-25	Mo= met criteria for Mo in all or Mo in 2 and N in 1, met criteria for S in 1 and N/Mi in all
S=24-27	S=15-19	S= 26-33	S= met criteria for S in more than one, met criteria for S in one and Mo in the rest
Es= 28-42	Es=20-42	Es=34-42	

Cut off scores > N indicate a positive screen

**Table 3: Prevalence of depression, anxiety, stress and overall psychological problem based on gender**

Gender	Female (n=423)	Male (n=353)	Prevalence Ratio (95% CI)
<i>Prevalence n(%)</i>			
Depression	220 (38.5)	68 (33.2)	1.16 (0.96 – 1.49)
Anxiety	278 (48.7)	97 (47.3)	1.03 (0.89 – 1.31)
Stress	246 (43.0)	70 (34.1)	1.26 (0.90 – 1.59)
Overall Psychological Problem	331 (58.0)	71 (34.6)	1.67 (0.95 – 2.18)

Existing Medical Condition	Yes (n=220)	No (n=556)	Prevalence Ratio (95% CI)
<i>Prevalence n(%)</i>			
Depression	85 (38.6)	203 (36.5)	1.06 (0.98 – 1.25)
Anxiety	140 (63.6)	235 (42.3)	1.51 (0.83 – 1.99)
Stress	91 (41.3)	225 (40.5)	1.02 (0.75 – 1.41)
Overall Psychological Problem	169 (76.8)	233 (41.9)	1.83 (1.02 – 2.59)

Positive screen in psychological symptoms