



## **Care of the Covid-19 Patients: Experiences of Health Workers in Rivers State Nigeria**

**Tondor Cleopatra Uzosike<sup>1\*</sup>, Alali Dan-Jumbo<sup>2</sup>, Mienye Bob-Manuel<sup>3</sup>,  
Aloni A. Alali<sup>1</sup> and Danagogo S. Lawson<sup>3</sup>**

<sup>1</sup>*Department of Community Medicine, College of Medical Sciences, Rivers State University, Nkpolu, Port Harcourt, Rivers State, Nigeria.*

<sup>2</sup>*Infection Control Unit, Rivers State University Teaching Hospital, Port Harcourt, Rivers State, Nigeria.*

<sup>3</sup>*Department of Medical Microbiology and Parasitology, College of Medical Science, Rivers State University Nkpolu, Port Harcourt, Nigeria.*

### **Authors' contributions**

*This work was carried out in collaboration among all authors. The authors in this study had access to all information collected. Authors TCU and ADJ conceptualized the study. Author TCU designed the study. All authors contributed to funding of the study. Authors MBM and AAA collected the data, while Authors TCU, ADJ, MBM, AAA and DSL repeatedly read through the transcripts. Author TCU did the data analysis, interpretation and manuscript writing. All the authors reviewed the manuscript and made corrections where necessary. All authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/IJTDH/2020/v41i2330414

#### Editor(s):

- (1) Dr. Shankar Srinivasan, Rutgers-School of Health Professions, USA.
- (2) Dr. Zhiheng Zhou, Harvard Medical School, USA, Guangzhou University, China.
- (3) Dr. Payala Vijayalakshmi, Gitam University, India.

#### Reviewers:

- (1) Anna Costagliola, University of Naples Federico II, Italy.
  - (2) Mateus Rodrigues Beguelini, Universidade Federal do Oeste da Bahia (UFOB), Brazil.
  - (3) Dr. Ivy Deirdre Mangkau, University College of Technology SarawakUniversiti Tun Hussein Onn, Malaysia.
- Complete Peer review History: <http://www.sdiarticle4.com/review-history/64077>

**Original Research Article**

**Received 08 December 2020**  
**Accepted 30 December 2020**  
**Published 31 December 2020**

### **ABSTRACT**

**Background:** Frontline health workers are faced with the overwhelming responsibility of caring for patients infected with the Coronavirus and this has seriously affected their physical and mental health status due to the rapid spread of the disease globally and the unprepared state of health workers who were recruited with little or no skills in infectious disease care. This study describes the experiences of healthcare workers involved in the management of COVID-19 patients.  
**Methods:** A qualitative study design was employed, using a phenomenological approach. In-depth interviews were conducted by telephone on health workers selected purposively from the four

\*Corresponding author: Email: [tondorj@yahoo.com](mailto:tondorj@yahoo.com);

COVID-19 treatment centers. The health workers consisted of seven doctors, three nurses, and two hygienists.

**Results:** Data collected were transcribed and content analysis was done using Atlas. Ti. Some major highlights identified include; the bravery and commitment of health workers despite their proximity to patients, the anxiety and fear of becoming infected, the inconveniencing nature of the PPEs and its effect on their work efficiency, the patients mental and health status on admission (denial, fear, co-morbidities, need for special attention), and other challenges (boredom, shortage of personal protective equipment and medications, the need for special diet and privacy by some patients). Suggestions that emerged were; training, government action, and installing security cameras in patients' wards.

**Conclusion:** Findings indicate the need for training health workers to enhance preparedness for future pandemics, provision of psycho-social support for health workers and patients, and government commitment.

*Keywords: COVID-19; healthcare workers; experiences; qualitative study.*

## 1. INTRODUCTION

A novel coronavirus was identified in January 2020, as the cause of several cases of pneumonia-like illnesses occurring in Wuhan City, China [1]. As the number of cases progressively increased and spread globally, the World Health Organization declared it a pandemic on the 11<sup>th</sup> of March, 2020 [1]. Nigeria recorded its first case on the 27<sup>th</sup> of February 2020 and now has over 80,000 confirmed cases with more than 1200 deaths from the disease [2]. About 800 of these cases are healthcare workers [3]. Nigeria, alongside several other low and middle-income countries, mostly in Africa, is adjudged as quite vulnerable to infectious disease outbreaks due to problems associated with economic development, political stability, and weak health systems [4].

Although the burden of infectious diseases in Nigeria is quite high, with recurrent outbreaks of endemic and emerging infectious diseases like Lassa fever, yellow fever, cholera, measles, meningitis, and Ebola virus disease [5-10], investment in the healthcare sector still leaves much to be desired. Despite the seemingly bleak prospects of the health system, Nigeria was remarkably noted for her coordinated containment of the Ebola epidemic of 2014 and has been commended in several reports. [11,12] However, the COVID-19 pandemic has posed a serious challenge to all sectors of the economy in the country especially the health sector. The rapidly increasing number of cases and limited carrying capacity of the health system is affecting positive patient outcomes and reducing the confidence and brevity of frontline health workers who are faced with the danger of becoming infected and being a source of

spread of the disease. Researchers have observed the sacrifices made by health workers during epidemics even at the cost of their lives. [13] Other researchers have observed that health workers are at a greater risk of psychological distress and contracting the infection during epidemics than the general population. [14,15] Healthcare workers have a crucial role to play in the fight against COVID-19 and in Nigeria, the battle is fought on many fronts despite the shortfalls of the health system.

