



COVID-19 PANDEMIC CHALLENGES, COPING STRATEGIES AND RESILIENCE AMONG HEALTHCARE WORKERS: A MULTIPLE LINEAR REGRESSION ANALYSIS

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ABSTRACT: *The Coronavirus Disease pandemic has affected over 200 countries, including Nigeria; and its psychological impacts demands on HCWs are among crucial considerations owing to the fact that occurrence of acute stress needs adaptive response to meet those demands. However, critical studies on the interrelatedness and importance of challenges, coping strategies and resilience during the pandemic are lacking. **Objective:** To investigate Covid-19 pandemic challenges, coping strategies and resilience among healthcare workers using multiple linear regression analysis. **Method:** This was a descriptive cross-sectional survey among health workers in a State in Northern Nigeria. Data collection was executed through the use of google form software. One hundred and forty-three health care workers constituted the sample. Questionnaires were used for data collection. A combination of consecutive and convenient sampling methods were used. Data analysis was by Statistical Product and Service Solutions (SPSS) version 25. **Findings:** Most of the respondents (89.5%) were having very high challenges. Most of the coping strategies of the respondents centered at low to moderate level (35.7% and 37.1%) respectively; and majority (27.3%) had very low resilience. The correlation between Covid-19 challenges (predictor variable 1) and Covid-19 resilience (outcome variable) was 0.119. The correlation between the Covid-19 coping strategy (predictor variable 2) and Covid-19 resilience (outcome variable) was 0.181. Moreover, the correlation between the predictor variables themselves is 0.301. The result indicated that the model was not a significant predictor of HCWs resilience. The model shows that $F(2, 140) = 2.71$, $P = 0.07$. R was 0.19, and R^2 was 0.037. There was no statistical significant contribution to the prediction of HCWs resilience from the individual predictors. For challenges of Covid-19 variable ($B = 0.080$, $P = 0.413$) and for coping strategies of Covid-19 variable ($B = 0.235$, $P = 0.069$). **Conclusion:** Healthcare workers had low coping strategies and low resilience. There was a weak correlation between the Covid-19 challenges and Covid-19 coping strategies with resilience of healthcare workers; and there was no statistical significant correlation between the independent variables (healthcare workers Covid-19 challenges and healthcare workers Covid-19 coping strategies) and dependent variable (resilience of healthcare workers). **Recommendations:** The policy makers and hospitals management should provide adequate protection equipment, psychological and social support as well as counseling against Covid-19 and other infectious diseases to healthcare workers.*

KEYWORDS: Challenges, Coping, COVID-19, Multiple Linear Regression, Resilience.



INTRODUCTION

The year 2020 brought a strange challenge to human endeavor, the Corona Virus Disease 2019 (Covid-19) (Munawar & Choudhry, 2020). It originated from Wuhan China, spread and became a global health issue (Liu et al., 2020; Wang et al., 2020a). The World Health Organisation (WHO) responded to this serious outbreak by declaring a public health emergency of international concern on January 30, 2020 and called for collaborative efforts of all countries to prevent its rapid spread (WHO, 2020). The first confirmed case of Covid-19 in Nigeria was announced on February 27th, 2020 by the Nigerian government (Kalu, 2020). Since then, the number has been on a rise, and presently, all the states in Nigeria have been affected by this virus (WHO, 2020). On the 16th of November 2020, Nigeria recorded 65, 148 confirmed cases, 61, 073 were discharged and 1,163 deaths in the 36 States and the Federal Capital Territory. Kebbi State recorded a total of 93 confirmed cases of Covid-19 with 8 deaths as at 16th November 2020 (Oyekanmi, 2020).

Covid-19 is considered the biggest atypical pneumonia outbreak since 2003 when the Severe Acute Respiratory Syndrome (SARS) epidemic occurred (Wang et al., 2020b). Healthcare workers (HCWs) have close contact with infected patients and are at the danger of contacting the disease. They are the most affected people in the fight against the Covid-19 (Bozdağ & Ergün, 2020). The psychological impacts of Covid-19 demands on HCWs are among crucial considerations (Greenberg et al., 2020), owing to the fact that occurrence of acute stress needs adaptive response to meet those demands (Charney, 2004). Among the successful adaptation qualities in confronting stress is active coping style. Others are altruism and emotional intelligence (Maunder et al., 2010).

Objectives of the Study

The main objective of this study was to investigate Covid-19 Pandemic Challenges, Coping Strategies and Resilience among healthcare workers using a multiple linear regression analysis.

