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VOICES FROM THE FRONTLINE: EXPLORING THE RISK EXPOSURE AMONG FRONTLINE HEALTH WORKERS DURING THE COVID-19 PANDEMIC IN NIGERIA

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ABSTRACT

Frontline health workers (FHWs) in Nigeria faced substantial risk exposure during the COVID-19 pandemic, yet their lived experiences and challenges remain insufficiently documented. This qualitative study explored the risk exposure and associated systemic challenges encountered by FHWs in Nigeria amidst the COVID-19 pandemic. A total of 100 frontline health workers (doctors, nurses, lab scientists and clinical psychologists) were purposively recruited, comprising 60% males and 40% females, who provided rich accounts of their experiences through semi-structured interviews. Data were analysed using thematic analysis, revealing three major themes: (1) FHWs contract COVID-19 from patients, highlighting inadequate patient screening procedures, lack of isolation facilities, and delayed test results that increased unintentional exposure; (2) High rate of COVID-19 infection among FHWs, capturing the frequent illness among colleagues, emotional and physical burnout, and pervasive fear and anxiety within healthcare settings; and (3) Lack of personal protective equipment (PPE), emphasizing shortages, poor quality, and delayed distribution of essential protective gear that compromised workplace safety. The study revealed the systemic lapses and operational challenges that not only heightened infection risks but also adversely affected the psychological well-being and morale of health workers. Findings point to urgent policy and resource interventions aimed at strengthening infection control measures and safeguarding the health and welfare of frontline health workers during ongoing and future pandemics.

Keywords: *Frontline Health Workers, Risk exposure, COVID-19 pandemic*

INTRODUCTION

The outbreak of COVID-19 quickly turned into a global health crisis, prompting the World Health Organisation to declare it a pandemic in March 2020. This situation notably disrupted global socio-economic systems and placed immense pressure on healthcare infrastructures around the world (Abdelouahed et al., 2025; Nasim et al., 2023). Frontline health workers (FHWs), which include medical professionals, nurses, lab personnel, paramedics, support staff, and public health officials, played a crucial role in responding to the crisis by diagnosing, treating, and managing the virus's spread (Awolola & Maharaj, 2023; Krishnan, 2022). However, their essential duties exposed FHWs to increased and varied risks, adversely affecting their physical, psychological, emotional, ethical, and socio-economic health (Ansari & Pub, 2021; Dadashzadeh et al., 2025; Rahman et al., 2025). Health workers were often directly exposed to SARS-CoV-2 through patient interactions, a risk heightened by inadequate personal protective equipment, inconsistent policies, and existing systemic problems. These issues were particularly acute in low- and middle-income nations such as Nigeria, where established healthcare deficiencies like underfunding, staffing shortages, subpar occupational health standards, and erratic policies severely impeded an effective response to the pandemic (Alajlan, 2024; Okereke et al., 2021). The combination of these institutional weaknesses and the pandemic's severity significantly escalated the risks for Nigerian FHWs, highlighting them as an especially vulnerable group during this health crisis.

Globally, approximately 115,000 healthcare workers lost their lives due to COVID-19 complications between January 2020 and May 2021 (WHO, 2021). In Nigeria, the safety of frontline health workers (FHWs) was severely threatened by critical shortages of personal protective equipment (PPE), slow governmental responses, and inadequate hazard pay (Adebanjo, 2024; Bello et al., 2024; Mary, 2023). Although PPE is essential for infection prevention, many Nigerian health workers ended up improvising with items like plastic bags and raincoats in the early days of the pandemic due to significant supply shortages (Abubakar et al., 2023; Mary, 2023; Oladele et al., 2021). This situation reflects broader systemic issues in various African countries, where limited healthcare funding and fragmented public health governance left frontline workers particularly vulnerable to workplace hazards (Fronteira et al., 2024; Ngoy et al., 2022). Additionally, the threats faced by FHWs extended beyond viral exposure; the intense emotional and psychological challenges arising from demanding work conditions, constant fear of infection, and frequent encounters with patient suffering and death severely affected their mental health (Becerra-Medina et al., 2022; Umbetkulova et al., 2024).

Research has indicated widespread issues such as depression, anxiety, insomnia, and post-traumatic stress affecting health workers globally (Alharbi et al., 2025; Hassanie et al., 2024; Nguyen et al., 2025). In Nigeria, these systemic issues were worsened by inadequate mental health services and a lack of institutional psychosocial support (Amodu et al., 2024; Onyemaechi et al., 2025). Furthermore, frontline health workers faced stigma and discrimination, particularly in African communal societies where individuals with infections or suspected infections were often ostracised and marginalised (Angwenyi et al., 2023; Kwaghe et al., 2021). This phenomenon, often referred to as "secondary trauma," illustrates the distinctive emotional burdens experienced by those dealing with the crisis. Additionally, Nigeria's fragmented policy frameworks led to inconsistent enforcement of health policies across states, hindering the safeguarding of frontline health workers. Although the NCDC worked on communication and coordination, unequal access to personal protective equipment (PPE), insufficient organisation of infection control training, and inadequate risk allowances- especially in under-resourced areas- placed many health workers at risk (Onyemaechi et al., 2025; Nguyen et al., 2025).