In Rivers State Nigeria, COVID-19 response preparedness began inter alia with the designation and equipping of the General Hospital Eleme for the care and treatment of patients suspected and confirmed of having COVID-19 infection. A team of medical doctors, nurses, hygienists, and other technical assistants were employed as health personnel to cater for these patients. These health workers provided the necessary response activities. However, with the increasing number of cases in the State and an obvious increase in workload for healthcare workers at the initial treatment center, there arose the need for expansion of the capacity of the holding area and treatment centers. Thus, more facilities were opened at the Rivers State University Teaching Hospital, University of Port Harcourt Teaching Hospital, General Hospital Bonny, and the Yakubu Gowon Stadium in Port Harcourt. These provided for the needed increase in capacity of the health system to accommodate the rising number of COVID-19 cases in the state and also to ensure delivery of quality healthcare services with positive outcomes aftercare and safety of the patients and healthcare workers. Despite these efforts, the rapidly increasing number of cases has

further challenged the carrying capacity of the health system and its ability to cope with the trend. This led to some task shifting, such that health workers were reassigned away from their primary duties in the health facilities to the infectious disease units or epidemic units at the holding and treatment centers. Series of training and retraining sessions were conducted to better equip them and refresh their skills in caring for patients infected with the Coronavirus disease. These changes together with the effects of coping with the new pandemic may affect the confidence and brevity of the frontline healthcare personnel. It is therefore important to gain insights into their experiences to provide the best support they need at this crucial time and to improve on response preparedness for future pandemics.

This study seeks to identify and document the experiences of health care workers in Rivers State Nigeria, who are involved in the management of suspected or confirmed cases of COVID-19 during this Coronavirus pandemic and to make recommendations that will assist healthcare planners in the planning of future pandemics and response activities.

## **2. MATERIALS AND METHODS**

### **2.1 Study Area**

This study was conducted in Rivers State, southern Nigeria. The State is bounded by the states of Anambra and Imo on the north, Abia and Akwa Ibom on the east, Bayelsa and Delta on the west. It has mangrove swamps, tropical rainforests, and many rivers. Rivers State is the most populated among states in the Niger Delta, with a population of 5,198,716 according to the 2006 population census and a projected population of more than 7 million currently. [16] There are tertiary, secondary, and primary healthcare facilities spread across the state for access to healthcare and four treatment centers set up for the isolation and management of patients with coronavirus infection at; the General Hospital Eleme, University of Port Harcourt Teaching Hospital, General Hospital Bonny and the Yakubu Gowon Stadium in Port Harcourt. Essentially, these isolation centers have general wards, one for female patients and another for male patients. Each center, in addition, has a 4-6 bed Intensive Care Unit equipped with oxygen delivery devices and ventilators strictly for COVID-19 patients.

### **2.2 Study Design**

A phenomenological qualitative study design was employed to get an account of the subjective experiences of healthcare workers directly involved in the management of suspected or confirmed COVID-19 patients. The phenomenological qualitative study design was selected because it describes the life experiences and perceptions of participants concerning a situation and identifies shared patterns from those experiences. Phenomenology can be hermeneutical (interpretative) and transcendental (absolute). The transcendental phenomenological approach was employed for this study because it gives an absolute account of descriptions provided by the participants to document their life experiences about a situation. This is in contrast to the hermeneutical phenomenology that is dependent on what the researcher understands and explains from the life experience of the participant. [17]

### **2.3 Study Population and Sampling Technique**

The study population included medical doctors, nurses, and hygienists as key informants involved in the management of COVID-19 patients. A non-probability purposive sampling method was used to select the participants for this study. The inclusion criteria were; health care workers directly involved in the management of suspected or confirmed cases of COVID-19 for more than one-month duration and participants who felt emotionally unfit to take part in the study were excluded. A total of 12 key informants were selected, representing doctors, nurses, and hygienists.

### **2.4 Data Tool**

An open-ended interview guide was developed based on consultation from relevant literature and expert opinions. Questions in the guide included the participants' characteristics such as; age, sex, years of work experience, and category of the healthcare worker. Other questions in the guide are displayed in Table 1.

### **2.5 Data Collection**

The objective of the in-depth interview was communicated to participants on a prior

**Table 1. Interview topics**

No.	Topic Guide
1.	Describe your role in the management of COVID-19 patients
2.	Tell me your perception about patients in your care and their conditions
3.	Tell me about your experiences with the use of PPEs
4.	Describe your feelings about contracting COVID-19
5.	Describe the challenges encountered in caring for COVID-19 patients
6.	Tell me your suggestions on how health workers can prepare better for pandemics

date by SMS to secure privacy, and a specific time for the interview was scheduled at the participants' convenience. Telephone interviews were done by interviewers with experience in qualitative data collection and active listening skills. Clarifications were made where necessary to enhance data validity and prevent bias during data collection. Information was recorded after permission was granted by the participant. Participants were assured of confidentiality for all conversations made. The interviews lasted for an average of 35 minutes and were conducted between July 7<sup>th</sup> to 14<sup>th</sup>, 2020, based on the convenient date of the participants.

**2.6 Data Analysis**

All audio records were transcribed by a professional transcriptionist verbatim within 24 hours to achieve data validity. Two of the researchers read and reviewed the transcripts thoroughly to reduce subjective bias. Transcripts were entered into Atlas. ti Version 8.4.24 and quotations that provided answers to questions in the interview guide were derived. Short sentences or words that gave a brief meaning of the quotes were allocated to each quotation and the codes were used to give the frequencies of similar quotations or quotations with the same meaning.

**3. RESULTS AND DISCUSSION**

**3.1 Participants' Characteristics**

Table 2 shows the details of participants' characteristics. Our study included seven doctors, three nurses, and two hygienists purposively selected from the four COVID-19 treatment centers in Rivers state who voluntarily agreed to participate when contacted. Two other nurses and one hygienist initially included in the study declined due to personal reasons. Thematic saturation was however achieved by the tenth interview and the other two interviews

were conducted to confirm it, although the emphasis on saturation is not encouraged by some researchers for phenomenological studies. [18] of the participants, 8 males and 4 females, the average age of participants was 38.2 years and the average years of work experience was 11.3 years.

**3.2 Roles and Responsibilities**

The finding in Table 3 is a description of the roles and responsibilities of the health workers caring for patients with COVID-19. Giving medications was the most frequent role played by health workers (4 quotations) followed by counseling and educating patients (3 quotations) and decontamination (2 quotations). The results imply that health workers are in close proximity when caring for patients and even those with infections such as COVID-19 that are highly infectious. This puts them at a high risk of getting infected, makes them a source of disease spread to other patients and family members, but shows the courage and efforts inputted in caring for the patients [19].

