

## Assessment of challenges inhibiting effective delivery of health care services among frontline Professional health workers during COVID 19 Lock down in Nigeria.

Awolola, E.<sup>1,2</sup>, Maharaj, S.<sup>1</sup>

### Abstract

**Background:** Coronavirus (COVID-19) increased patient loads globally, having a negative impact on health services. Social distancing is one strategy to prevent spreading COVID-19 but creates challenges for health professionals. This study assessed the challenges of COVID-19 for selected health professionals in Nigeria.

**Methodology:** This is a cross-sectional survey of challenges inhibiting health care service provision during COVID 19 lockdown. Data collected with a pretested online self-administered questionnaire included age, gender, occupation, place of practice, physical distance practices, utilization of telemedicine, income and other concerns that may have inhibited their practices during the COVID 19 lockdown. Data were analyzed using a statistical package for social sciences (SPSS) version 26.0 with the level of significance set at  $p < 0.05$ . Chi square goodness of fit test was used to analyze the association between means and qualitative variables.

**Results:** Response rate from 599 questionnaires was 481 (78%) with physiotherapists (n=108, 23%); nurses (n=106, 22%); doctors (n=86, 18%); laboratory technicians (n=87, 18%) and pharmacists (n=94, 19%); in public sector (n=318, 66%) and private practitioners (n=163, 34%). During the "lockdown" patients interacting with health professionals in private practice decreased except increases for laboratory technicians (11.91%) and pharmacists (68.35%). Social distancing was feasible by pharmacists and laboratory technicians, but interactions by nurses, physiotherapists and doctors were compromised. Telemedicine was used mostly by doctors (n=42, 48.8%), and physiotherapists (n=50, 46.3%). Health professionals experienced mental stress 428 (89%); anxiety 176 (37%); feared infection 333 (69%) and 232 (48%) of transmitting to their families; 307 (64 %) had challenges with personal protective equipment. Suggestions were: alternate accommodation or longer shifts with less working days 111 (37%); a hazard allowance 244 (51%) and counseling 238 (49%).

**Conclusion:** Social distancing affected healthcare delivery, with some using telemedicine to access health services. Private practitioners reported a loss of income with all health professionals indicating the "lockdown" and COVID-19 compromised health delivery, health services, and individuals' health. Health professionals suggested a hazard allowance, alternate accommodation, and dedicated counseling for health professionals during the pandemic.

**Key words:** COVID 19, health care delivery, frontline workers, social distancing, telemedicine.

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## Evaluation des défis qui entravent la prestation efficace des services de santé parmi les agents de santé professionnels de première ligne pendant le verrouillage de COVID 19 au Nigéria

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### Résumé

**Contexte général de l'étude:** Le coronavirus (COVID-19) a augmenté le nombre de patients dans le monde, ce qui a eu un impact négatif sur les services de santé. La distanciation sociale est une stratégie pour empêcher la propagation du COVID-19, mais crée des défis pour les professionnels de la santé. Cette étude a évalué les défis de COVID-19 pour des professionnels de la santé sélectionnés au Nigéria.

**Méthode de l'étude:** Il s'agit d'une enquête transversale sur les défis qui entravent la prestation de services de santé pendant le confinement lié à la COVID 19. Les données recueillies à l'aide d'un questionnaire auto-administré en ligne prétesté comprenaient l'âge, le sexe, la profession, le lieu de pratique, les pratiques de distance physique, l'utilisation de la télémédecine, le revenu et d'autres préoccupations qui auraient pu entraver leurs pratiques pendant le confinement lié à la COVID 19. Les données ont été analysées à l'aide d'un progiciel statistique pour les sciences sociales (PSSS) version 26.0 avec le niveau de signification fixé à  $p < 0,05$ . Le test d'ajustement du chi carré a été utilisé pour analyser l'association entre les moyennes et les variables qualitatives.