Present Study

The COVID-19 pandemic severely impacted frontline health workers (FHWs) globally, particularly in low- and middle-income countries (LMICs) like Nigeria, by exposing them to significant physical, psychological, and social risks that strained healthcare systems. FHWs faced considerable occupational hazards, including inadequate personal protective equipment (PPE), high infection rates, and profound psychosocial stressors such as burnout, anxiety, and societal stigma (Billings et al., 2021; Shah et al., 2022; Adebanjo, 2024). Past studies on COVID-19 have highlighted the widespread psychological toll on healthcare workers worldwide, revealing elevated rates of anxiety, depression, and insomnia during the pandemic (Abiola et al., 2024; Hester et al., 2025; Yang et al., 2025). However, there's limited research specifically addressing the heightened vulnerabilities of Nigerian health workers during this period. The few existing studies point to systemic weaknesses in Nigeria's healthcare system, including poor infrastructure, fragmented governance, and insufficient mental health support (Bello et al., 2024; Nosike & Nosike, 2024). Despite the acknowledged importance of PPE and occupational safety (Oladele et al., 2021; OJo et al., 2022; Okonkwo, et al., 2025), challenges like improvised protective measures and inconsistent hazard allowances exacerbated risks for health workers. Additionally, ethical dilemmas, such as the fear of transmitting the virus to family members and grappling with resource scarcity, have not been adequately explored in Nigeria. This critical gap in our understanding highlights a pressing need for in-depth research to truly grasp the complex risks Nigerian frontline workers face. This study is crucial for informing and guiding targeted interventions to improve their safety, mental health, and overall well-being, not just now, but in any future health crises. This study's research question focuses

on the actual risk exposure for frontline health workers in Nigeria during the COVID-19 pandemic.

Protection Motivation Theory (PMT)

Protection Motivation Theory (PMT), developed by Rogers (1975), provides a framework for understanding how individuals respond to perceived threats. It posits that those protective behaviours stem from two core appraisals: threat appraisal (evaluating threat severity and personal vulnerability) and coping appraisal (assessing the efficacy of protective actions and one's self-efficacy to perform them) (Rogers, 1975; Floyd, et al., 2000). These appraisals collectively shape adaptive or maladaptive responses. For frontline health workers (FHWs), constant exposure to infectious pathogens heightens threat appraisal, necessitating effective coping. According to PMT, when FHWs perceive COVID-19 as a significant threat and recognise their susceptibility, they are more inclined to adopt protective behaviours like consistent PPE use, adherence to infection protocols, and seeking psychological support (Hinssen & Dohle, 2023; Mortada et al., 2021). However, this depends on their belief in the effectiveness of these measures and their confidence in implementing them (coping appraisal). Inadequate resources, systemic inefficiencies, and psychological distress can undermine coping appraisal, leading to reduced adherence to protective behaviours or maladaptive strategies (Maddux & Rogers, 1983; Mortada et al., 2021). In Nigeria, where infrastructural deficits, PPE shortages, and fragmented governance were prevalent during the pandemic (Okeke et al., 2025; Adebanjo, 2024), PMT offers a critical lens to examine FHWs' multifactorial risk exposures. The gap between high perceived threat and limited coping resources can result in increased psychological distress, burnout, and compromised adherence, escalating vulnerability to infection and adverse mental health outcomes (Nguyen et al., 2025). This theory emphasises the need to enhance both protective resources and psychosocial support for FHWs to foster adaptive motivation.

METHODS

Study Design

This study adopted an exploratory descriptive qualitative design rooted in the interpretivist paradigm, which is concerned with understanding the subjective meanings and lived experiences of participants. In-depth, semi-structured interviews and focus group discussions were conducted to explore how frontline healthcare workers perceived, managed, and coped with their risk exposure during the COVID-19 pandemic in Nigeria. The study sought to uncover the emotional, psychological, and professional realities faced by these workers, as well as their adaptive strategies and interpretations of institutional support. This approach was particularly suitable for capturing the context-dependent experiences of healthcare professionals operating in high-pressure, resource-constrained environments during a national health emergency.

Study Setting

The study was conducted across six Nigerian states, representing each of the six geopolitical zones to capture diverse frontline experiences across the country. The selected states included Lagos State (South-West), Rivers State (South-South), Ebonyi State (South-East), Plateau State (North-Central), Bauchi State (North-East), and the Federal Capital Territory, Abuja (North-West). These states were purposively chosen based on their COVID-19 caseloads, treatment capacity, and strategic role in the national pandemic response. Lagos State, identified as the epicentre of the outbreak in Nigeria, served as a focal point for understanding frontline exposure in high-burden urban environments. Each selected state had at least one designated COVID-19 treatment centre or isolation unit, established based on national response protocols and lessons from the 2014 Ebola epidemic. These centres were

physically and operationally distinct from regular healthcare services to minimise cross-infection and ensure continuity of essential health services. Frontline healthcare workers, including doctors, nurses, laboratory scientists, clinical psychologists and support staff who provided direct care to COVID-19 patients, were recruited as participants. Their experiences offered rich insights into occupational hazards, resource limitations, emotional and psychological tolls, and institutional support mechanisms during the pandemic. The multi-site nature of this study provided a comprehensive understanding of risk exposure across urban and semi-urban treatment facilities in Nigeria.

Population and Sampling Approach

The study population comprised frontline healthcare workers (FHWs) directly involved in the care and management of COVID-19 patients at six designated treatment centres across Nigeria. These included doctors, nurses, laboratory scientists, clinical psychologists, and other essential healthcare professionals who played active roles during the pandemic response. Participants were drawn from facilities located in Lagos, Rivers, Ebonyi, Plateau, Bauchi, and the Federal Capital Territory (Abuja), reflecting Nigeria's six geopolitical zones. All participants had prior experience working during the 2014 Ebola outbreak and were involved in managing patients during the peak of the COVID-19 pandemic.

A total of one hundred 100 FHWs participated in the study through a combination of Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs). The sample included 60 males and 40 females, aged between 20 and 67 years, with varying levels of experience and professional responsibilities. FGDs were used to facilitate shared narratives and collective reflections on systemic risk, protective practices, emotional burden, and institutional support. KIIs were conducted to gain deeper insights into individual experiences, especially regarding exposure risk, psychological strain, and coping mechanisms during the pandemic. A purposive sampling approach was adopted to ensure a diverse representation across professional roles, gender, cadre, and years of experience. Participants were recruited through their institutional heads and national/state COVID-19 response units, which enabled easy identification and access to eligible individuals. Recruitment was guided by inclusion criteria that required direct involvement in COVID-19 patient care and prior experience in epidemic response. Those who were administrative staff or did not engage in direct clinical service were excluded. Sampling continued until thematic saturation was reached, ensuring that the narratives collected were rich, comprehensive, and reflective of frontline realities across the nation's healthcare spectrum.