**3.3 Perception of Patients and their Conditions**

The results displayed in Fig. 1 shows how the health workers narrated the health conditions of COVID-19 patients in their care and some codes emerged from records of their experience including; fear, the occurrence of comorbidity in some patients, being compliant to treatment needing special attention and those who were in denial. Table 4 shows that denial was the most common observation made about the patients' health status and condition. This has been identified as a maladaptive coping strategy for the stress of being infected with the disease and is known to have a significant adverse effect on the health and wellbeing of patients as well as on their treatment outcome. [20] Another

common observation made by the participants was that some patients needed special attention (requiring ventilators) either because they were already in a bad state from COVID-19 infection before hospital admission or they had pre-existing diseases. The implication of this is that participants had more tasks to do in caring for patients in this category as studies have reported that COVID-19 patients with pre-existing illnesses come down with an alteration in their mental wellbeing, a longer length of hospital stay, need for intensive care, and higher death rates. [21,22] This also implies that health workers need to have skills to care for COVID-19 patients who need special attention. Fear was also noticed by the participants to occur in some patients and this is also a maladaptive coping strategy found among patients with the disease [20].

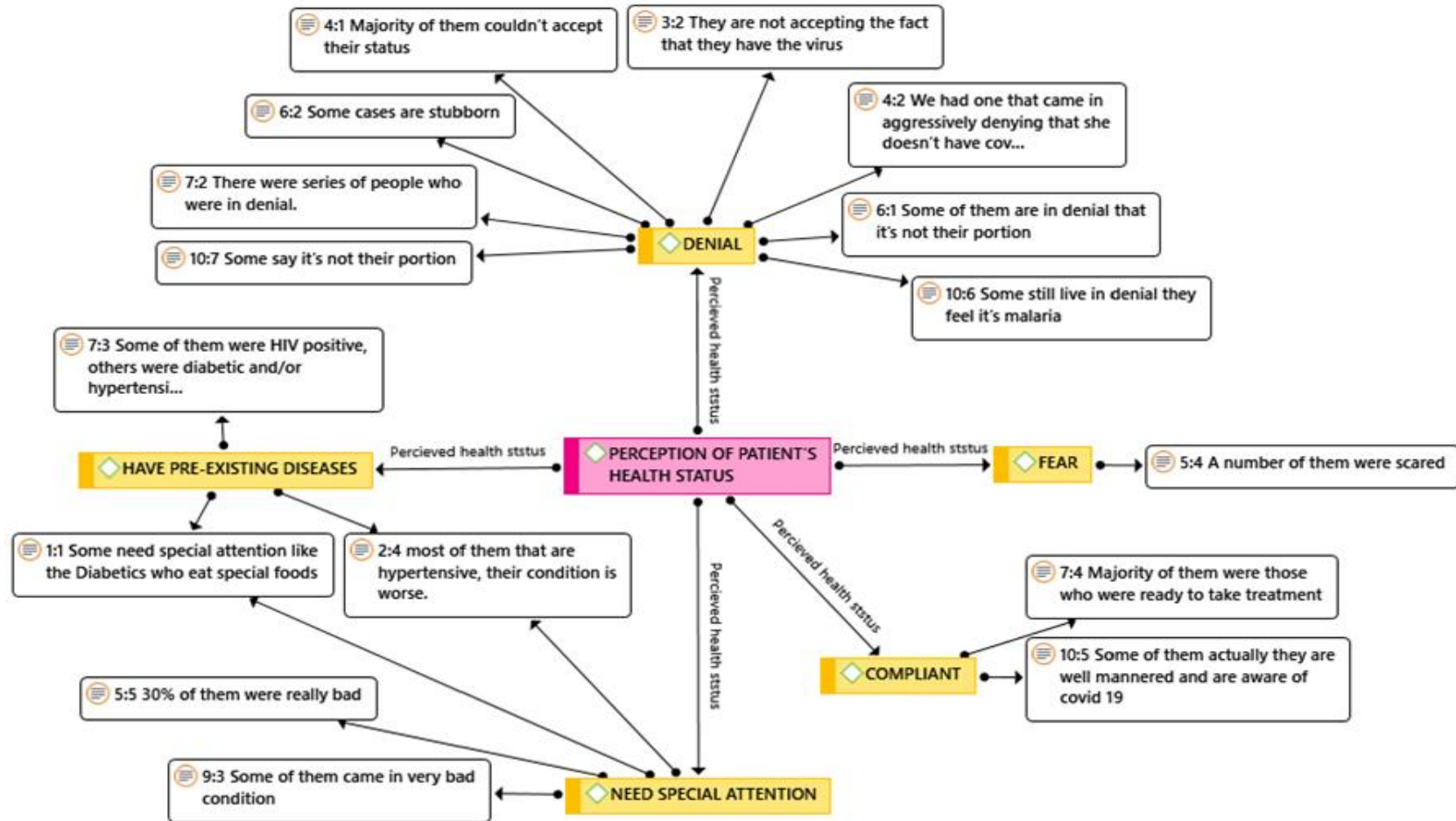
### 3.4 Experiences with the Use of PPE

A total of six themes emerged from exploring the participants' experience with the use of personal protective equipment (PPE) specifically, the full body biohazard/ hazmat suit while caring for patients infected with COVID-19 (Fig 2). A greater number of participants reported that the PPEs were always available compared to those who reported non-availability (Table 5). The availability of PPE is in line with the WHO recommendations for the rational use of personal protective equipment when caring for patients with COVID-19 [23] and this implies that the risk of disease transmission from patients to health workers will be minimal, however, some participants reported shortage of PPE at

