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Health Workers Perception on Precautionary Knowledge and Practices in Secondary Hospitals and Isolation Centres for COVID-19 Preventive Measures in Lagos State, Nigeria

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Abstract

This paper assesses Health Workers' perception of precautionary measures, knowledge and practices in selected Secondary hospitals and Isolation centres for COVID-19 preventive measures in Lagos State, Nigeria. The study adopted a mixed-method research design. A sample of 302 respondents was obtained from Isolation Centres and Selected Secondary Health Facilities in Lagos State. The researcher used purposive and simple random sampling techniques to obtain data from the health workers. Through the administration of questionnaires and Key Informant Interviews, data for the study was obtained. The study found that about 201 (69.4%) of 290 respondents agreed that the information provided by the National Centre for Disease Control was adequate for the prevention of the COVID-19 Virus. guidelines: also revealed that all the Isolation centres studied had well-trained medical personnel and IPC guidelines on standard precautions, hand hygiene, and waste management guidelines; similarly, all facilities studied had guidelines for transmission–based precautions contained therein. The study therefore recommended amongst others that There should be adequate and efficient collaborations among all stakeholders in the fight against COVID-19 disease.

Keywords: *COVID-19, Centers, Health workers Precautionary Measures, Infection Prevention and Control Preparedness, Isolation.*

Introduction

It is generally known that health-care workers (HCWs) often come in contact with blood-borne pathogens and other microorganisms [1]. These exposures commonly occur during major or minor surgical procedures, during routine clinical and nursing services like simple physical examination, while handling laboratory specimens, and during disposal of hospital wastes as well as during accident and life-saving emergency procedures [2]. On exposure, HCWs can equally transmit Healthcare-Associated Infections (HAI) to their patients or may even become the source of infection for their families and communities. Occupational exposure to HAI is of great concern in developing countries where there are higher risks of exposure to bloodborne pathogens, frequent contact with patients' body fluids and little or no protection against airborne infections (Bamigboye and Abidemi [3]).

Universal precautions are a set of guidelines that aim to protect healthcare workers (HCWs) from blood-borne infections [4]. In 1987, the Centers for Disease Control and Prevention (CDC) proposed the concept of "universal precautions" originally designed to protect healthcare workers from exposure to bloodborne pathogens. In 1996, the CDC recommended that universal precautions be renamed standard precautions, which combine the major features of the universal precautions and Body Substance Isolation (BSI), to have a better effect on infection control. The precautions apply to all body fluids including blood, secretions, and excretions (except sweat)

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regardless of whether or not they contain visible blood, skin that is not intact, mucous membranes, or any unfixed tissue or organ (other than intact skin) from human (living or dead), human immunodeficiency virus (HIV) or hepatitis B virus (HBV) containing culture medium or other solutions [5]. Generally, under the standard precautions, blood and body fluid of all patients are considered to be potentially infectious for HIV, HBV and other blood-borne pathogens. This also includes pathogens that can be transmitted through routes of infections in the human body. Standard precautions are regarded as an effective means of protecting HCWs, patients, and the public, thus reducing hospital acquired infections which when underestimated has the potential to cause disastrous outcomes. Standard and transmission-based precautions are designed to prevent health care workers from being exposed to potentially infected blood and body fluid by applying the fundamental principles of infection control, through hand washing, utilization of appropriate protective barriers such as gloves, mask, gown, and eye wear [6]. In addition, the standard precautions stipulate that HCWs take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices during procedures and disposal [7].

When the Covid-19 was at his peak, majority of secondary health facilities in Lagos state have recorded a large number of frontline and non-frontline health workers who were infected with COVID-19 and were admitted to various treatment centers in the state. A detailed analysis of infected health workers with confirmed infection showed that all cadres of health workers were affected. For example, facilities that recorded infection among medical doctors, nurses and medical laboratory scientist also had medical record officers and pharmacist who were also infected. COVID-19 disrupts the globe: a typical case of unintended consequences of globalization. The flow of people aids the flow of infectious diseases (such as the Ebola virus disease and coronavirus). From a few imported cases, most nations are now battling with thousands of cases and deaths. In Nigeria, the country's existing health facilities and equipment (including ventilators and PPE) are grossly inadequate to handle medical emergencies [8]. Although the number of isolation facilities and capacity for intensive care units (ICU) in the country is growing, they are inadequate as many states are still struggling to set up isolation and treatment facilities.