Data Collection

Before data collection, ethical approval was obtained from the institutional ethics committees of all six participating states—Lagos, Rivers, Ebonyi, Plateau, Bauchi, and the Federal Capital Territory (Abuja). Each approval was specific to the COVID-19 treatment facilities in the respective state, ensuring that the research adhered to local ethical standards and protocols. Access to the study sites was granted by the NCDC administrative heads of the designated treatment centres and state-level health authorities overseeing the COVID-19 response. All participants were provided with a detailed information sheet outlining the study's objectives, procedures, risks, and benefits, as well as their rights to voluntary participation, confidentiality, and withdrawal without consequence. Informed consent was obtained from each participant before data collection, with verbal and written consent procedures strictly followed to maintain ethical integrity. Data were collected using a semi-structured Key Informant Interview (KII) guide and a Focus Group Discussion (FGD) guide, both developed by the research team based on prior studies on infectious disease outbreaks and frontline exposure (including Ebola response literature). These instruments included open-ended questions designed to elicit in-depth accounts of risk exposure, coping mechanisms, workplace safety protocols, mental health challenges, and institutional support systems. Prompts and probes were included to encourage elaboration and personal reflections.

Participant recruitment and scheduling were coordinated through hospital administrators and heads of COVID-19 response units, who acted as gatekeepers. They identified eligible frontline health workers based on the inclusion criteria and helped introduce the study to potential participants. To minimise any potential bias or coercion, these gatekeepers received briefing sessions highlighting the voluntary nature of participation and ensuring that declining to participate would not affect job roles or professional relationships. Interviews and focus groups were conducted in person within the COVID-19 treatment centres, with adherence to strict infection prevention protocols, including mask use, physical distancing, and hand hygiene. Each interview lasted between 30 and 45 minutes, while FGDs ranged from 45 to 60 minutes, depending on group dynamics. Most participants consented to audio recordings, while a few preferred written documentations to preserve anonymity. In both cases, field notes were taken to capture non-verbal cues, environmental factors, and emotional responses to further enrich the qualitative data. Data collection was supported by the research team with public health backgrounds and prior experience in qualitative interviewing. They helped organise interview schedules, manage participant confidentiality, and document observational data. The entire data collection process adhered to the Consolidated Criteria for Reporting Qualitative Research (COREQ) (Tong et al., 2007), ensuring transparency, ethical compliance, and methodological rigour throughout the study.

Rigour and Reflexivity

Ensuring rigour in qualitative research is vital, especially when investigating complex and emotionally charged issues such as risk exposure and psychological distress among frontline healthcare workers. In this study, rigour was maintained through multiple strategies aimed at enhancing the trustworthiness, credibility, and transparency of the findings (Tobin & Begley, 2004). Triangulation was employed by gathering data from a diverse cadre of participants across six geopolitical zones in Nigeria, including doctors, nurses, laboratory scientists, clinical psychologists, and other frontline personnel. This variation in professional roles and geographical locations enriched the data and allowed for a holistic exploration of the phenomenon. The use of both Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) further enhanced data triangulation and deepened the understanding of shared and divergent experiences among participants. To strengthen credibility, the study employed member checking by sharing preliminary themes and coded transcripts with selected participants to verify the accuracy of interpretations and confirm that their experiences were faithfully represented. This process also reduced the influence of researcher bias and improved the authenticity of the findings.

The analysis was conducted using NVivo software, which provided a systematic platform for coding, organising, and managing data. Braun and Clarke's (2006) six-phase framework for thematic analysis guided the analytical process. The use of NVivo supported the development of a transparent audit trail, facilitated iterative code refinement, and ensured that themes were grounded in the raw data. Peer debriefing was carried out with a multidisciplinary research team, including experienced qualitative researchers, public health professionals, and clinical psychologists familiar with Nigeria's healthcare landscape. Their feedback helped challenge assumptions, offered alternative interpretations, and enhanced analytical depth. Reflexivity was rigorously maintained throughout the study. The lead researcher kept a reflexive journal to document personal insights, preconceptions, and emotional responses encountered during data collection and analysis. This practice supported critical self-awareness and helped mitigate the influence of the researcher's professional identity and past experiences, particularly as they related to healthcare work and emergency response. Additionally, the cultural and contextual sensitivity of the research was ensured through the involvement of a team familiar with the ethical, religious, and social implications of health risk discourse in Nigeria. The diverse team, comprising qualitative methodologists, Lecturers in Medicine and Psychology, and a lecturer in medical sociology, ensured that data interpretation was both contextually grounded and ethically sound. This multidimensional approach enhanced the

confirmability, dependability, and transferability of the research, providing a robust foundation for the study's conclusions.