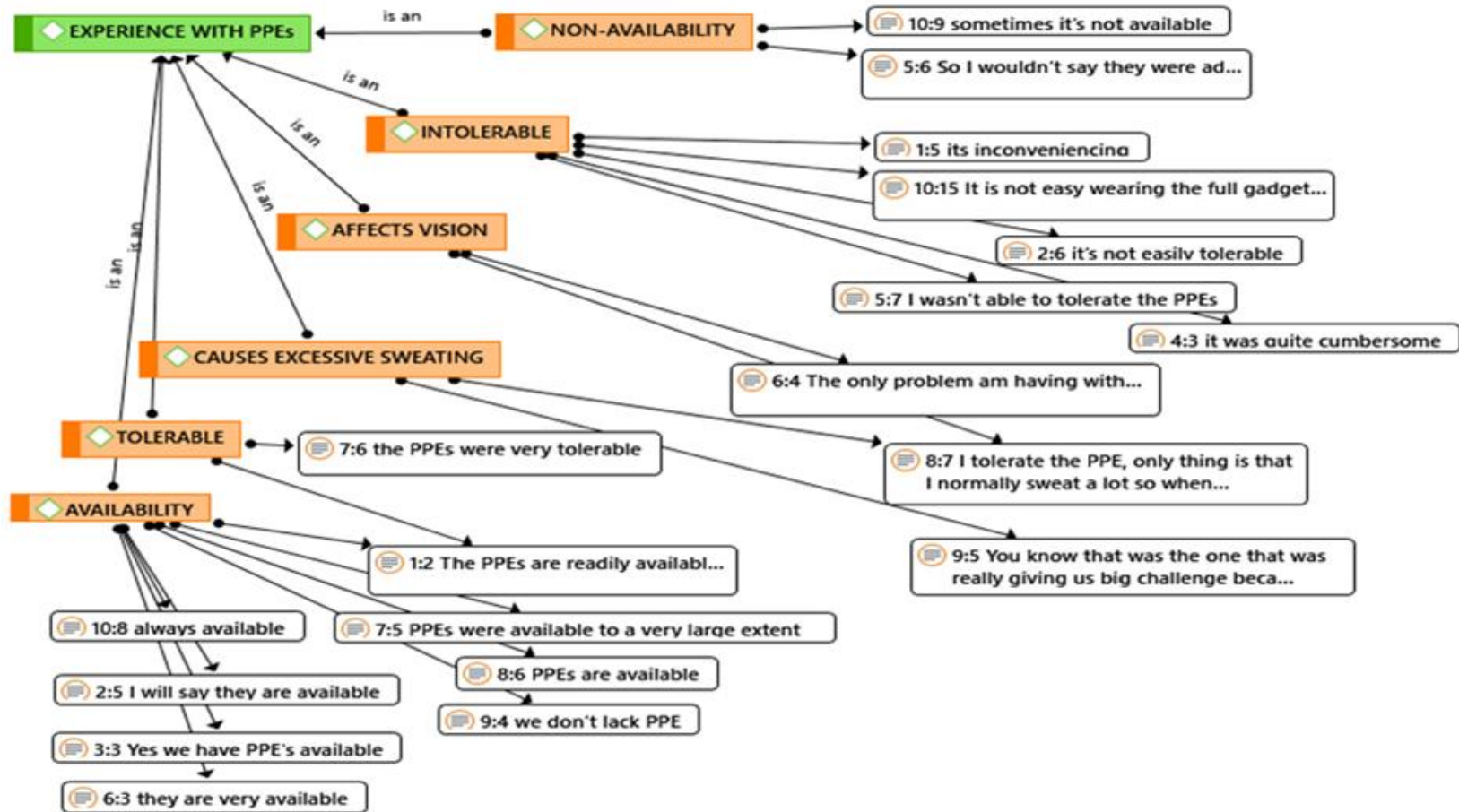
certain times. shortages have been reported to increase the risk of transmission of the disease while others may suffer anxiety and depression due to lack of PPE. [24,25] Participants also reported that the PPEs are inconveniencing and intolerable. This corroborates with observations of Chughtai AA et al and Smith P, where health workers described that the facemask causes discomfort and limits their compliance to the use of PPEs which is an important step in preventing infection transmission in infectious disease hospitals settings. [26,27] In this study, health workers also reported the experience of excessive sweating with the use of PPE. This corroborates with findings made by Purushothaman et al, Amit et al and Lee et al, [28-30] who observed similar complaints among their participants. Excessive sweating is therefore one of the challenges to the use of PPE and may occur as a result of thermal stress and the body's regulatory process of maintaining homeostasis and preventing damage to the body due to excessive heat. Impairment of vision was another report made by participants. As they explained, this is due to excess sweat entering the eyes and the formation of fog in the goggle they wear as part of the PPE. A similar experience was reported by more than fifty percent of the participants in a study by Yánez. [31] This challenge of impaired visibility from excess sweating and goggle fog formation together with other problems with the use of PPE may affect the delivery of quality health services to the COVID-19 patients and may increase the occurrence of errors while providing these services [32].

**Table 2. Participants characteristics**

Characteristic	Category of Health worker			Total
	Doctors	Nurses	Hygienists	
Sex				
Male	5	1	1	7
Females	2	2	1	5
Age				
31 – 40	4	2	2	8
41 – 50	3	1	-	4
Work experience (Years)				
1 – 10	3	-	2	2
11 - 20	2	3	-	8
>20	2	-	-	2



**Fig. 1. Perception of patients' health status**  
 The reference numbers e.g. 4:1 indicates the transcript and quotation number from the transcript



**Fig. 2. Experiences with the use of PPEs**  
 The reference numbers e.g. 10:9 indicates the transcript and quotation number from the transcript

**Table 3. Description of roles and responsibilities**

Codes	Frequency
Give medications	4
Counsel and educate patients	3
Decontamination	2
Bath patients were necessary	1
Collect samples	1
Give food	1
Manage waste	1
Take history	1
Take vital signs	1
Treat other infections	1
Wound dressing	1

**Table 4. Perception of patients and their conditions**

Code	Frequency of Quotations
Denial	8
Need special attention	4
Compliant	2
Have pre-existing diseases	2
Fear	1

**Table 5. Experiences with the use of PPE (Hazmat suit)**

Experience With PPE	Frequency of quotations
Availability	8
Inconveniencing	4
Tolerable	3
Affects vision	2
Causes excessive sweating	2
Intolerable	2
Non-availability	2

### 3.5 Feelings about Contracting COVID-19

Fear was the most frequent feeling about contracting COVID-19 especially at the initial start of caring for the patients, for example;

*“when this issue came we were scared and that fear made us properly know how to wear the PPE”*

*“when we started we had the fear that we could get infected but with time the fear exited”*

*“I was actually scared”*

*“I was afraid”*

*“I think I have the chance to contact it here”*

*“I can’t imagine contacting this thing”*

The occurrence of fear among health workers in this study is a manifestation of psychosocial stress and this has been known to affect the mental wellbeing of the health workers which can consequently affect the quality of services rendered. [33,34] This confirms observations of Hu et al in China who identified that about ninety percent of the frontline health workers had fear of becoming infected with COVID-19 [33].