**Résultats de l'étude:** Le taux de réponse de 599 questionnaires était de 481 (78 %) avec des physiothérapeutes ( $n = 108, 23 \%$ ) ; infirmières ( $n = 106, 22 \%$ ) ; médecins ( $n=86, 18 \%$ ) ; techniciens de laboratoire ( $n=87, 18\%$ ) et pharmaciens ( $n=94, 19\%$ ) ; dans le secteur public ( $n=318, 66\%$ ) et les praticiens privés ( $n=163, 34\%$ ). Pendant le «confinement», les patients interagissant avec des professionnels de santé en pratique privée ont diminué sauf des augmentations pour les techniciens de laboratoire (11, 91%) et les pharmaciens (68,35%). La distanciation sociale était réalisable par les pharmaciens et les techniciens de laboratoire, mais les interactions des infirmières, des physiothérapeutes et des médecins étaient compromises. La télémédecine était principalement utilisée par les médecins ( $n = 42, 48,8 \%$ ) et les physiothérapeutes ( $n = 50, 46,3 \%$ ). Les professionnels de la santé ont subi un stress mental 428 (89 %) ; anxiété 176 (37%); craignaient l'infection 333 (69%) et 232 (48%) de la transmettre à leur famille ; 307 (64 %) avaient des problèmes avec l'équipement de protection individuelle. Les suggestions étaient les suivantes : logement alternatif ou quarts de travail plus longs avec moins de jours de travail 111 (37 %) ; une allocation de risque 244 (51 %) et des conseils 238 (49 %).

**Conclusion:** La prestation des soins de santé a été affectée par la distanciation sociale, certains utilisant la télémédecine. Les praticiens privés ont signalé une perte de revenus, tous les professionnels de la santé indiquant que le « confinement » et la COVID-19 ont compromis la prestation des soins de santé, les services de santé et la santé des individus. Les professionnels de la santé ont suggéré une allocation de risque, un logement alternatif et des conseils dédiés aux professionnels de la santé pendant la pandémie.

**Mots-clés :** COVID 19, prestation de soins de santé, travailleurs de première ligne, distanciation sociale, télémédecine

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## INTRODUCTION

The novel Coronavirus, referred to as COVID-19, created social, economic, and health crises globally, with the pandemic affecting people's activities and lives. The incidence, prevalence, and severity of COVID 19 is now a major health crisis for health professionals, health delivery, and individuals worldwide (1). It has affected and continues to affect all nations, continents, races, and socioeconomic groups. The outbreak of COVID-19 continues to have a dramatic impact throughout the world, and the incidence and prevalence increase rapidly daily, with current figures well over 17 million globally (1).

The rapid increase in the number of COVID -19 patients, especially those who presented clinically as critically ill, forced health professionals to perform in a unique environment with alternate and new patient management methods (1). The World Health Organization (WHO) declared COVID-19 a public health emergency in January 2020 (2). This was followed by countries implementing rapid responses of quarantining communities, closing schools, social and physical distancing, and isolation, all of which abruptly changed citizens' daily lives globally (3). The rapid adjustment had a concomitant effect on health professionals and health delivery because the rapid spread of this disease and the severity of symptoms pushed many countries to the limits of their health care systems. Health professionals managing patients with COVID-19 experienced a lack of personal protective equipment (PPE), the surge of critically ill patients requiring intensive care unit (ICU) beds, and a shortage of ventilators (3). It is noted that the risks for spreading the virus and infection may also be highest at the beginning of an outbreak when healthcare professionals may not be familiar with or have adequate PPE. While facing these challenges, health professionals performed to their full potential under extraordinary circumstances because patients expect health professionals to provide health care based on their specialist training (3). The rapid surge in demand for healthcare services resulted into an increase rates of burnout across medical specialties, according to Wiederhold, Cipresso (4), Fred and Scheid (5), Liebenberg, Coetzee (6), healthcare workers in primary healthcare environment were at greatest risk, including pharmacist and others at the frontline of health care.

Other challenges for health professionals coping with societal shifts and emotional

stressors faced by patients while simultaneously facing a greater risk of exposure, extreme workloads, moral dilemmas, and a quickly evolving clinical environment differing from their usual practice (3). According to Kannampallil, Goss (7), in an American study, exposure to COVID-19 patients increased physician trainee stress and burnout compared to those not exposed to these patients.

COVID-19 is caused by the severe acute respiratory system coronavirus 2 (SARS-CoV-2) having a case fatality rate of 2-3%, with higher rates among patients with comorbidities and the elderly population (8). The disease can cause significant alveolar damage resulting in hypoxemic acute respiratory failure (ARF), requiring the use of mechanical ventilation in most patients (9,10).

Although the COVID-19 pandemic in Africa is several weeks behind Europe and Asia, the number of infections in Africa is escalating daily (11-13). Incidence varied between Africa countries, which reflects in variations in air travel volume and differences in testing for COVID-19 (14). Although countries in Africa are increasing their preparedness for COVID-19, the WHO points to substantial response capacity limitations (14,15). Many governments in Africa require support from international donors due to lack of infrastructure and to protect "frontline" healthcare professionals from spreading the virus. Mortality rates are high among healthcare professionals who become infected and are even higher in many parts of Africa, given the limited number of critical intensive care unit beds (16). Moreover, the large geographical distances between rural and urban areas pose practical difficulties in transferring health professionals from rural areas to secondary- or tertiary-level facilities in urban centers (17). Although evidence of the impact of certain non-communicable diseases, tuberculosis, and HIV on COVID-19 is not yet available (17-19), many healthcare professionals in Africa fall into the category of 'high-risk' groups for COVID-19 (17).