RESULTS

Table 1: Socio-Demographic Table

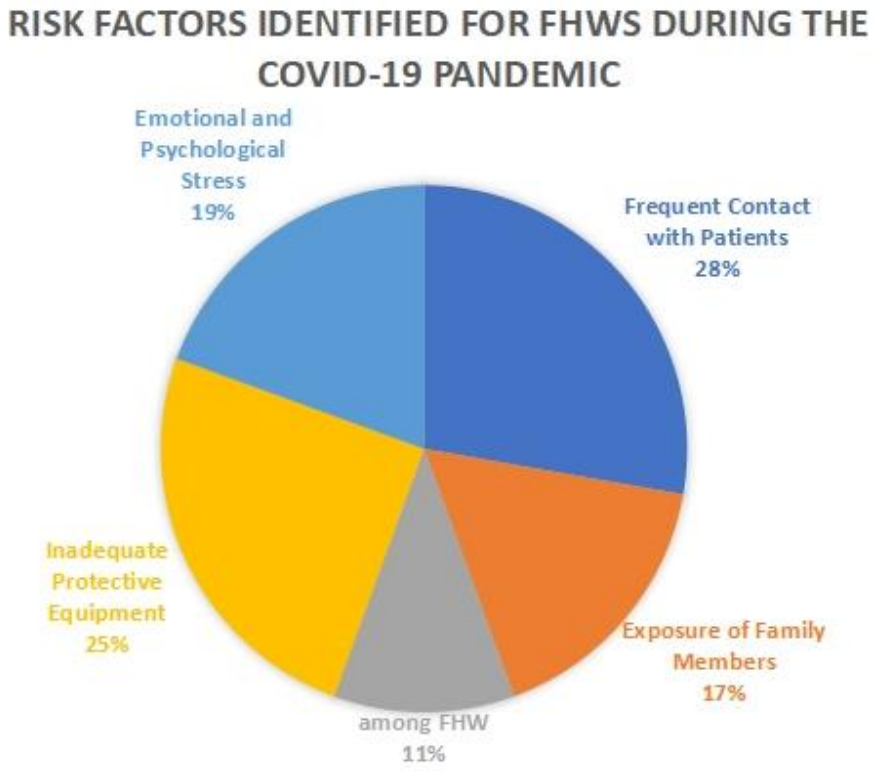
Variable	Category	Frequency	Percentage (%)
Gender	Male	60	60%
	Female	40	40%
Age	20-29	25	25%
	30-39	35	35%
	40-49	20	20%
	50-59	15	15%
	60+	5	5%
Professional Role	Doctors	40	40%
	Nurses	30	30%
	Lab Scientists	15	15%
	Clinical Psychologists	10	10%
	Other	5	5%

The gender distribution of the frontline health workers (FHWs) involved in this study was predominantly male (60%), with females making up 40% of the participants. This skewed gender ratio may reflect the gender dynamics within the healthcare sector in Nigeria, where certain roles, especially those perceived as more hazardous or physically demanding, might attract more male workers. The higher proportion of male FHWs could be attributed to societal norms and occupational structures within the healthcare system in Nigeria. Men might be more represented in roles such as doctors and lab scientists, which were crucial during the COVID-19 response. This gender distribution also impacts the perception and management of risks, as male workers might approach their duties differently compared to their female counterparts. The age distribution shows that a significant proportion of the FHWs were in the age group 30-39 (35%), followed by those aged 20-29 (25%), and 40-49 (20%). The older age groups, 50-59 and 60+, made up a smaller percentage of the workforce (15% and 5% respectively). The concentration of FHWs in the younger to middle-age brackets (20-49) indicates that a substantial portion of the workforce was relatively young. This age distribution suggests a dynamic workforce that is potentially more adaptable and physically resilient, essential traits during the high-stress environment of the COVID-19 pandemic. However, the younger age groups might also face higher psychological stress due to less experience in dealing with pandemics. The professional roles of the participants were primarily doctors (40%) and nurses (30%), followed by lab scientists (15%), clinical psychologists (10%), and other roles (5%). This distribution underscores the critical roles played by doctors and nurses during the pandemic.

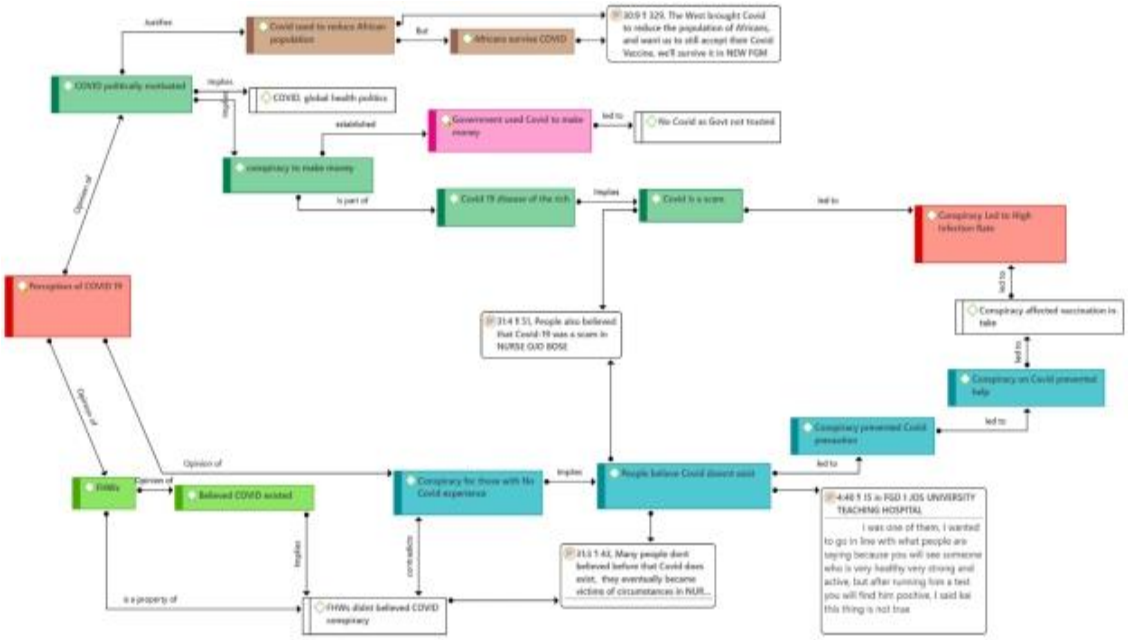
Table 2: Major Risk Factors Identified for FHWs during the COVID-19 pandemic

Theme	Sub-themes	Description
FHWs contract COVID-19 from patients	- Inadequate patient screening procedures - Lack of isolation facilities - Delayed test results	These reflect the systemic and procedural lapses that led to health workers unknowingly getting exposed to COVID-19 while attending to patients.
High rate of COVID-19 infection among FHWs	- Frequent illness among colleagues - Emotional and physical burnout - Fear and anxiety in the workplace	This emphasises the psychological toll and operational strain caused by widespread infections among staff, contributing to low morale and fear of infection.
Lack of Personal Protective Equipment (PPE)	- Shortage of essential PPE (masks, gloves) - Poor quality of PPE - Late distribution of PPE	These highlight challenges related to insufficient or delayed supply of protective gear, leading to unsafe working conditions for frontline workers.