Other participants showed some level of confidence and reported that they had no fear of contracting the disease and if it occurs otherwise, they believed it could be cured. Their responses were;

*“I’m not scared of the virus”*

*“but I just had those thoughts that even if I get infected, I will be ok”*

*“I don’t believe that I can contact it”*

*“it’s not a death sentence”*

*“I don’t feel scared”*

*“it can happen to anyone”*

*“with the knowledge of the IPC procedures I have, if I follow it strictly I would not risk been infected”*

### 3.6 Challenges Encountered in Caring for COVID-19 Patients

The results in Fig. 3 show that participants experienced some challenges while caring for patients with COVID-19. Codes that emerged were; challenges with the use of PPEs, boredom, challenges with feeding patients, lack of medications, and challenges in the wards. Others reported that they had no challenge. The quotations listed in Table 6 shows mixed views concerning the challenges experienced. The most common challenge was with the personal protective equipment especially with wearing them for prolonged periods of time. This agrees with reports of Shaukat et al [35] and poses a challenge as it can decelerate healthcare services to patients and also affect the mental state of health workers. Other health workers reported boredom as a challenge and this can also affect their psychosocial state. Some participants experienced challenges in caring for the patients due to a lack of specific needs such as special diets and medications for those with



comorbidities such as Diabetes. There was also the need for privacy and personal space by the patients especially those who were not in the intensive care unit. However, some participants stated that management of patients will be more difficult if every patient had to be kept in a private ward.

### 3.7 Suggestions on How Health Workers Can Prepare Better for Pandemics

Fig. 4 shows suggestions made by healthcare workers that will improve the service they provide to COVID-19 patients. The codes that emerged include; government actions, training, and media security. The quotations stated were;

#### Government actions;

*“Government should properly equip hospitals and make provision for a regular budget for health issues”*

*“we need more infectious disease hospitals.”*

*“Budget for the health sector should increase”*

*“Training and recruiting of health workers”*

#### Training:

*“Protective measures should be taken and preparation for any pandemic should be done”*

*“Every health workers working here and in all the facilities should try to go for IPC training”*

*“In times of pandemic like this so let’s do extra training for some group of staffs who are interested”*

*“Everybody should be trained”*

*“training”*

*“training for IPC”*

#### Security Camera:

*“they call it CCTV camera they should put it. Yes, CCTV because when we are out of the wards, we cannot see the patients inside. This is necessary so we can monitor what is going on in there it’s very important”*

The results imply that government commitment is needed to improve health facilities in the state, with reference to the management of patients with COVID -19. This commitment requires increased budgetary allocation for health, building infectious disease hospitals, equipping them, and recruiting more health workers. ‘Training’ was another theme that emerged frequently from the participants as suggestions to improve the quality of services rendered. These suggestions are noteworthy as the World Health Organization has recommended the use of multidimensional interventions for pandemics like COVID-19 including; strong commitment from the government, capacity building of the health workers and improved human resource management, strong financial commitment, and improving infrastructure to create an enabling environment for both the health workers and patients [36]. A notable suggestion made by a participant was to install closed-circuit television (CCTV) cameras to monitor patients when they are physically absent from the ward, to record any event that may occur before the arrival of well-kitted health workers. Though the reason for this suggestion is rational, as it can protect the rights of health workers, patients, and management. Ethical considerations however need to be made since patients are entitled to privacy and autonomy. Further studies can be done to determine if there are any advantages with the use of CCTV cameras for monitoring COVID-19 patients, including possible risks that may occur with its use.

**Table 6. Challenges encountered by participants**

Challenges	Quotations
Boredom	<i>“the challenge I faced was boredom”</i>
Feeding	<i>“Some people needed some special diet”</i>
Medication	<i>“medications are not readily available in the hospital”</i>
No challenge	<i>“never had any challenges”</i>
PPE	<i>“shortage of PPE’s”</i> <i>“staying under the PPE for a long time”</i> <i>“always wearing the PPE and going to see them was quite challenging”</i> <i>“duffing, initially it was a challenge”</i>
Ward	<i>“Certain persons you know basically they want to have a different type of food. Some want to have their personal space in the ward”.</i>