Nigeria, with a population of 206,139,589, accounts for 2.6% of cases in Africa and 0.02% of the global occurrence as of April 2nd, 2020 (2). Nigeria has 36 states and a federal capital territory. The first case of COVID-19 in Nigeria was confirmed on February 27th, 2020 (20). The virus had an incidence in more than 50 percent of the states in Nigeria, with Lagos and Abuja having the highest number of reported cases in Nigeria (21).

Following the COVID-19 pandemic, many countries implemented strict infection control measures and nationwide "lockdown." In Nigeria, the government implemented the "lockdown" by restricting movement and placing a ban on social gatherings in all states. Also, social distancing measures entailed physical distancing between a minimum of one and a half meters between individuals and restricting citizens and public transport to only emergency requirements. However, pandemics like COVID-19 have a vicious cycle because there is an increase in the demand for the services of health professionals in the aspects of palliative care (22). The expectation of effective and efficient health services is patients to get the best care by rapid response and new treatment methods when resources are over-stretched (23). However, the COVID-19 pandemic has a detrimental effect on health services, health delivery, and individuals' overall health.

"Frontline" health professionals are usually those in first or direct contact with patients or the community, such as doctors, nurses, and community health workers. However, for this study, we identified "essential" health professionals as those who interact directly with patients in clinical and hospital settings daily, i.e doctors, nurses, and physiotherapists. Additionally, these health professionals come into direct contact with patients infected with COVID-19 who attend health facilities with intensive care units during the pandemic. Therefore, these "essential" health professionals are required to play a role in identifying, containing, mitigating, and treating the symptoms of this disease. This includes implementing methods to reduce the transmission of COVID-19, initiating early identification strategies, and dealing with infected patients appropriately. However, the current novel Coronavirus has created panic among health professionals as they grapple with new experiences in the same way that other population groups do, thereby creating challenges for health delivery (23). The virus has forced health professionals to review their daily provision of health services, delivery, and the need to ensure patients' sustained care and welfare. Therefore, this study was carried out with the primary aim of determining the challenges of COVID-19 on selected health professionals during the "lockdown" especially with respect to social distancing and movement restrictions following COVID-19 in Nigeria and to offer ways to alleviate some of the challenges

posed by this virus.

## **MATERIALS AND METHODS**

### **Study design and participants**

This cross-sectional descriptive survey was conducted in May 2020. The "essential" health professionals selected were those usually in direct contact with patients, viz. doctors, nurses, physiotherapists, and those who may not necessarily be in direct contacts like pharmacists and laboratory technicians. Healthcare professionals working in the private or public health sector and registered with their respective regulatory bodies gave consent to participate in the study. The Medical Rehabilitation and Therapist Board of Nigeria (MRTB), Association of Medical Laboratory Scientists of Nigeria (AMLSN), National Association of Nigeria Nurses and Midwives (NANNM), Pharmaceutical Society of Nigeria (PSN), and Nigeria Medical Association (NMA) approved the use of their databases to send the survey link to their membership.

The study sample was determined using the data from human resources for health (HRH) in Africa, with an estimated 1.95 health workers per 1000 population for essential health care services in Nigeria (24). Using a population estimate of 206 million individuals in Nigeria (25), approximately 401,700 health care workers are likely to be available for essential healthcare services in Nigeria. The sample size of 599 was determined with a population of 401,700 health care workers, a confidence level of 95%, and a confidence interval of 4 using a survey system, an online sample size calculator (26).

This study was approved by the Biomedical Research Ethics Committee of the University of KwaZulu Natal, Durban, South Africa, with approval number BREC/00001883/2020.

### **Questionnaire development**

A structured self-administered online questionnaire was used to obtain data from the study respondents (McLeod 2018). Since there were no available previous studies on this topic, the researchers used 'SurveyMonkey', an online software tool, to design a questionnaire based on the study's aims and literature review. This software tool provides customizable surveys and a suite of paid back-end programmes that include data analysis, sample selection, bias elimination, and data presentations. The researchers ensured validity and reliability of the questionnaire's content by consultation with health professionals



and academics as prescribed by Huijbregts (27). This was achieved by having the draft questionnaire reviewed by three social scientists followed by an online pilot survey to 10 health professionals from a hospital not used in the final study. After that, suggestions and changes were made with the final questionnaire having three sections with semi-structured open- and closed-ended questions to evaluate participants' challenges and suggestions. These were presented as first and second sections having inquiries related to demographic data, professional identity, and sector of practice. The third section contained open questions to explore suggestions to improve health delivery during the pandemic qualitatively.