The narratives surrounding these risk factors highlight the extreme challenges faced by FHWs during the COVID-19 pandemic in Nigeria. FHWs were constantly at high risk due to their frequent and unavoidable contact with COVID-19 patients. This direct contact not only increased their risk of contracting the virus but also posed a significant threat to their families, who were often inadvertently exposed to the virus brought home by the FHWs. The lack of adequate protective equipment (PPE) was a critical issue. Many FHWs had to work without proper protection, significantly increasing their susceptibility to infection. The narratives reveal that despite the high risk, FHWs remained dedicated to their duty, often prioritising patient care over their safety. These expanded tables, narratives, and additional interview snippets provide a comprehensive view of the risk and protective factors faced by FHWs during the COVID-19 pandemic in Nigeria, highlighting the severe challenges and the resilience of these essential workers.



From the qualitative data, the major risk factors that were peculiar to FHWs during the COVID-19 pandemic are as follows: FHWs' frequent contact with COVID-19 patients, high rate of COVID-19 infection among FHWs and family members of FHWs contracting COVID-19 through FHWs



FHWs contract COVID-19 from patients.

FHWs are in direct contact with patients with confirmed or suspected COVID-19 or with their biological sample; thus, these professionals are at higher risk of contagion. Moreover, FHWs have high-risk contacts because they work in a hospital or health centre may serve as a route of transmission to their relatives, despite not being infected; thus, some countries implemented confinement of health professionals in their workplace. COVID-19 has exposed FHWs and their families to unprecedented levels of risk. While carrying out their duties, HWs face the occupational risk of being infected or unknowingly infecting others. Although HWs represent less than 3% of the population in the large majority of countries and less than 2% in almost all low- and middle-income countries, around 14% of COVID-19 cases reported to the WHO are among FHWs.

FHWs are active change agents whose expertise has been shown to contribute to the protection of any given population against a viral epidemic. Due to frequent contact with COVID-19 patients, FHWs were at a very high risk of contacting COVID-19.

One of the respondents interviewed had this to say:

> When you were in contact with people you're working with them. Sometimes you might slip one way or the other and you get it. So it can be two pockets. And one way of contracting is contact with your patients and you cannot avoid them, you have to take care of your patients. *Medical Personnel*

The opinion of this participant shows that health workers contact Covid-19 while in contact with their patients who have positive case of Covid-19. Unfortunately FHWs cannot abandon their patients because of the fear of contacting Covid-19. Hence, this calls for provision of adequate personal protective equipment for all FHWs across all medical facilities in case of another pandemic.

A medical doctor who was interviewed had this say:

> Actually there are limits to reduce overcrowding because all of us will be in the same doctor's room, we have to treat COVID 19 patients you will definitely get it done some of us were notlucky it came down with COVID-19 treating patients. The process of treating positive patients is deadly, and anybody can get infected whether you are medical doctor or not everybody is risk. *Male Medical Doctor*

The above assertion of the medical doctor shows that the room where Covid-19 patients are treated as congested and crowded because of the team work and synergy required to treat Covid-19 patients, several doctors and nurses comes together, hence the vulnerability of FHWs in contacting Covid-19. Unfortunately, he opined that several of FHWs contacting Covid-19 in the process of treating Covid-19 patients. This further implies that FHWs are not immune to contacting Covid-19 or any other virus, hence the need to provide special protective equipment for them.

This was a direct response from a female participant:

> You cannot leave the hospital when your patient is in oxygen. And apart from that, I personally don't feel comfortable leaving without seeing the patient first in the morning and last in the evening, because I knew my subordinates might not be able to see what I was seeing. So that makes it more stressful. So when the pandemic now, with the onset of the pandemic, it was more juggling, because now we needed to make a lot of additional protocols, additional universal precautions, if I will be we had those children in the past cautions because it was a new disease, and everybody was scared. *Female Nurse/IDI*

This shows that most FHWs are compassionate about their Covid-19 patients and risks their own lives to ensure that their patients are treated and in so doing are at risks of contacting of Covid-19 because of exposure to Covid-19 positive patients.

Contrarily, the clinical psychologists did not have direct contact with the Covid-19 patients, one of the respondents interviewed had this to say:

> Well, what we were doing, we are working with them virtually. Because most of our work, we didn't have much contact with the positive cases around reaching them via telemedicine, tele-counseling, phone, phone calls, virtual discussions via zoom. Those are the things I was using to interact with most of the clients, patients that we'll be dealing with through the pandemic may not actually physically contact with the Covid-19 patients. *Female/Clinical Psychologist/IDI*

The above from assertion from a clinical psychologist shows that not all FHWs had to be physically present to treat the patients. Clinical psychologists who provided emotional and psychological support and care like counselling, encouraging and advising the Covid-19 patients had to do that remotely and that went a long way to curtail the spread of the Covid-19. Tele-counselling is a highly innovative way of counselling patients especially during periods of pandemic like the Covid-19. Tele-

counselling, telemedicine and remote working should be imbibed in event of another pandemic.

Another respondent had this say:

Webinar will set up a zoom, and we have all of them there to ventilate, toexpress their feelings. And I plan to handles so many of such cases, we have either we don't talk about their fear, because of that condition. Even some of their colleagues got infected, and some of them died. So anybody will be scared of contacting the virus. So the fear affected them emotionally.They lost friends, but some of them because of the nature of their job. They stood firm, with good PPE is and able to walk through. *Clinical Psychologist/IDI*

The above assertion implies that technology has a huge role to play in reducing the spread of infectious diseases like the Covid-19. Tele-counselling, tele-disagnosis and tele-prescriptions will all aid the curtailing of the spread of infectious diseases. Clinical Psychologists don't need to be psychically present, they can used the above method to further decongest the already congested isolation centres and medical facilities during other pandemics.