Beyond the shortage of Personal Protective Equipment (PPE), health workers also face high risks and challenges. They are always on the front line—taking care of the numerous COVID-19 patients increases their exposure to infection. As in the case of the Ebola virus disease, health workers often have a substantial share of the casualties[8]. The fight against COVID-19 cannot be sustained and effective without properly motivating health workers. As the front line soldiers, all health workers should be covered by life insurance. Given the altruistic behavior of health workers, their protection should be paramount in the fight against COVID-19. It is also vital to provide PPE for health workers in the regular health centers, not only those staffing the isolation centers. Since COVID-19 presents with a symptom complex, i.e., like malaria and other diseases, individuals with unsuspected COVID-19 might report at health facilities where health workers and other patients might be exposed to COVID-19. Also, in the absence of PPE for the regular health workers, suspected COVID-19 cases might be rejected, which might lead to an upsurge in mortality from non-COVID-19 diseases.

There are concerns that the fragile health system might be unable to care for a high incidence of COVID-19 infection, which could lead to dreadful consequences in terms of morbidity and mortality. Many western countries (including Italy, the USA, and Spain) seem to have been overwhelmed by thousands

of daily deaths. Again, the pressing concern is that the last burden of COVID-19 might be in Africa, and Nigeria could carry the most onerous burden if more effective precautions against the virus are not continuously enforced. The rush to fully reopen the economy might be a significant factor in a possible uncontrollable rise in cases after the first 100 days of COVID-19 in Nigeria. Evidence from the relaxed lockdown supports this fear if the economy is prematurely reopened without substantial precautions. Public health gains should be prioritized along with, if not prior to, economic gains.

Furthermore, there is a gross shortage of health facilities and health workers in rural areas where more than 60% of Nigerians reside [9]. A rural COVID-19 outbreak might spell doom for any community in Nigeria as well as Africa. At present, the urban outbreak is overwhelming some countries, including South Africa. The African continent must be very proactive in preventive and public health campaigns.

Statement of Problem

While the lockdown has been helpful, it limits economic activities. In a typical resource-constrained society, it creates the "hunger-virus." A four-week lockdown was enforced to restrict the movement of people to curb the spread of the virus. The informal sector dominates the Nigerian economy. A lockdown prevents most people in this sector from economic activities, which will invariably increase poverty and unemployment while threatening human survival in general. Unfortunately, there was a gross shortage of palliatives in the form of foodstuffs and cash, which could have cushioned the effects of the lockdown. There is no proper coordination in the distribution of the meager palliative. This raises the question of equity in the allocation of resources. The millions of people not empowered before the pandemic constitute a considerable burden in the government's efforts to distribute palliatives. Without adequate palliatives, civil resistance to the lockdown and other precautions is imminent, which is inimical to the public health strategy of curtailing the virus [10].

Finally, there was poor coordination among Nigeria's component units: the 36 states and the Federal Capital Territory (FCT). Initially, there was a controversy as to whether a state governor could independently lock down a state without recourse to the federal government (FG). Despite the controversy, Lagos State announced a partial lockdown before the federal government did the same with an initial 14-day lockdown of two states and the FCT. Some other states were hesitant to effect a lockdown while some were proactive, irrespective of state-FG power relations. The control efforts could have been better organized if the NCDC had established a link with state COVID-19 coordinators who would then advise the state governors. A multi-sectoral coordination and pro-activeness should enable Nigeria to successfully fight the 2014 Ebola virus disease; the same approach would have helped in defeating COVID-19. With this in there is a need for the nation to gauge the experienced garnered from the Covid-19 saga. Hence there is the need to ascertain the perception of health workers on precautionary measures, knowledge and practices in selected Secondary hospitals and Isolation centres for COVID-19 preventive measures in Lagos State**.**

The objective of the study is therefore to assess the Impact of Health Workers perception on precautionary measures, knowledge and practices in selected Secondary hospitals and Isolation centres for COVID-19 preventive measures in Lagos State. The research was therefore guided by this research question: what is the perception of Health Workers on precautionary measures, knowledge and practices in selected Secondary hospitals and Isolation centres for COVID-19?