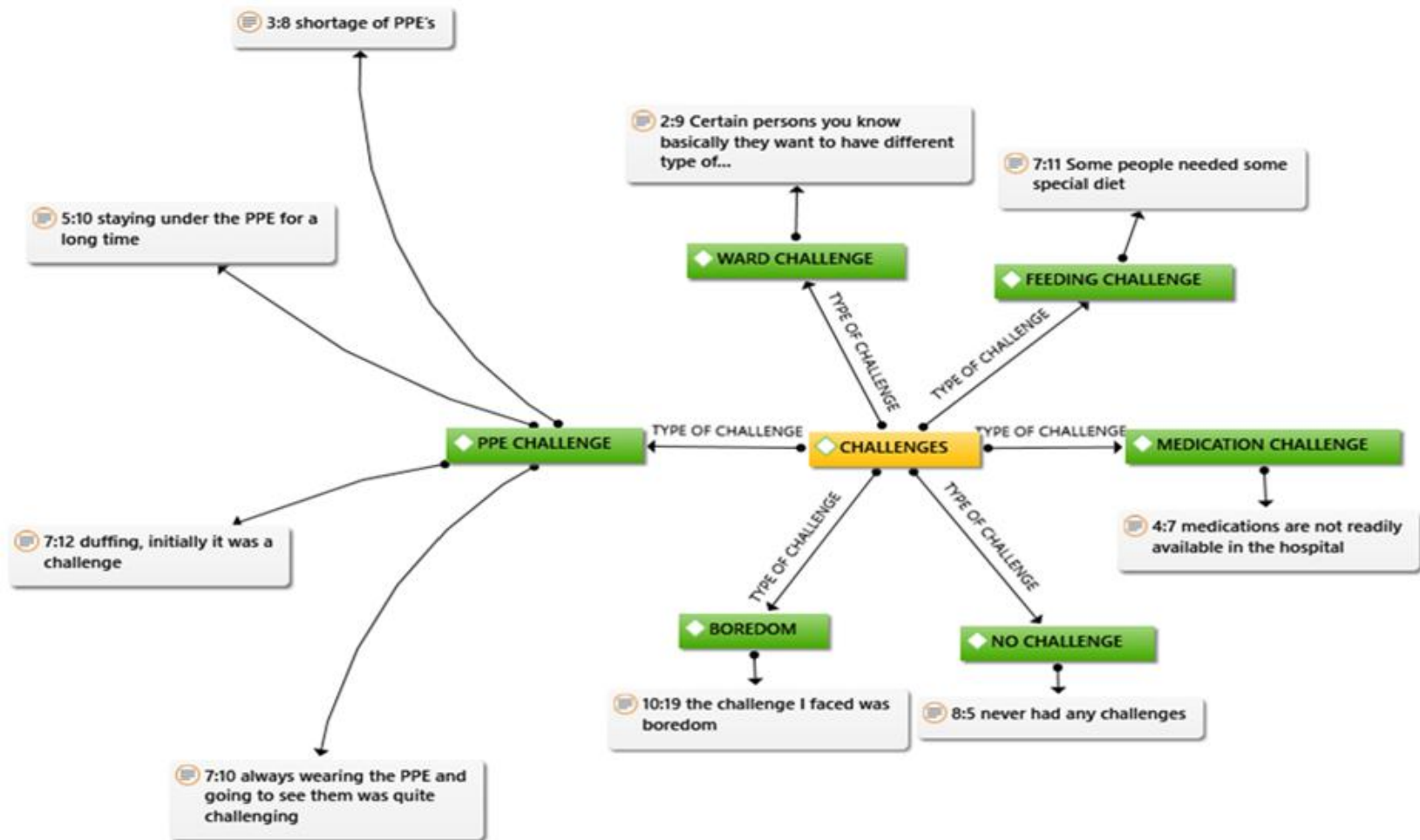
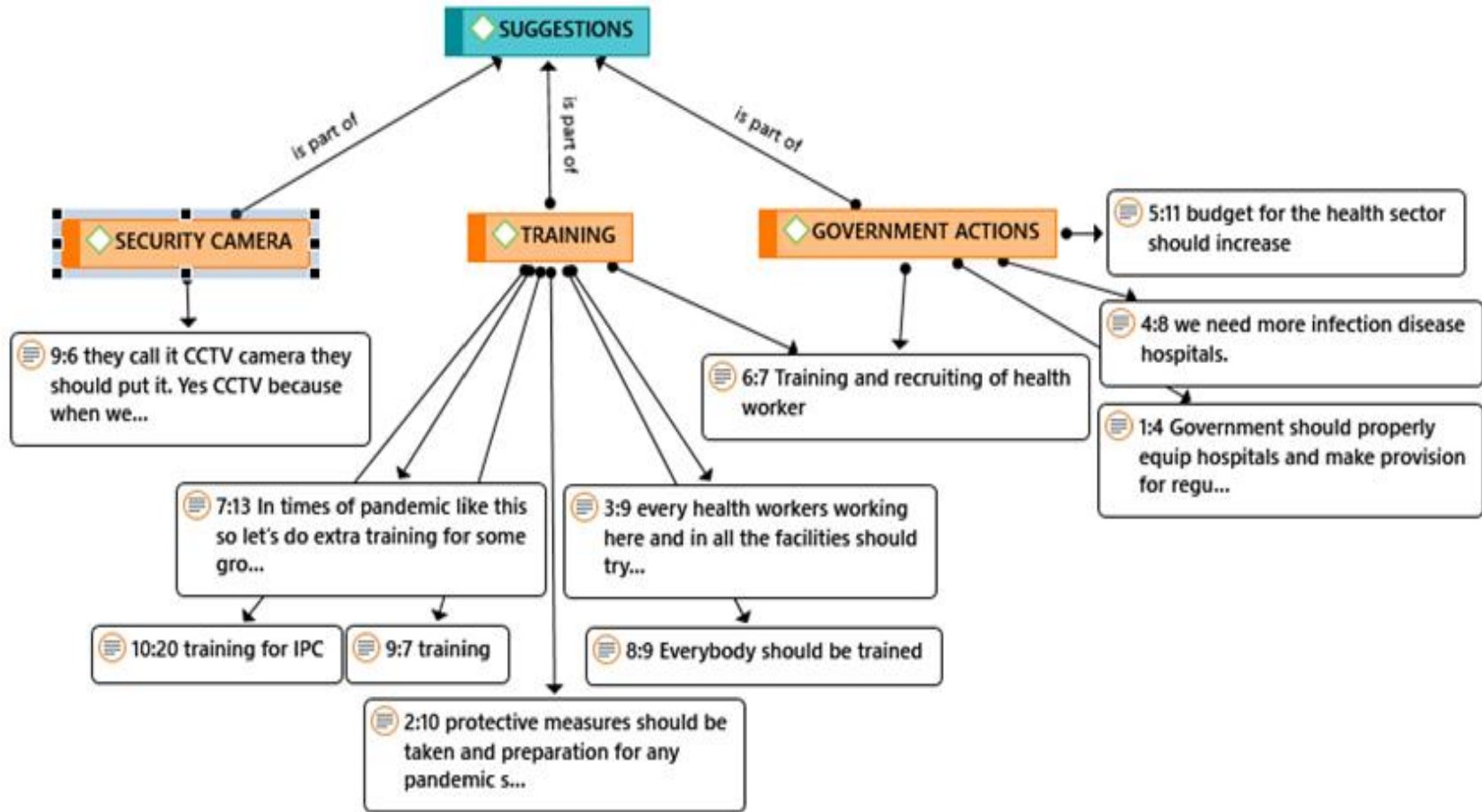