High rate of Covid-19 infection among FHWs.

Healthcare workers, both globally and in Nigeria, have an increased risk for SARS-CoV-2 infection compared with the general population due to higher risk contacts, including occupational exposures. In addition, primary healthcare workers represent an important group for estimating prior infection to SARS-CoV-2 because they work at the first point-of-contact for most patients yet have not been included in prior COVID-19 seroepidemiology research in Nigeria.

One of the participants interviewed this to say:

> Yes, I mentioned that they I talked about the high rate of contacting the virus among health workers, it is higher among health workers than any other people. This is because they work directly with the patients and health workers are human beings too, we get scared of losing our lives, and all these snowballs into emotional issues, which would eventually affect them. In some kids, some of them are to abandon their duties, performance, which were not emotionally stable enough to deal with that they had to abandonthe cause and whatever. But definitely, it was a tough one for frontline workers who are to engage in philosophy positive cases. *Male Medical Personnel*

The above assertion by the participant shows that the health workers are more vulnerable of contacting the Covid-19 because they are always in contact with their patients and that makes them more vulnerable than any other category of people. Even the health workers too are scared of contacting, they are scared of exposing their children, their loved ones and their families to Covid-19. Hence, more equipment should be given to the frontline health workers to ensure that they are protected.

A focus group member in University of Jos had this to say:

> As for me of course, every day of the week there is fear that I might have, like last week I was negative, but during the process of having contact with infected people, I will not know whether I am still negative or I have contacted the infection. Within the day, what we actually went through was, once you are confirmed to be positive you will discover that people

> are running away from you. The moment one is infected, the fear of people dying becomes very high because of what we heard on news about people dying over there. *University of Jos/FGD.*

This shows that as FHWs go to work every day they are conscious of contacting the Covid-19 and that brings fear and anxiety in them. They are afraid that they might contact the virus today or this week. They become apprehensive because ones they FHWs contacts Covid-19 even their co-workers, friends and family members runs away from them because no one wants to die and no one wants to contact the Covid-19. This further shows that the contacting the Covid-19 was one of the risk factors FHWs faced during the Covid-19 pandemic.

Another participant had this to say:

> In addition to what my colleague said, some of the health workers because they were aware of the sign and symptoms and they are experiencing those symptoms but they keep holding it that was the reason we could not do the correct contact tracing, some will not avail themselves for proper medication, some are hiding to take the medication and when they finally avail themselves it the result will come out positive. When they brought results of our colleagues and it was positive, that was when everybody stating asking for home care, but is your family secured, it was very difficult, I think it was because of the fear of the stigmatization we are talking about. *FGD/University of Jos*

The above assertion by one of the focus group discussions shows that some FHWs contributed in one way or the other in the spread of Covid-19 among themselves, this is because, when some FHWs have the signs and symptoms of Covid-19, they will not isolate themselves due to the fear of stigmatization they will not alert their co-workers that they have signs and symptoms of Covid-19. The fear of stigmatization from co-workers, friends and family members made some FHWs not to open up when they had Covid-19 and that contributed in making contact tracing very difficult and further aided the spread of Covid-19 among the FHWs.

Another participant had this say:

> COVID is real, in fact, all of us were infected in one or the other we were down, we almost lost somebody but thank God he made it our boss almost give up the ghost I don't even want to remember what happened to him because he is almost going, all of us went down with it and we didn't find it easy whether you like or not COVID is real whatever people are saying outside they are saying from a distance they don't experience with the patience that actually went down with it some people actually have some level of resistance or their immune system was able to withstood the infection but for others that went down with it they didn't find it easy so COVID is real. *Male/Doctor/FGD/Plateau State Specialist Hospital*

The above assertion of the male medical doctor shows FHWs contacting Covid-19 was a common and frequent phenomenon. Even of the FHWs lost their lives as a result of the Covid-19 pandemic.

Lack of Personal Protective Equipment (PPE)

The use of Personal Protective Equipment (PPE) at the period of Covid-19 is essential for everyone– right from the frontline health workers, to personnel that involved in decontamination and disinfection as we as the general populace. However, it is more paramount for the frontline health workers because of the crucial role they play. Moreover, the protection of frontline health workers is paramount and PPE including medical masks, respirators, gloves, coverall/gowns, head cover, foot wears, disposable aprons, full face shield, fluid resistant surgical mask and eye protection, must be prioritized for health care workers and others caring for Covid-19 patients. Unfortunately, there was lack of PPE for some frontline health workers in some centres and that contributed as a factor influencing the

mental health dimension of HRQoL of COVID-19 FHWs in Nigeria. One of the interviewees had this to say:

> The roots of virus contraction of frontline health is lack of personal protective equipment, improper disposal of most of these materials, contact with patients, the risk of not having no detergents or solutions to clean up the surfaces and all that. So, like I said those vary depending on the beginning or at some point they had some. *Female/Nurse*

The above assertion by the female participant shows that lack of protective equipment is another risk factor FHWs faced during the Covid-19. The participant observed that some FHWs lacked personal protective equipment, also in some health facilities materials used in treated Covid-19 patients or materials patients came in contact with like bed sheets, pillow cases were not properly disposed, lack detergents or sterilizing solutions to clean up the surfaces all contributed as risk factors FHWs faced during the Covid-19 period.

Another respondent had this to say:

> At the height of the Covid-19 initial period it was hectic for everyone and you were expected to wear PPE which was not provided. *Medical Practitioner Abuja/Male.*

The above assertion by a male medical practitioner further collaborated the above assertion of the previous participants that some FHWs lacked personal protective equipment. This shows that the government did not provide the FHWs with all the needed equipment like the PPE at the initial state of the Covid-19. However, as time went on, most of this equipment became available to FHWs.