Methodology

The study was conducted in ten (10) Isolation Centres and ten (10) secondary health facilities in Lagos State, Nigeria. A qualitative approach was used to collect data for the study. Key Informant Interviews were conducted while questionnaires were administered. A sample of 302 respondents was used in the study. Data was collected through purposive and simple random sampling techniques. The administration of survey questionnaires to healthcare workers at service delivery points was done through the help of research assistants who were on duty in the selected facilities including the ten (10) selected COVID-19 isolation centres and secondary facilities. The data obtained from respondents from the fieldwork were entered into Microsoft Excel, cleaned and coded. The researcher used a descriptive method of data analysis to analyze the data collected.

Literature Review

Early Response to COVID-19 Case Management in Nigeria

COVID-19's mode of transmission is still under scientific investigation; hence, people are advised to observe safety guidelines (such as safe handwashing, social distancing, or staying at home). These behavioural change imperatives transform the nature of social life and realities in Nigeria. The new social normal adversely impacts livelihood and survival chances, amidst grossly inadequate palliatives. Experiences and lessons from the worst-hit countries (e.g., the USA, the UK, Italy, France, and Spain) prove that no country can adequately prepare to contain the COVID-19 pandemic. Globally, only a few countries have achieved generalized testing. In most countries, significant challenges being faced due to the COVID-19 pandemic include inadequate healthcare personnel to manage the patients, insufficient medical resources (especially personal protective equipment [PPE] and ventilators), and inadequate facilities and treatment centers, among others.

Many health experts projected that Africa would face a hard time and struggle to keep the coronavirus outbreak under control once it is confirmed on the continent. The concerns were based on pervasive poverty, weak healthcare systems, and the diseases ravaging most parts of Africa. As of June 7 (2020), no country in Africa was coronavirus-free; the confirmed cases (in Africa) stood at 192,721, with about 5,200 deaths and 85,107 total recoveries [11]. Generalized testing is a significant measure for detecting cases; unfortunately, universal testing may not be possible in all parts of Africa (including Nigeria) due to inadequate resources. Nevertheless, every imperfect but best possible effort to stop the infection constitutes marginal gains and a step in the right direction until a cure is discovered.

The Spread of COVID-19 in Nigeria During the Lockdown

The number of new infections has been undulating since the outbreak started in Nigeria. The highest number of new cases in the first 100 days was recorded on May 30, when 553 of the total samples tested came back positive. Between March 28 and June 7, the country recorded an upsurge of the total number of confirmed cases. There is a positive relationship between the number of cases and the creation of more testing centres. also shows an increase in the case fatality rate (CFR) and the number of discharged patients within this period. A walkthrough testing centre was opened by the Oyo and Ogun state Governments [12]. A possible reason for the high number is the stage of infection; the country had reached the phase of community transmission [13]. Signs of community transmission were first publicized at a press briefing on April 1, and this later became more evident with 203 positive cases whose sources of infection remain indeterminate, according to the NCDC [14].

It is on record that 812 healthcare personnel (approximately 6.5% of the positive cases)

were known to have contracted COVID-19 in Nigeria [15]. Some of these cases were from patients with a subclinical coronavirus infection who presented in hospitals with other conditions while hiding vital information from health workers [16]. A shortage of personal protective equipment at some isolation centres is another reason why some health workers were infected. An additional contributory factor is the unethical practices of some medical practitioners who run private hospitals in locations such as Lagos. Private hospitals were said to be secretly treating patients, who tested positive for COVID-19, without government approval [17].