### Procedure

The Dillman DA (28) method was used, which required pre-notice information and a cover letter informing the health professionals about the web link and how to access the study. The pre-notification was used to avoid the risk of nonresponse and tell that the survey date's closure was 31<sup>st</sup> May 2020. The survey software ensured respondents' anonymity, and they could only access the questionnaire if they responded "yes" to informed consent. Only the researchers had access to the data, which was dated and stored in a folder on a computer with password protection under lock and key in the researcher's office. All paper-related data were shredded after being recorded with electronic data to be deleted after five years.

### Data analysis

Questionnaire responses were downloaded from Survey Monkey as raw data to Microsoft Excel Data. The quantitative data were evaluated using SPSS version 26.0 software, and "open-ended" comments analyzed using counts aggregated into themes. Descriptive statistics with frequencies and percentages were used to summarize the data obtained while a chi-square goodness of fit test was used to show the effect of demographic status on challenges encountered while rendering vices during the lock down period.

### RESULTS

From the 599 questionnaires distributed, the response rate was 78% (481 respondents). Responses were from physiotherapists (n=108, 23%); nurses (n=106, 22%); doctors (n=86, 18%); laboratory technicians (n=87, 18%) and pharmacists (n=94, 19%). Majority of the

respondents' ages ranged 25 to 44 (n=335, 71%) with females constituting (n=272, 57%) (Table 1). Public hospital practitioners were (n=312, 66%) and private practice (n=163, 34%). The average time to complete the survey was 2 minutes 54 seconds. All health professionals' income in private practice decreased significantly compared to those in public hospitals (Table 1). During the study period, patients interacting with doctors, nurses, and physiotherapists in private practice decreased, whereas laboratory technicians experienced an increase in their patient numbers by 12% and pharmacists by 68%. (Table 2). Sixty-eight percent of the pharmacists practiced social distancing with a practicability score of >5. It did not affect their patient interactions, whereas 24% of the physiotherapists recorded the least social distancing practicability score of < 5 (Figure 1). Telehealth was used the most by doctors (n=42, 49%) and physiotherapists (n=50, 46.3%), with laboratory technicians (n=9, 10%) using this facility the least. The open-ended questions were themed with the following summary (Table 3).

Four hundred and twenty-eight (89%) of the participants experienced mental stress and anxiety with 99 nurses (93%); 101 physiotherapists (94%); 69 doctors (80%) 76 laboratory technicians (87%); 83 pharmacists (88%). One hundred and seventy-six (37%) required psychological support as follows - 48 nurses (45%); 64 physiotherapists (59%); 36 doctors (42%); 16 Laboratory technicians (18%); 12 pharmacists (13%). Fear of getting infected was indicated by 333 respondents (69%) which was -nurses 101(95%); physiotherapists 98 (91%); doctors 69 (80%); laboratory technicians 26 (30%) and pharmacists 39 (41%). Two hundred and thirty two (48%) feared transmitting the Coronavirus to their family members - nurses 83 (78%) ; physiotherapists 69 (64%); doctors 33 (38%); laboratory technicians 19 (22%) and pharmacists 28 (30%).

About two-thirds of the respondents 307 (64 %) indicated challenges with personal protection equipment with Nurses 98 (92%); physiotherapists 83 (77%); doctors 69 (80%); laboratory technicians 38 (44%) and Pharmacists 19 (20%).

Suggestions for improving health services during the COVID-19 pandemic were - alternate accommodation or longer shifts with fewer working days suggested by 111 (37%) as follows - nurses 59 (56%); physiotherapists 36 (33%); doctors 16 (19%); allowance over and above their salaries (referred to as hazard/

danger) allowance was suggested by 244 (51%) with - Nurses 83 (78%); physiotherapists 69 (64%); doctors 38 (55%); laboratory technicians 16 (18%) and pharmacists 38 (40%) with 238 (49%) requesting dedicated counseling services during the pandemic by - nurses 93 (88%); physiotherapists 56 (52%); doctors 38 (44%); laboratory technicians 22 (25%) and pharmacists 29 (31%).