Specific objectives were;

1. To identify the level of Covid-19 Challenges, Coping strategies and Resilience among health care workers in Kebbi State.
2. To investigate the correlation between Covid-19 challenges, Covid-19 coping strategies and Covid-19 resilience among HCWs in Kebbi State.

LITERATURE REVIEW

Studies carried out among HCWs in different parts of the world showed that HCWs are struggling with fatal Covid-19 with a lot of challenges (Rangachari & Woods, 2020), including the treatment of Covid-19 patients, minimising the infection spread, developing acceptable short-term and long term plans, as well as treating the non-Covid-19 patients (Shreffler et al., 2020). Other sources of distress are work overload, and sudden involvement of new practice scenario (Sani et al., 2020). Also, due to lack of Personal Protective Equipment (PPE) HCWs express the fear of being infected and spreading the virus to their families and other patients (Rangachari & Woods, 2020). According to Maiorano et al. (2020), repeated challenges



encountered in Covid-19 by HCWs can cause exhaustion, anxiety and stress, leading to secondary trauma. This can negatively affect their mental health (Buselli et al., 2020).

Majority of these HCWs become unstable in trying to balance their responsibility, altruism and personal fear for themselves and others (Tiong & Koh, 2013). Thus, the HCWs coping ability is important not only to themselves but also to their families and patients. Coping strategies function in reducing stress levels and lowering the possibility of developing psychological symptoms. This is supported by several study findings that developing post-traumatic symptoms could be minimised by coping strategies (Witt & Stelcer, 2018). Nevertheless, literature revealed concerns over lack of reassurance and support from Healthcare leaders for the high level of emotional distress experienced by HCWs during Covid-19 pandemic (Adams et al., 2020). Munawar and Choudhry (2020) postulated that most of the healthcare authorities are focusing on biological and physical consequences of the outbreak, giving less attention to mental health issues. This may affect the resilience state of HCWs negatively.

For the past two decades, the resilience building among HCWs has gained momentum (Chan et al., 2006). It may be a major difference between HCWs that suffered from burnout with those that do not (Fox et al., 2018). Therefore, to deliver effective care in the period of Covid-19 pandemic, a key concern is maintaining the quantity (adequate HCWs) and quality (resilience) of healthcare workforce (Adams et al., 2020). Healthcare providers vary in levels of psychological resilience, which is the ability to positively adapt to adversity to protect themselves from stress (O'Dowd et al., 2018). Jackson et al. (2007) defined psychological resilience as the individual's ability to withstand hardship; while Tugade & Fredrickson (2004) defined it as adapting to changes caused by stressful events in a flexible way and recovering from negative emotional experiences. American Psychological Association (2020) asserted that promoting psychological resilience of HCWs during pandemic is highly important.

Resilience is important in physical and mental health problems coping. It serves as a protection against onset of psychiatric disorders (Färber & Rosendahl, 2018). People with positive emotions in stressful situations have been the ones with good resilience (Tugade & Fredrickson, 2004). However, the Covid-19 pandemic is viewed to be a challenge to psychological resilience (Wang et al., 2020a), and HCWs have to face these challenges (Shreffler et al., 2020). Thus, the need for boosting resilience of HCWs in the present time of Covid-19 calls for investigations on factors explaining it for proper planning and intervention. Moreover, despite the interrelatedness and importance of challenges, coping strategies and resilience, researches that studied the correlation between the three in Covid-19 pandemic are very scanty if not unavailable at all. Also, Nigeria is one of the top 10 countries that have an increased incidence of infection. Assessing the Covid-19 Pandemic Challenges, Coping. Strategies and Resilience among Healthcare Workers will be an effective step towards controlling the disease (WHO, 2020).

METHODOLOGY

Study Design

A descriptive cross-sectional survey was employed to investigate the correlation between Covid-19 challenges, Covid-19 coping strategies and Covid-19 resilience among HCWs in Kebbi State.



Research Setting/Location

Kebbi State is in Northwestern Nigeria. It was created in 1991 from the southwestern half of Sokoto State. Kebbi borders the nations of Niger to the west and Benin to the southwest, and it borders the Nigerian states of Sokoto and Zamfara to the north and east and Niger to the south. Kebbi's area consists of short-grass savanna that is drained southwestward by the Niger River and its tributary, the Sokoto (Kebbi) River. Most of the Kainji Reservoir, formed by the Kainji Dam further downstream on the Niger River, lies in the southern portion of the state.