> The rate of contracting Covid-19 among health workers was high because Nurses and Doctors were in constant contact with Covid-19 patients that accounted for the spread among frontline workers and also lack proper full equipment, most of us were only have some personal protective and not all. For instance, in Aba Isolation ward in Abia state, the ward was shut down and all frontline health workers were asked to go home due to high rate of infection among the FHWs.

The above assertion by a respondent shows that some of the FHWs did not have the complete personal protective equipment and that resulted to the exposure of the FHWs and which further resulted to the closure of Aba Isolation centre in Abia state as all the FHWs were all infected with Covid-19. Hence government should endeavour to provide the complete set of PPE for all FHWs in subsequent pandemics.

On the contrary, one of the interviews had to this:

> So there's no doubt that there was fear. But one thing that really guided us was the fact that this place is an internationally accredited laboratory. And one of the things that is foremost for you to be accredited is biosafety. Biosafety is measures put in place to prevent infection to you as an individual, to others who are working, who are ignorant of what you are doing, and then to the environment. So those measures are in place and we are conscious of it. So that was part of what helped us talk about. Of course, it's different from an infection that maybe we have to contact sexually and can say, Oh, I won't have the genome, you understand? Or even if is the one they say is a blood borne, I'm not going to take blood. Do I have control? *Male/Virologist/Lagos State.*

On the contrary to the above assertion of previous respondents, the participant from Lagos state virology unit stated that their centre was fully equipped with all the necessary equipment and personal protective equipment. This shows that some states had the capacity to fully equip their centre than other states. Moreover, isolation centres that have been in existence before the emergency of the Covid-19 will be fully equipped compared to centres that was just opened during the Covid-19 pandemic.

This assertion by one of the participants further buttresses the above point:

> Generally, our well beings was seemingly affected, health workers were stressed, infected and depressed and life threatened. They are restrained to where you go, who you meet, workers are daily facing the battle of helping others to live while we lose our lives in the process. So that feeling of the complete sense of good quality of life was poor. our needs were neglected, so depression was inevitable during Covid-19 in Aba. *Male/Medical Doctor/Aba/Abia State*

The above assertion of a male medical doctor from Aba in Abia state shows that aside lack of PPE, the personal, physical, financial and emotional needs of the frontline health workers were mostly neglected by the government. All attention were paid to the Covid-19 patients and the needs of FHWs were relegated to the background. Hence, there is need for proper care and attention of health care workers during the next pandemic.

DISCUSSION OF FINDINGS

The findings from this study reveal a complex interplay of risk factors that expose frontline health workers (FHWs) in Nigeria to significant health and psychological challenges during the COVID-19 pandemic. Central to these findings are three interconnected themes: contracting COVID-19 from patients, the high rate of infection among FHWs, and the persistent lack of personal protective equipment (PPE). One of the most pervasive issues highlighted was the regular and often unavoidable exposure of FHWs to COVID-19 patients. The findings reveal that frontline health workers (FHWs) were at high risk of contracting COVID-19 due to their direct and frequent contact with infected patients, especially in overcrowded hospital settings where teamwork was necessary. Frontline health workers (FHWs) frequently reported an inability to avoid exposure to the virus due to the inherent demands of their roles. They often worked in crowded treatment areas and felt ethically bound by compassion and professional duty to remain with critically ill patients.

Stephen et al. (2022) and Nguyen et al. (2025), which indicated that congested healthcare environments and insufficient isolation protocols significantly elevated infection risks for health workers in resource-constrained settings. Similarly, Momeni and Khatooni (2023) and Pulignano et al. (2023) noted that the professional imperative to provide care during a pandemic frequently superseded personal safety concerns, thereby intensifying emotional strain. This consistent exposure led to considerable emotional distress among FHWs, manifesting as fear of infecting family members, anxiety about their own health, and, in some instances, experiencing stigmatisation from colleagues upon symptom onset. This further supports the conclusions of Alharbi et al. (2025) and Goniewicz et al. (2025) that frontline health workers globally endured heightened psychological distress and social exclusion throughout the COVID-19 pandemic. Disturbingly, some FHWs concealed symptoms or avoided testing due to fear of isolation and stigma, inadvertently contributing to the virus's spread. Negarandeh et al. (2024) confirmed that stigma, denial, and the pervasive fear of discrimination prompted many healthcare professionals to delay testing or treatment, ultimately undermining broader containment efforts.

A second significant finding emerging from the study was the alarming rate of COVID-19 infection among frontline health workers (FHWs) themselves. Our findings indicated that healthcare personnel on the front lines in Nigeria experienced a high incidence of contracting the virus, primarily due to their continuous exposure to infected patients, a risk particularly pronounced for those serving in primary healthcare facilities. FHWs were fearful not just of contracting the virus but also of transmitting it to their families, which created immense emotional stress and, in some cases, led to absenteeism or withdrawal from duty. These observations are corroborated by research from Ilesanmi et al. (2021) and Orji et al. (2023), who reported a heightened infection risk among Nigerian healthcare personnel, primarily due to insufficient personal protective equipment (PPE) and weak infection control systems. A subset of personnel acknowledged concealing their symptoms due to fear of stigmatisation, which complicated contact tracing efforts and inadvertently facilitated viral transmission among colleagues.

Kwaghe et al. (2021) and Mashinini et al. (2024), revealed how stigma and apprehension of social ostracisation deterred many African health workers from disclosing symptoms or seeking testing. Furthermore, findings indicated that nearly all healthcare personnel in certain contexts contracted the virus at some point, with some experiencing severe illness and near-fatal outcomes. This stark reality cultivated profound anxiety, pervasive uncertainty, and severe emotional distress, particularly as even colleagues-maintained distance from those who tested positive. The psychological impact of these cumulative experiences was substantial, aligning with global research such as that by Novilla et al. (2023) and Zamanzadeh et al. (2025), which consistently demonstrated the particular susceptibility of frontline health workers to mental health challenges, including anxiety, depressive symptoms, and emotional exhaustion, throughout the pandemic.