## DISCUSSIONS

This study presents a cross-sectional survey of health professionals' challenges during the "lockdown," particularly to social distancing and movement restrictions following COVID-19 in Nigeria. Being an initial study, the researchers selected a sample of "essential" health professionals who interact in direct contact and those who may not necessarily interact in direct contact with patients. The rationale for selection was to determine if movement restrictions and social distancing during the "lockdown" affected patient interactions and health services. The reason governments globally introduced a "lockdown" and insisted that citizens stay at home was to ensure social distancing and minimize contact with each other as the Coronavirus was transmitted by droplets from the host (29). Social distancing is an effective non-medical intervention to prevent the rapid spread of epidemics (30-33). Other measures to stop transmission and slow the spread of the pandemic used by many countries were closing schools, prohibiting large gatherings, closure of non-essential stores, and limiting public transport (34,35). According to Koren and Peto (36) social distancing can be effective against epidemics but are potentially detrimental to the economy and services that rely on face-to-face communication or close physical proximity.

Health professionals requiring to interact in direct contact with patients when providing services will be affected, which will have a simultaneous effect on health delivery, health services, and individuals' overall health (36). Effective and efficient health services expect that patients receive the best care by rapid response and new treatment methods, especially when resources are over-stretched (23).

The data from this study shows that although social or physical distancing is simple to implement, it is affecting health professionals and health delivery because having social contacts between health professionals and their patients is an important component to administer the relevant modes of treatment; social distancing

between patients and administrative, cleaning staff, and health professionals may be challenging in busy, overcrowded primary health care clinics especially in third world countries with poor infrastructure (23). Nursing procedures are difficult to conduct when implementing social distancing due to nurses' frequent interactions with patients. The responses from health professionals in this study show that social distancing as a mitigating factor for Coronavirus transmission negatively affects efficient and effective health delivery. This will ultimately have a concomitant negative effect on the health of patients and individuals.

To overcome this mitigating factor, health professionals are using various strategies. Telemedicine, also referred to as telehealth, is one such method of electronic communication used to exchange medical information from one location to another, especially in Africa with a large rural population (37). The benefit of this exchange of information between health professionals is to exchange expert knowledge and information to improve the patient's health status. The health professionals in this study supported the use of telemedicine when denied direct access to their patients because it was used frequently by physiotherapists and doctors for patient and interprofessional engagement. The responses show that telemedicine was used frequently by physiotherapists in private hospitals as a tool to limit their physical contact with patients during physiotherapy sessions. In some instances, due to social distance they could not engage with patients. In Nigeria, nurses have direct patient contact when carrying out routine patient management, e.g., drug administration, infusions, etc. The researchers postulate that, unlike physiotherapists and doctors, nursing procedures are difficult to conduct through telemedicine which is possibly why nurses in this study did not often engage in telemedicine as reflected by their low score for social distancing. Further, it is suggested that the 'readiness' of stakeholders to engage in telemedicine can be assessed on a variety of levels and should not be limited to stakeholders' willingness to engage but also their ability to engage through the availability of necessary technology and alignment with organizational strategic plans (Alami, Gagnon (37), Theodors, Hill (38)). This study supports telemedicine as a beneficial way to engage with patients and individuals during a pandemic, especially if physical distancing and non-contact are enforced. Telemedicine also allows national or international experts to give

advice from a distance and support newly qualified or inexperienced health professionals. This will reinforce health care and individuals' health as a means of virtual service delivery and mitigate the social distancing and direct contact that is not possible during a "lockdown". Also, Nigeria has a good telecommunication infrastructure as post-Ebola outbreak, the Nigerian Communications Commission increased the number of telecommunication lines by over 45 million from 2014 to 2019. This enabled more Nigerians access to mobile communications making telemedicine an important tool for engaging health professionals and patients. The authors of this study support telemedicine, which holds promise as it rationalizes human resources and reduces patient contact and thus infection risks.

Although this study was conducted during the pandemic's initial period, the number of patients marking consultation was reduced for most professionals, which could be due to three factors. The first being that during the "lockdown," transport to health professionals was minimized to emergency services only (20). Even in these instances during consultations, patients were required to sanitize their hands, record the temperature, and record their symptoms. Secondly, social distancing required a larger floor space requiring some patients to wait outside of the hospital, clinical sites or consultation rooms often exposed to the hot weather as noted by AlDossary, Martin-Khan (39) which would have a negative impact on general healthcare services. Thirdly some patients were either cautious or avoided attending surgeries, clinics and hospitals as they perceived these to be the epicenter for COVID-19. Therefore, during the "lockdown" patients may have been reluctant to access health services even though they may have required these services. This may possibly have been the reason for a decrease for physiotherapy services during the "lockdown". However this was in contrast to the study by Downar J (41) who reported an increase in the number of patients requiring physiotherapy services during pandemics as a triage system requiring palliative care for those denied critical care.