Fig. 3. Challenges encountered in caring for COVID-19 patients



**Fig. 4. Suggestions made by participants**

*The reference numbers e.g. 9:6, indicates the transcript and quotation number from the transcript*

#### 4. SUMMARY OF FINDINGS

In this study we documented the lived experiences of doctors, nurses, and hygienists caring for patients infected with the Coronavirus, identified their areas of need, and offered suggestions that will enable them to improve on the services rendered to patients. In this study, participants stated their roles and responsibilities concerning the care they offer to patients. Their reported experiences indicate that physical distancing, which is one of the preventive measures against COVID-19 infection cannot be maintained, as the health workers have to give medications, counsel and educate patients, collect samples, etc. Though they are fully kitted with the necessary personal protective equipment and ensure other infection prevention and control measures are observed. This finding also displays the willingness and commitment made by health workers to do their jobs despite the known risks they may encounter.

Five codes were extracted about how participants perceived the health status of patients, including; denial, need for special attention, compliant, having pre-existing diseases and fear. Documenting this is important as knowing the physical, mental and social status of patients can aide better management processes and procedures. Patients who live in denial and fear may not comply with the treatment given or adhere to medications until complications arise. This can negatively affect the care and management of the patients and treatment outcome. There is more psychosocial task to be accomplished by the health workers to ease patient's fears, help them understand that they are infected and need to be treated, and pay extra attention to patients who have pre-existing comorbidities and need special attention.

From the experiences of participants concerning the use of PPEs, the themes that emerged were; availability, inconvenience, tolerable, affects vision, causes excessive sweating, intolerable, and non-availability. The mixed reports are similar to findings from other studies, however, the negative experience can limit the efficiency of health workers in caring for COVID-19 patients, especially among those who felt inconvenienced, sweaty, and had blurred vision from the fogging goggles. The lack of PPE has also been reported in other treatment centers and this can heighten

their fear of being infected in the course of performing their duties.

There were mixed feelings among participants about getting infected with the Corona Virus. Some expressed fear while others had some level of confidence about not getting infected or getting treated if they become infected.

Challenges faced by participants from their experience include; boredom, the need for special diet by patients, shortage of medications for the patients, problems with the PPEs, and some patients wanting to have private spaces within the general wards. One participant had no challenge and was satisfied with the work experience at the time of data collection. Meeting the needs of the health workers and proffering solutions to challenges they experience will improve the quality of service provided.

Participants discussed suggestions they felt will help them improve in their care for patients infected with the Coronavirus. Three codes were extracted, including; security camera installation, training, and government actions. There was quite some emphasis on training, implying that participants need to improve on their knowledge and skills as concerns the management of COVID-19 patients and preparedness for future pandemics.

#### 5. LIMITATIONS

Some limitations of this study are; firstly, participants were purposively selected to provide the needed information, therefore applying findings to the general population should be based on verification from probability studies. Telephone interviews that were done limited the ability of researchers to observe unspoken prompts.

#### 6. CONCLUSION

In this study, we observed that shortage and poor tolerance of the personal protective equipment, the psychosocial status of the patients in the care of health workers, the fear of being infected, and the need to improve on their skills among health workers had a role to play in service delivery and performance among health workers. There is a need for establishing psychosocial support units for health workers to safeguard their emotional wellbeing. Periodic

training and retraining to improve their skills in holistic management of COVID-19 patients should be considered in programs for intervention and decision making. Infrastructural and manpower development for infectious disease hospitals especially in the African setting should be considered to prepare for future pandemics.

### CONSENT AND ETHICAL APPROVAL

Ethical approval was sought from the Ethical committee of the Rivers State Hospitals Management Board (RSHMB/RSHREC/11.20/VOL.8/065). Verbal and written informed consent was obtained from voluntary participants.

### ACKNOWLEDGEMENTS

We appreciate all respondents who participated in this study for their time and willing participation.

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

### REFERENCES

1. Lekhraj Rampal MB, Seng LB. Coronavirus disease (COVID-19) pandemic. *Med J Malaysia*. 2020;75(2):95–7.
2. NCDC. COVID-19 Nigeria; 2020. Available: <https://covid19.ncdc.gov.ng/>
3. Tih F. Nigeria: 800 health workers infected with COVID-19. *Anadolu Agency*; 2020. Available: <https://www.aa.com.tr/en/africa/nigeria-800-health-workers-infected-with-covid-19/1863747>
4. Moore M, Gelfeld B, Adeyemi Okunogbe C. Identifying future disease hot spots: infectious disease vulnerability index. *Rand Heal Q*. 2017;6:3.
5. Tambo E, Adetunde OT, Olalubi OA. Re-emerging Lassa fever outbreaks in Nigeria: Re-enforcing “One Health” community surveillance and emergency response practice. *Infectious Diseases of Poverty*. 2018;7(1):37.
6. Nwachukwu WE, Yusuff H, Nwangwu U, Okon A, Ogunniyi A, Imuetinyan-Clement J et al. The response to re-emergence of yellow fever in Nigeria, 2017. *International Journal of Infectious Diseases*. 2020; 92:189-96.
7. Adagbada AO, Adesida SA, Nwaokorie FO, Niemogha MT, Coker AO. Cholera epidemiology in Nigeria: An overview. *Pan African Medical Journal*. 2012;12(1).
8. Saleh JE. Trends of measles in Nigeria: A systematic review. *Sahel Med J*. 2016;19(1):5.
9. Omeh D, Ojo B, Omeh C. Recurring epidemics of meningococcal meningitis in African meningitis belt: A Review of Challenges and Prospects. *J Adv Med Med Res*. 2017;22(9):1–12.
10. Otu A, Ameh S, Osifo-Dawodu E, Alade E, Ekuri S, Idris J. An account of the Ebola virus disease outbreak in Nigeria: Implications and lessons learnt. *BMC Public Health*. 2018;18(1):1-8.
11. Adeyi O. Health system in Nigeria: From underperformance to measured optimism. *Health Systems & Reform*. 2016;2(4):285-9.
12. Ebenso B, Otu A. Can Nigeria contain the COVID-19 outbreak using lessons from recent epidemics? *The Lancet Global Health*. 2020; 8(6):e770.
13. Green A. Remembering health workers who died from Ebola in 2014. *The Lancet*. 2014;384(9961):2201-6.
14. Du J, Dong L, Wang T, Yuan C, Fu R, Zhang L et al. Psychological symptoms among frontline healthcare workers during COVID-19 outbreak in Wuhan. *General hospital psychiatry*; 2020.
15. Wu PE, Styra R, Gold WL. Mitigating the psychological effects of COVID-19 on health care workers. *Cmaj*. 2020;192(17): E459–60.
16. National Bureau of Statistics. *Demographic Statistics Bulletin* [Internet]. [cited 2020 Jun 12]; 2017. Available: <https://nigerianstat.gov.ng/download/775>
17. Neubauer BE, Witkop CT, Varpio L. How phenomenology can help us learn from the experiences of others. *Perspect Med Educ*. 2019;8(2):90–7.