Agriculture is the most important economic activity, with riverine floodplains producing cash crops of peanuts (groundnuts), cotton, and rice. Subsistence crops include sorghum, millet, cowpeas, and onions. Much of the land in the state is used for grazing cattle, goats, and sheep. The major ethnic groups in the state include the Fulani, Hausa, Dakarki (Dakarawa), and Kambari. They are predominantly Muslim. The population of the state according to the 2006 population census was 3,238,628 (Encyclopaedia Britannica, 2020). Kebbi State comprises 21 Local Government Areas and 4 Emirates Councils each under a first class Emir. They are Gwandu, Argungu, Yauri and Zuru. Emir of Gwandu is the Chairman of Kebbi State Council of Chiefs (Kebbi State government, 2020).

Kebbi State has a lot of hospitals comprising primary health care facilities, secondary and tertiary hospitals which are strategically located to serve the populace accordingly. During the COVID-19 pandemic, these hospitals received a large turnout of patients.

Sampling Technique and Sample Selection

One hundred and forty three health care workers participated in the study. They are employees of Kebbi State Government, working in the various secondary and tertiary health facilities in the state.

Data Collection

Data collection was through online surveys. Three questionnaires were used as instruments for data collection. A 20 item unstructured, researcher constructed, a 5-option Likert scale "Covid-19 Pandemic Healthcare Workers Challenges Assessment Questionnaire" was used to assess the adequacy of the solutions to challenges facing HCWs in their respective health institutions. The scoring used for this questionnaire was 1=not available at all, 2=not adequate, 3=somewhat adequate, 4=adequate, and 5=very adequate. The questionnaire was found to have the reliability of 0.94 using Cronbach's alpha. Face and content validity was used in ascertaining the validity of the questionnaire. The "Covid-19 Pandemic Challenges Coping Strategies Questionnaire", a 4 option Likert scale adapted and modified Brief-COPE self-report questionnaire (Carver, 1997; Carver, Scheier, & Weintraub, 1989; Eisenberg, Shen, Schwarz, & Mallon, 2012). It was used as a 25-item questionnaire to assess the coping strategies of the respondents. The scoring used for this questionnaire was 1=I haven't been doing this at all, 2=a little bit, 3=a medium amount, and 4=I've been doing this a lot. It was found to have the reliability of 0.79 using Cronbach's alpha. Face and content validity was used in ascertaining the validity of the questionnaire. The Connor-Davidson Resilience Scale is a 5-option Likert scale adapted questionnaire from Gonzalez, Moore, Newton & Galli (2015). The CD-RISC-10 version was selected due to its suitability with this study. The scoring used for this questionnaire was 0=not true at all, 1=rarely true, 2=sometimes true, 3=often true, 4=True nearly all the time. It has the



reliability of 0.82 using Cronbach's alpha. Face and content validity was used in ascertaining the validity of the questionnaire.

A combination of consecutive sampling and convenient sampling were used as a sampling procedure for the study. This is done through an online survey in which different groups of Kebbi state HCWs were contacted for the study. The questionnaires were administered online through the groups and it was left open for the respondents to fill for the period of three months, from 15th March 2020 to 15th June 2020. The measuring scale used to analysed the Covid-19 Pandemic Healthcare Workers Challenges Assessment Questionnaire was ≤ 3.00 = very high challenge, 3.01 - 3.50 = high challenge, 3.51 - 4.00 = moderate challenge, 4.01 - 4.50 = low challenge, and 4.51 – 5.00 = very low challenge. For Covid-19 Pandemic Challenges Coping Strategies Questionnaire the measuring scale was ≤ 2.00 = very low Coping Strategies, 2.01 - 2.50 = low Coping Strategies, 2.51 - 3.00 = moderate Coping Strategies, 3.01 - 3.50 = high Coping Strategies, and 3.51 – 4.00 = very high Coping Strategies. For The Connor-Davidson Resilience Scale 10 (CD-RISC-10) the measuring scale was ≤ 2.00 = very low resilience, 2.01 - 2.50 = low resilience, 2.51 - 3.00 = moderate resilience, 3.01 - 3.50 = high resilience, and 3.51 – 4.00 = very high resilience.

Inclusion Criteria

These included medical doctors, nurses, laboratory scientists, pharmacists and community health workers working in various hospitals in the State during the COVID-19 pandemic.

Exclusion Criteria

Health care workers on study leave, sick leave, annual leave, maternity leave and other forms of leave, or those on secondment to non-clinical sector during this period of Covid-19 pandemic were not included among the subjects of study.