There was also a significant decrease in income for health professionals in private practice. The researchers are of the view that this may have been because private-sector health professionals in Nigeria have their conditions of service and remuneration based on the basic conditions of employment act. This act prescribes

that remuneration for health services is generally determined by patients, medical aid schemes and private hospital remuneration based solely as a function of patients and volume of work outputs. The public sector health professionals in contrast are remunerated on a monthly basis with a fixed salary irrespective of the number of patients or work outputs. The results from this study is supported by Ekere and Amah (2014) where they showed that the income of public health professionals was not affected because in most countries public sector health professionals have their conditions of employment and remuneration based on public-service policy set by the State. Additionally, the income of physiotherapists in private practice, compared to other professionals in private practice was found to be much lower. This could have been as a result that only emergency services were allowed during the "lockdown" and some patients may not have regarded physiotherapy as an emergency requirement. Alternatively, there was an increase in the number of patients receiving services from pharmacists and laboratory technicians as compared to other health professionals. The authors postulate that this increase in patients may be due to those requiring their chronic medication or medication for signs of infection or for those having symptoms of the virus requiring tests which increased the demand for the services of these professionals respectively. It is worth noting that the strain at work is compounded by the disruptions and uncertainties felt by members of the general population during a pandemic (42).

Securing the mental wellbeing of healthcare professionals who deliver health services for patients with COVID-19 disease results in considerable mental stress, leading to high levels of anxiety and post-traumatic stress disorders, especially among nurses (43). Currently, the impact of HIV/AIDS and tuberculosis has placed an additional burden on public health therapists within an over-burdened and under-resourced public health system with health professionals also experiencing an overwhelming fear for their health by getting infected or spreading the infection to their family members (44,45). While healthcare professionals accept an increased risk of infection as part of their chosen profession, they tend to have a considerable anxiety about talking about the virus to their children, families and friends, especially with the elderly or those with chronic medical conditions (46-47). Female health professionals in particular have to juggle home-schooling, work overtime and do household



tasks, which potentially can undermine their decision-making ability and quality of interaction with patients (48). These may have been compounding issues in this study as a predominantly large proportion of respondents were females mainly from the nursing and physiotherapy professions which is the common gender for these professionals in Nigeria (49-50).

Psychological support is key, perhaps as was done with HIV/AIDS in the African continent where utilizing the large numbers of HIV counsellors or retired nurses to counsel health professionals had an ameliorating effect on health care professionals (51). Given the competing priorities of health staff, formal structured interventions, however, may encounter obstacles, (52). Informal mechanisms might be more successful, where counsellors or retired nurses visit healthcare workers to counsel them. Also support through social media like the Vula platform which when conducted in South Africa relieved stress, this method could be extended to other countries (52).

Based on the above mental stressors and high risk imposed by COVID-19, health professionals in this study suggested a hazard allowance or health insurance to "essential" health professionals during the pandemic.

Respondents in this study also suggested that other mitigating factors for the spread of COVID-19 such as basic hand hygiene and use of personal protective equipment (PPE) such as gloves, masks, gowns and goggles form the foundation of infection control which will enable health professionals to treat patients with communicable diseases while protecting themselves and others.

In this study a high percentage of nurses preferred alternative accommodation to avoid the risk of household transmission. This was successful in some countries where student residences or hotels that were empty were repurposed to serve as places where health professionals could rest and temporarily isolate themselves from their family (52). The authors also noted that this study showed support for an alternate way to mitigate home transmission is that health professionals increase hours of their shifts which will allow them more days off as compared to shorter shifts and returning home each night.

Considering the costs in setting up some of the suggestions listed above, investing in PPE, and staff resources may improve patient outcomes.

## CONCLUSION

Majority of the health professionals who participated in this study were employed in the tertiary healthcare facility which managed almost a third of all patients treated during the pandemic. "Essential" health professionals who are in close or direct contact with patients were the most affected by social distancing. Restricted transportation by public transport and other social services may have affected health delivery contributing to ineffective health services during the "lockdown". Health professionals employed in the private sector reported a significant decrease in their income during the pandemic. Telemedicine can be beneficial during a pandemic, especially if non-contact is enforced as it is an ideal tool as a means of virtual health service delivery and mitigates the social distancing and direct contact that is not possible during a "lockdown." It will ensure an effective and efficient health service delivery and health of individuals in the absence of direct contact during the "lockdown" between health professionals and patients.

The health professionals surveyed in this study suggested a hazard allowance, alternate accommodation and health insurance be provided to all "frontline" health professionals during the pandemic. Health professionals suggested a monetary allowance over and above their salary, alternate accommodation and health insurance for to all "essential" health professionals during the pandemic.