Public Health Awareness for the Spread of COVID-19 in Nigeria

Public health education and risk communication campaigns on coronavirus commenced in earnest with the reported index case of COVID-19. Both conventional and social media, including WhatsApp, Twitter, and Facebook, have assisted in disseminating updates on the virus [18]. The NCDC provides regular updates on the outbreak with support from major telecommunication operators in the country. Additionally, there are sensitization activities across some streets in the country by the National Orientation Agency (NOA), non-governmental organizations (NGOs), Faith-Based Organizations (FBOs), and other development partners. The NCDC regularly publishes guidelines on the prevention of coronavirus (social distancing, safe handwashing, maintenance of personal and respiratory hygiene, etc.) as well as a directory of helplines for each state [19]. Messages on the COVID-19 infection were equally translated into local languages to reach the general Nigerian population.

The NCDC uses a communication campaign with the theme, Take responsibility, on social media for a Nigerian audience [20]. This is to emphasize the role of the individual both in the prevention of COVID-19 and the social upkeep of their health while the pandemic lasts. However, the extent to which public health education has influenced positive behavioural changes among Nigerians remains vague. Many people and faith-based organizations have continued to defy the directives on social distancing and public gatherings by organizing social events, while some worship centres also conducted congregational services. The government consequently adopted enforcement strategies through the deployment of police, military, and paramilitary organizations. However, this development also generated many problems due to the brutality of some security officers [21].

Generally, the response to the coronavirus outbreak in Nigeria could be described as medico-centric and reactionary. The federal and state governments only set up isolation centres after positive cases were confirmed in the country. For instance, there was no molecular laboratory in Ogun State, where the index case was identified; the patient was transferred to Lagos State for diagnosis and treatment. The same applies to other states (such as Akwa Ibom, Oyo, Sokoto, and Abia), where the governments acquired medical equipment to fight the outbreak only after positive cases had been reported. The inadequate proactive preparedness accounted for the initial panic wave created by COVID-19 in Nigeria. The pandemic also exposed the healthcare infrastructure's generally deplorable state—a significant reason for the medical tourism embarked on by the Nigerian elite. The greatest lesson of COVID-19 for Nigeria is the impossibility of taking foreign medical trips mainly to Germany, the UK, and the US for the treatment of COVID-19. It is a norm for most African politicians, who underfund and under-develop their health institutions, to travel abroad for healthcare. The federal and state governments are squeezing out funds to upgrade or set up some facilities to boost the COVID-19 response capacity.

The Federal Government released a five billion Naira (US$ 12.5 million) special intervention fund and an aircraft to the NCDC for emergency responses. An additional ten billion Naira (US$ 25 million) was also released to Lagos State, the epicentre of the outbreak [22]. The President also approved that pilgrimage transit camps be converted to isolation centers [23]. The Federal Government also advised all state governors to establish a minimum of 300-bed treatment facilities, in anticipation of a further upsurge. These announcements were made after the number of positive cases had escalated. Many of the states underrated the pandemic potential of COVID-19, with some governors believing that God would not allow COVID-19 to be reported in their states. Only a few states (such as Anambra and Cross River) have been proactive by instituting some measures, including the creation of isolation centers, compulsory use of facemasks, and a ban on public gatherings before any confirmed case had been reported.

The PTF has been holding daily press briefings to enlighten people and address some pressing concerns. This includes deliberate efforts to debunk some myths or rumours about COVID-19. More efforts are still required to reach rural dwellers and non-literate communities [24]. Rumor surveillance is very vital in curbing misinformation and myths [25]. It is also necessary to “treat” some “covidiots," those who hold and spread myths or misconceptions about COVID-19. The “covidiots" also include those who refuse to observe precautionary measures because of such misconceptions. The medical response relies on the availability of testing kits, the creation of isolation centres, and PPE provision for health workers. The country also needs to motivate health workers to hold the front lines against COVID-19. There have been some controversies regarding the meagre hazard allowance and life insurance provisions for the "front liners."

Due to increasing evidence of community transmission, the PTF recommended case searching, involving house-to-house search, which has increased the number of cases detected, especially in Lagos. More case detection means more contact tracing. The process further involves social filtering, recognizing those with or without risks, and promoting safety measures. The ultimate result is to quash the host-agent link to reduce the incidence of COVID-19. The palliatives and economic stimuli are meant to minimize the adverse effects of a lockdown or restricted movement. As previously observed, the informal sector dominates the Nigerian economy; most of the participants are daily wage earners. The government has been struggling to cushion the adverse economic effects through the distribution of food items that have been grossly inadequate and unevenly distributed. The country has no reliable database of vulnerable citizens; a national registration of citizens has not been effectively implemented. The vulnerable citizens face the “hunger virus” amidst the coronavirus lockdown. Unfortunately, the pandemic has significantly threatened the country's economy due to the collapse in oil prices, lockdown, limited economic activities, and increased spending on health. While the framework has helped in the fight against COVID-19 in Nigeria, some loopholes still undermine it.