Compounding these issues was the widespread shortage and poor quality of PPE. The findings show that the lack of Personal Protective Equipment (PPE) played a significant role in endangering the health and mental well-being of frontline health workers (FHWs) during the COVID-19 pandemic in Nigeria. Respondents noted the unavailability of essential items such as face masks, gloves, coveralls, disinfectants, and proper waste disposal methods, especially during the early phase of the outbreak. These shortages increased their risk of infection and contributed to widespread psychological distress, fear, and emotional exhaustion. Identical issues were raised within Agbajelola and Ayanyemi (2025) and Fronteira et al. (2024), where noted impacts highlighted that limited PPE supply greatly affected the psychological well-being and physical safety of healthcare workers globally. Some health facilities in Nigeria even had to shut down due to the high rate of infections among staff, which was attributed to inadequate protection. While some centres were adequately stocked and guided by biosafety protocols, others suffered from poor preparedness, revealing a stark contrast in the level of institutional readiness.

In Nigeria, these shortages often compelled health workers to reuse PPE or use makeshift shielding such as plastic bags and raincoats, which not only heightened infection risk but also eroded trust in the healthcare system. The reasoning given was cited in the works of Burton et al. (2024) and Phillips et al. (2024), where they actually highlighted how limiting resources leads to hazardous practices that endangered both staff and patients. The FHW's emotional burden was exacerbated by perceived government inattention because their needs were secondary to patient care. This deepened psychological trauma and distress. Bello et al. (2024), Adebanjo (2024), and Kiwanuka et al. (2024) pointed out that the overwhelming lack of PPE in many African health systems, Nigeria included, created stress and reluctance to work, revealing the need for stronger mental health and preparedness resources in future pandemics.

Implications and Recommendations of the Study

The findings of this study carry important implications for public health policy, health system preparedness, and workforce management in Nigeria and comparable low- and middle-income countries. The findings highlight critical implications for public health policy and emergency preparedness in Nigeria. The inadequate provision of PPE and poor welfare support for frontline health workers (FHWs) during the COVID-19 pandemic not only compromised their physical safety but also severely impacted their mental health and overall quality of life. This neglect threatens the sustainability of the health workforce during future pandemics, as demoralized and unprotected workers are more likely to experience burnout, reduced productivity, and even withdrawal from service. The disparities in equipment availability across centres also point to systemic inequalities in healthcare infrastructure and resource allocation. Therefore, government and health institutions must prioritize the safety and psychological welfare of FHWs through proactive investments in essential protective equipment, robust infection control policies, and comprehensive psychosocial support systems. These measures are essential to ensuring that health workers are adequately protected, motivated, and mentally prepared to respond effectively to future public health emergencies.

Based on these findings, it is recommended that urgent and sustained efforts be directed toward ensuring an adequate, consistent supply of high-quality PPE to minimise infection risk among FHWs. Strengthening health systems must include robust emergency preparedness plans and efficient supply chain management to prevent future equipment shortages. Mental health support should be institutionalized through workplace programs offering counseling, stress reduction initiatives, and stigma reduction activities tailored to healthcare workers' needs, especially in resource-limited settings like Nigeria. Additionally, clear ethical guidelines and decision-making frameworks should be developed to assist frontline workers as they navigate the challenging balance between patient care and personal safety. Continuous training on infection prevention and control, coupled with efforts to cultivate a strong organisational safety culture, will empower health workers to protect themselves and their families effectively. Lastly, formal recognition through awards and public honors should be integrated into health system policies as a means of valuing and sustaining the commitment of frontline health workers, thereby enhancing the resilience of the healthcare system in the face of ongoing and future pandemics.

Limitations and suggestions for future studies

This study was conducted within a specific cultural and institutional setting, which means its findings might not be directly applicable to other healthcare environments or regions with different levels of pandemic preparedness. The reliance on qualitative data, gathered through self-reported narratives, introduces potential limitations such as recall bias or social desirability bias, as participants may have unintentionally altered or underreported their experiences to align with perceived expectations. Furthermore, because the study drew upon retrospective accounts from a period of intense emotional and psychological strain, the accuracy of participants' reflections could be affected. The cross-sectional nature of this research also restricts our understanding of how the challenges faced by frontline health workers (FHWs) evolved over time, or how they navigated long-term exposure to pandemic conditions. While themes were systematically identified during data analysis, the study does not explicitly detail measures taken to ensure inter-rater reliability or to minimise researcher bias, which could influence interpretation.

Moving forward, future research would greatly benefit from adopting longitudinal designs to track the evolving experiences of FHWs over time, and from incorporating mixed-method approaches to capture both quantitative and qualitative insights. Expanding the scope to include diverse healthcare worker cadres and conducting regional comparisons would also significantly deepen the applicability of findings. Additionally, further studies could explore

institutional responses and the effectiveness of leadership in mitigating risks, as well as investigate the distinct gendered experiences of frontline workers, which may reveal nuanced patterns of vulnerability and resilience.

Conclusion

This study sheds light on the critical challenges Nigerian frontline health workers (FHWs) endured during the COVID-19 pandemic. They faced a vulnerable work environment marked by inadequate PPE, frequent exposure to infected patients, the risk of transmitting the virus to family members, and significant psychological distress. These findings emphasise the urgent need for systemic improvements in occupational safety, the integration of mental health support, and enhanced emergency preparedness within Nigeria's healthcare system. Leveraging Protection Motivation Theory, the research illustrates how FHWs' perceived risk and the availability of protective resources shaped their coping mechanisms and motivation. Despite these severe obstacles, FHWs demonstrated remarkable resilience and unwavering dedication. To truly support this vital workforce, policies must ensure a consistent supply of PPE, embed comprehensive psychosocial support into healthcare systems, and foster a strong culture of safety and ethical practice across Nigeria's healthcare infrastructure.

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