**Limitations of the study:** The authors concede that the majority of the respondents were from the south-western part of Nigeria and the result of the survey may not be generalized across all the regions of the country. The sample were selected "essential" health professionals and may not necessarily be the view of all health professionals in the region. Finally, although the blinded technique was used to disseminate the questionnaires the acute nature of the COVID-19 pandemic, complete closure of most health institutions and the inability to access the internet in some regions could have been an additional limitation to this study.

**Availability of data and materials:** The datasets used during the current study are available from the corresponding author on request. The findings from the study would be made available to participating researchers as required by law.

**Conflict of interests:** The authors declared that



they have no competing interests. The views expressed in this study are strictly the views of the authors and not of the institution or any other group of people.

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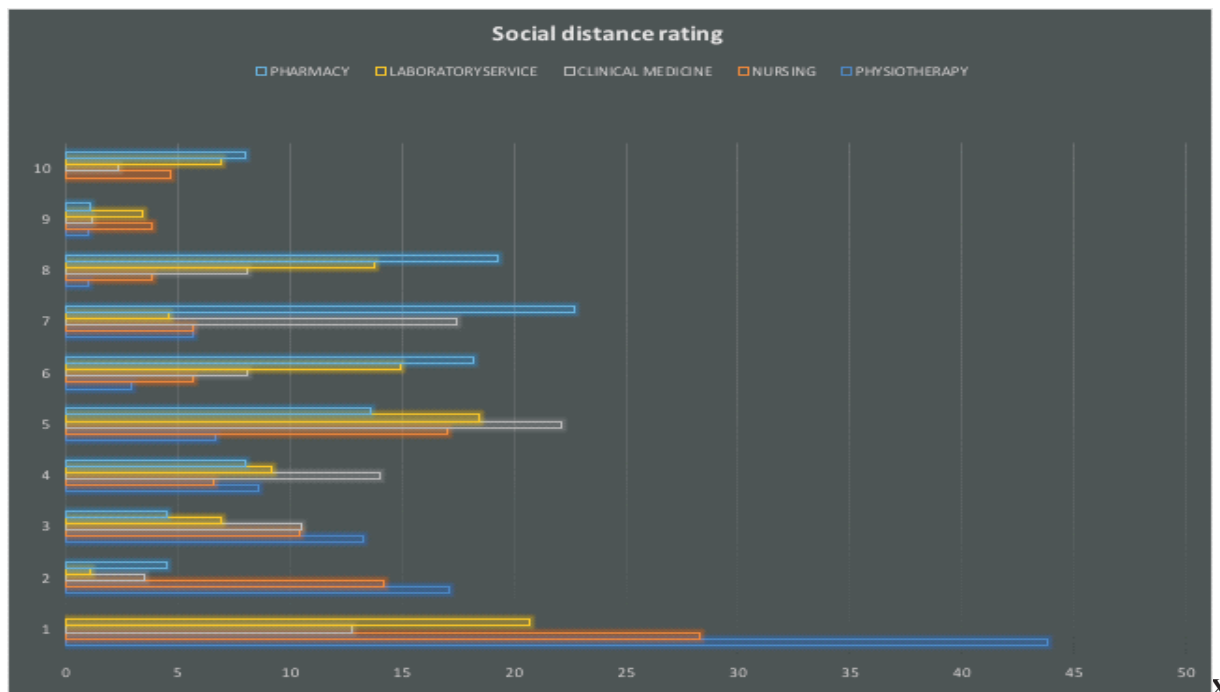
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Table 1: Demographic characteristics of participants