18. Van Manen M, Higgins I, van der Riet P. A conversation with Max van Manen on phenomenology in its original sense. *Nursing & health sciences*. 2016;18(1):4-7.
19. Calò F, Russo A, Camaioni C, De Pascalis S, Coppola N. Burden, risk assessment, surveillance and management of SARS-CoV-2 infection in health workers: A scoping review. *Infectious Diseases of Poverty*. 2020;9(1):1-1.
20. Umucu E, Lee B. Examining the impact of COVID-19 on stress and coping strategies in individuals with disabilities and chronic conditions. *Rehabil Psychol*. 2020; 65(3):193–8.
21. Flythe JE, Assimon MM, Tugman MJ, Chang EH, Gupta S, Shah J et al. Characteristics and outcomes of individuals with pre-existing kidney disease and COVID-19 admitted to intensive care units in the United States. *American Journal of Kidney Diseases*; 2020.
22. Ebinger JE, Achamallah N, Ji H, Claggett BL, Sun N, Botting P et al. Pre-existing characteristics associated with Covid-19 illness Severity. *Med Rxiv*; 2020.
23. World Health Organization. Rational use of personal protective equipment for coronavirus disease (COVID-19): Interim guidance, 27 February 2020. World Health Organization; 2020.
24. Gitau E. Frontline health workers are at great risk due to lack of adequate PPE [Internet]. [cited 2020 Nov 16]. Available: <https://www.medicwestafrica.com/en/media/covid-19-updates/frontline-health-workers-are-great-risk-due-lack-adequate-ppe.html>
25. Smith P. Health-care workers lacking PPE suffer from more anxiety and depression [Internet]; 2020. Available: <https://theconversation.com/health-care-workers-lacking-ppe-suffer-from-more-anxiety-and-depression-145612>
26. Chughtai AA, Seale H, Dung TC, Hayen A, Rahman B, Raina MacIntyre C. Compliance with the use of medical and cloth masks among healthcare workers in Vietnam. *Ann Occup Hyg*. 2016; 60(5):619–30.
27. Chughtai AA, Seale H, Dung TC, Maher L, Nga PT, MacIntyre CR. Current practices and barriers to the use of facemasks and respirators among hospital-based health care workers in Vietnam. *American Journal of Infection Control*. 2015;43(1):72-7.
28. Purushothaman PK, Priyanga E, Vaidhyswaran R. Effects of prolonged use of Facemask on Healthcare Workers in tertiary care hospital during COVID-19 pandemic. *Indian J Otolaryngol Head Neck Surg*. 2020;1–7.
29. Adewuyi G, Fowotade A, Adewuyi B. Lassa Fever: Another Infectious Menace. *African J Clin Exp Microbiol*. 2009;10(3) :144–55.
30. Lee J, Venugopal V, Latha PK, Alhadad SB, Leow CHW, Goh NY De et al. Heat stress and thermal perception amongst healthcare workers during the COVID-19 pandemic in India and Singapore. *Int. J. Environ. Res. Public Health*. 2020;17(21): 8100. Available: <https://doi.org/10.3390/ijerph17218100>.
31. Yáñez Benítez C, Güemes A, Aranda J, Ribeiro M, Ottolino P, Di Saverio S et al. Impact of personal protective equipment on surgical performance during the COVID-19 pandemic. *World J Surg*. 2020; 44(9):2842–7.
32. Loibner M, Hagauer S, Schwantzer G, Berghold A, Zatloukal K. Limiting factors for wearing personal protective equipment (PPE) in a health care environment evaluated in a randomised study. *PLoS One*. 2019; 14(1).
33. Hu D, Kong Y, Li W, Han Q, Zhang X, Xia Zhu L et al. Frontline nurses' burnout, anxiety, depression, and fear statuses and their associated factors during the COVID-19 outbreak in Wuhan, China: A large-scale cross-sectional study. *EClinical Medicine*; 2020. Available: <https://doi.org/10.1016/j.eclinm.2020.100424>
34. Wang H, Liu Y, Hu K, Zhang M, Du M, Huang H et al. Healthcare workers' stress when caring for COVID-19 patients: An altruistic perspective. *Nurs Ethics*. 2020; 27(7):1490–500.
35. Shaukat N, Ali DM, Razzak J. Physical and mental health impacts of COVID-19 on healthcare workers: A scoping review. *International Journal of Emergency Medicine*. 2020;13(1):1-8.

36. Dieleman M, Hammeijer JW. Improving health worker performance: In search of promising practices. Geneva: World Health Organization. 2006:5-34.

---

© 2020 Uzosike et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<http://www.sdiarticle4.com/review-history/64077>