Ethical Consideration

Ethical approval for this research was received from the Ministry of Health, Kebbi State Health Research Ethics Committee KSHREC, and the registration Number is: 105: 19/2020. An informed consent form was sent to participants providing information on the essence of the study and seeking the respondents' consent to participate in the study. The researchers adhered to the ethical principles that guide the study, which are the principles of informed consent, respect for persons, beneficence, non-maleficence, and justice. These ensured voluntary participation by respondents and also ensured that respondents were aware of confidentiality and anonymity. Confidentiality was maintained by not giving out participants' information obtained during the study. There was no provision for the participants to write their names or endorse with any identifier. Participants were made to know that they are free to withdraw their consent at any time and end their participation in the research without any fear of retribution.

Method of Data Analysis

The data obtained was collated, cleaned, tallied, and analyzed using survey monkey software. Descriptive statistics; results were presented in frequencies and percentages on a table. Some data were transformed to Statistical Product and Service Solutions (SPSS) version 25 so as to analyse the correlation between Covid-19 challenges, Covid-19 coping strategies and Covid-



19 resilience among HCWs in Kebbi State. This was tested by regression analysis using multiple linear regression at 95% Confidence Interval (CI).

RESULTS

Table 1 shows that the majority of the respondents (28.0%) were within 31-35 years of age. The percentages of male and female respondents were nearly equal, 51.0 % and 49.0% respectively. Majority of the respondents (60.8%) were nurses. The holders of BSc/BNSc educational level constituted the highest percentage (47.6). The highest percentage in years of experience was the 1-5 years age bracket (32.9%). **Table 2** revealed that most of the respondents (89.5%) were having very high challenges. Most of the coping strategies of the respondents centered at low to moderate level (35.7% and 37.1%) respectively. Majority (27.3%) had very low resilience. **Table 3** indicates that the correlation between Covid-19 challenges (predictor variable 1) and Covid-19 resilience (outcome variable) was 0.119. The correlation between the Covid-19 coping strategy (predictor variable 2) and Covid-19 resilience (outcome variable) was 0.181. Moreover, the correlation between the predictor variables themselves is 0.301.

A multiple linear regression was done to find out whether Covid-19 challenges and Covid-19 coping strategies can significantly predict resilience of HCWs in Covid-19. The result indicated that the model was not a significant predictor of HCWs resilience. The model shows that $F(2, 140) = 2.71$, $P = 0.07$. R was 0.19, and R^2 was 0.037. There was no statistical significant contribution to the prediction of HCWs resilience from the individual predictors. For challenges of Covid-19 variable ($B = 0.080$, $P = 0.413$) and for coping strategies of Covid-19 variable ($B = 0.235$, $P = 0.069$).

DISCUSSION

The results showed that the majority of the respondents were youths less than 40years, and are within their productive ages. A high contribution from them in providing active healthcare during the Covid-19 pandemic is therefore expected. However, it was revealed that most of the respondents were nurses. This is expected since traditionally nurses constitute the majority of HCWs. The CHEWs and CHOs were least among different professionals. This may be because community health workers work in primary health centers which did not constitute part of this study. It is worth mentioning that few respondents were non-graduates. Thus, graduate HCWs dominated the secondary and tertiary healthcare centers in Kebbi state. It was found that the majority of the respondents were having 10 years of experience. This corresponds with the findings of this study that majority of the respondents were youths.

The results revealed that there is a weak correlation between the predictor variables and outcome variables. The correlation between Covid-19 challenges (predictor variable 1) and Covid-19 resilience (outcome variable) is a weak correlation. Also, the correlation between the Covid-19 coping strategies (predictor variable 2) and Covid-19 resilience (outcome variable) is weak. However, even with the weak correlation, the variables are appropriate for the model. Moreover, the correlation between the predictor variables themselves is not a strong



correlation. Strong correlation between the predictor variables is not required, and therefore the issue of multicollinearity did not exist in this study.

The result of this study revealed that HCWs were prone to high challenges of inadequate resources to practice in the period of Covid-19 pandemic. This finding is contrary to the finding of a research conducted in South-south Nigeria to assess the Knowledge, Attitudes and Fears of HCWs towards the Covid-19 Pandemic and found that 78% of the respondents strongly agreed that work place safety is adequate (Ogolodom, et al., 2020). The result indicated that the HCWs were having low to moderate coping strategies. This is contrary to a study conducted in Saudi Arabia to assess the HCWs Emotions, Perceived Stressors and Coping Strategies during a MERS-CoV Outbreak, where it was revealed that the mean scores of different strategies ranges from 0.68 - 2.82 (maximum 3). Six out of 13 strategies were having the mean above 2.0, and 5 strategies were having the mean less than 1.5 (Khalid et al., 2016). It is shown that most of the respondents of this study were having very low to moderate resilience. This is contrary to a research conducted by Lin et al. (2020) to study the factors influencing resilience of medical workers from other provinces to Wuhan fighting against 2019 novel coronavirus pneumonia, it was found that generally, participants showed a high level of resilience.