Demographic characteristics	Physiotherapists	Nurses	Medical doctors	Laboratory technician	Pharmacists	Total	p-value
<b>AGE</b>							
18-24	11 (10.2%)	10 (9.4%)	1 (1.1%)	11 (12.6%)	28 (29.5%)	61 (12.7%)	0.348
25-34	52 (48.1%)	36 (34%)	22 (25.6%)	36 (41.4%)	44 (46.6%)	190 (39.5%)	
35-44	31 (28.7%)	33 (30.2%)	37 (43%)	29 (33.3%)	20 (21.6%)	150 (31.2%)	
45-54	13 (12.1%)	21 (19.8%)	15 (18.6%)	9 (10.3%)	2 (2.3%)	60 (12.5%)	
55-64	1 (0.9%)	6 (6.6%)	9 (10.5%)	1 (1.2%)	0 (0.0%)	17 (3.5%)	
65-74	0 (0.0%)	0 (0.0%)	2 (1.2%)	1 (1.2%)	0 (0.0%)	3 (0.6%)	
<b>Mean ± SD</b>	<b>34.2±8.4</b>	<b>34.8± 10.6</b>	<b>42.9±10.5</b>	<b>42.4±12.1</b>	<b>39.3±12.1</b>		
<b>GENDER</b>							
FEMALE	44 (40.7%)	93 (87.7%)	29 (33.7%)	56 (64.4%)	51 (54.3%)	273 (56.8%)	0.157
MALE	64 (59.3%)	13 (12.3%)	57 (66.3%)	31 (35.6%)	43 (45.7%)	208 (43.2%)	
<b>PRACTICE SECTOR</b>							
PRIVATE	44 (40.7%)	17 (16%)	25 (29.1%)	35 (40.2%)	42 (44.7%)	163 (34%)	
PUBLIC	64 (59.3%)	89 (84%)	61 (70.9%)	52 (59.8%)	52 (55.3%)	318 (66%)	
<b>TELEMEDICINE</b>							
Utilization	50 (46.3%)	8 (7.5%)	42 (48.8%)	15 (17.2%)	28 (29.8%)	143 (29.7%)	
Non-utilization	58 (53.7%)	98 (92.5%)	44 (51.2%)	72 (82.8%)	66 (70.2%)	338 (70.3%)	
<b>INCOME AFFECTED</b>							
PRIVATE	43 (98%)	9 (50%)	19 (76%)	28 (80%)	34 (81%)	133 (40.8%)	0.043*
PUBLIC	44 (68.8%)	55 (61.5%)	36 (59.3%)	34 (65.4%)	24 (45.7%)	193 (59.2%)	

\*Significant at  $p < 0.05$ . We evaluated the gender distribution of all participants across various healthcare practices, we observed a predominance of the feminine gender in all healthcare practices with the exception of medical doctors and physiotherapy. There was a marked difference in the female to male ratio of nursing services with an approximate ratio of 7:1 respectively. Majority of the healthcare workers that responded to the survey were between the age of 25-34, and 35-44



Key: X=Practicability score (1-Least practicable, 10-Most practicable), Y=Number of respondents

Fig.1. Social distancing practicability.

Table 2. Number of patients seen by selected professional cadre during and before movement restriction by federal government of nigeria.

HEALTH SERVICES	DURING RESTRICTION	BEFORE RESTRICTION	PERCENTAGE DIFFERENCE	REMARK
Physiotherapy	353	470	-31.06%	Reduction
Nursing	234	318	-26.40%	Reduction
Medical doctors	196	246	-20.30%	Reduction
Laboratoryservice	310	277	11.91%	Increase*
Pharmacy	234	139	68.35%	Increase*
<b>Total</b>	<b>1327</b>	<b>1450</b>		

Relationship between various health care practitioners and patients seen before and during the movement restrictions initiated by FGN.

We evaluated the relationship between various health care practitioners and patient seen before and during movement restriction by comparing the total number of patients seen before and after movement restriction across all health care practices. Laboratory and Pharmaceutical healthcare services revealed an increase of 11.91% and 68.35% respectively during the pandemics while others showed a decrease in attendance.



Table 3: Challenges and Suggestions for Health delivery during COVID-19

	PHYSIOTHERAPY (n=108)	NURSES (n=106)	DOCTOR S (n=86)	LABORATORY TECHNICIANS (n=87)	PHARMACIST (n=94)	TOTAL
<b>CHALLENGES</b>						
Mental Stress	101 (94%)	99 (93%)	69 (80%)	76 (87%)	83 (88%)	428 (89%)
Require psychological support	64 (59%)	48 (45%)	36 (42%)	16 (18%)	12 (13%)	176 (37%)
Fear of getting infected	98 (91%)	101 (95%)	69 (80%)	26 (30%)	39 (41%)	333 (69%)
Fear of Transmitting to family	28 (26%)	83 (78%)	69 (80%)	33 (38%)	19 (20%)	232 (48%)
Personal Protective equipment	83 (77%)	98 (92%)	69 (80%)	38 (44%)	19 (20%)	307 (64%)
<b>SUGGESTIONS</b>						
Alternate accommodation close to the Hospital	36 (33%)	59 (56%)	16 (19%)	nil	nil	111(37%)
upward review of Hazard allowance	69 (64%)	83 (78%)	38 (44%)	16 (18%)	38 (40%)	244 (51%)
Dedicated counselling services on Pandemics	56 (52%)	93 (88%)	38 (44%)	22 (25%)	29 (31%)	238 (49%)