The result revealed that there is a correlation between independent variables and dependent variables, but the correlation is weak. Thus, the independent variables are not strong predictors of the dependent variable. The R^2 , which is a dependent variable variance proportion explained by the independent variables was found to be low (3.7%). Nevertheless, small R^2 values are not necessarily always problematic, and high R^2 values are not necessarily good (Frost, 2017). For instance, a high value R^2 is mostly impossible for human behaviour variables, because it is very hard to predict; and does not mean a predicted model in such a situation is valueless (Dhakal, 2019). Though the multiple linear regression shows that the independent variables are correlated with the dependent variable, the model shows no statistical significant association between the independent variables and dependent variables, $P > 0.05$. This is contrary to the findings of a study by Si et al. (2020) in a study of Psychological impact of Covid-19 on medical care workers in China, in which it was concluded that strategies promoting active coping styles with sufficient social support minimise psychological symptoms such as anxiety, stress and depression. Also previous studies suggested the most crucial buffer for negative psychological health among HCWs were active coping and social support (Li et al., 2014).

CONCLUSION

The HCWs were facing high challenges in this period of Covid-19 pandemic. The challenges include inadequate resources for prevention, training, support and counseling. There were low coping strategies and low resilience among HCWs. It was found that there is a correlation between the Covid-19 challenges and Covid-19 coping strategies with resilience of HCWs. However, the correlation was weak, and there was no statistical significant correlation between the independent variables (HCWs Covid-19 challenges and HCWs Covid-19 coping strategies) and dependent variables (resilience of HCWs). Therefore, the policy makers and hospital management should provide adequate protection equipment, psychological and social support as well as counseling against Covid-19 and other infectious diseases to HCWs. This will help in prevention of distress, anxiety and depression among HCWs.



Future Research

We recommend similar research to be carried out in other States in the Country for generalization of the findings.

RESULTS

Table 1: Socio-demographic variables of the respondents N=143

Variable	Frequency	Percentage
Age		
16 – 20	1	0.7
21-25	9	6.3
26-30	38	26.6
31-35	40	28.0
36-40	22	15.4
>40	33	23.1
Gender		
Male	73	51.0
Female	70	49.0
Profession		
CHEW	1	0.7
CHO	1	0.7
Medical Doctors	25	17.5
Lab. Scientist	13	9.1
Nurse	87	60.8
Pharmacist	16	11.2
Educational Qualification		
Diploma	41	28.7
BSc/BNSc	68	47.6
MBBS	22	15.4
MSc	9	6.3
PhD	3	2.1
Years of experience		
1-5	47	32.9
6-10	45	31.5
11-15	21	14.7
16-20	6	4.2
21-25	3	2.1
26-30	10	7.0
>30	11	7.7

**Table 2: Level of Covid-19 Challenges, Coping strategies and Resilience**

Variable	Frequency	Percentage
Challenges		
Very Low	1	0.7
Low	1	0.7
Moderate	2	1.4
High	11	7.7
Very high	128	89.5
Coping strategies		
Very Low	22	15.4
Low	51	35.7
Moderate	53	37.1
High	15	10.5
Very high	2	1.4
Resilience		
Very low	39	27.3
Low	28	19.6
Moderate	33	23.1
High	26	18.2
Very high	17	11.9

Table 3: Correlation table

Variables		Covid-19 Challenges	Covid-19 coping strategies	Covid-19 resilience
Covid-19 Challenges	Pearson Correlation	1	0.301**	0.119
	Sig. (2-tailed)		0.000	0.156
	N	143	143	143
Covid-19 coping strategies	Pearson Correlation	0.301**	1	0.181*
	Sig. (2-tailed)	0.000		0.031
	N	143	143	143
Covid-19 resilience	Pearson Correlation	0.119	0.181*	1
	Sig. (2-tailed)	0.156	0.031	
	N	143	143	143

**Correlation is significant at the 0.01 level (2-tailed), *Correlation is significant at the 0.05 level (2-tailed)



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