Global Responses to COVID-19 Pandemic

One of the empirical studies on COVID-19 reviewed by the researcher opined that to surmount the challenges faced by the pandemic various national governments took far-reaching measures to contain the rapid spread of the virus. They adopted several media campaigns and other measures that modified their health systems response to the pandemic. In Nigeria, the government responded by providing public health education and risk communication campaigns using both conventional and

unconventional methods of disseminating information through the radio, television, print media, and social media handles like Twitter, WhatsApp, and Facebook to appeal to the public. The Presidential Task Force (PTF) on COVID-19 was established on 9th March 2020 to coordinate and oversee the activities of different sectors of the economy as well as inter-governmental efforts toward the containment of the COVID-19 outbreak in Nigeria.

The National Centre for Disease Control (NCDC) created the national coronavirus preparedness group (NCPG) which was multi-sectoral in nature to review COVID – 19 epidemiology, risks associated with the disease as well as strengthen Nigeria's readiness for early testing, detection, and management of COVID-19 outbreak in Nigeria. Following the outbreak of COVID–19 in Nigeria, the NCPG was renamed the National Multi-Sectoral Emergency Operations Centre with additional functions but not limited to research, COVID-19 coordination, surveillance, logistics, and laboratory testing at point of entry (POE). The NCDC, and federal and state governments also activated molecular biology and isolation centers in different parts of the country for the containment of the disease. The NCDC used an effective media communication strategy with the slogan 'Take responsibility' as part of COVID-19 awareness for Nigerians'. Despite the national and global efforts towards mitigating the negative effects of COVID-19, the disease caused extensive damage to the social, economic and educational systems of many nations such as Italy, the United States of America, France, the United Kingdom, India, South Africa, and Nigeria. The extent to which Radiography education in Nigerian universities has been affected by the COVID-19 pandemic is yet to be fully understood. This paper therefore x –rayed the effects of the COVID-19 pandemic on Radiography education in a renowned Nigerian University, the Nnamdi Azikiwe University Nnewi campus.

COVID -19 pandemic is a global challenge that requires concerted efforts of governments at various levels, scientists and policymakers to address the complex multifaceted challenges and fallouts of the disease. The COVID -19 pandemic despite bringing cleaner urban air temporarily also brought socio-economic lockdowns and movement restrictions. The global response to the coronavirus pandemic also resulted in economic recessions, public health issues such as increased hunger and malnutrition, obesity, and chronic health conditions, as well as the crisis in the education sector. Another major challenge to the global response was the inability of scientists and the World Health Organization to quickly develop and supervise the distribution of free vaccines for general immunization during the early days of the pandemic. This would have gone a long way to arrest the spread of the COVID-19 virus and prevent community transmission.

Results and Discussion of Findings

Three hundred and two respondents were administered the questionnaire in the selected Isolation Centres and Secondary facilities in Lagos state. Twelve questionnaires were unaccounted for though it had no negative effects on the results as 85% of the questionnaires were filled and returned. All the Isolation Centres and Secondary health facilities selected for the study completed the health facility assessment form and a total of 290 participants completed the study questionnaire and were included in the data analysis.

Table 1. Distribution of Respondents According to Gender in Isolations Centres and Secondary Facilities

Gender of Respondents	Number (%)
Males	120 (42%)
Females	170 (58%)

Total	290 (100%)

Source: Field Survey 2023

Table 1 shows the demographical representation of the sex of respondents in the selected isolation centres and secondary health facilities in Lagos State. The table shows that females with 58 per cent completed the questionnaire and were more in numbers than the males. This indicated that during the clinical sessions, more females were present. The analysis is supported by the chart representing Fig. 1.

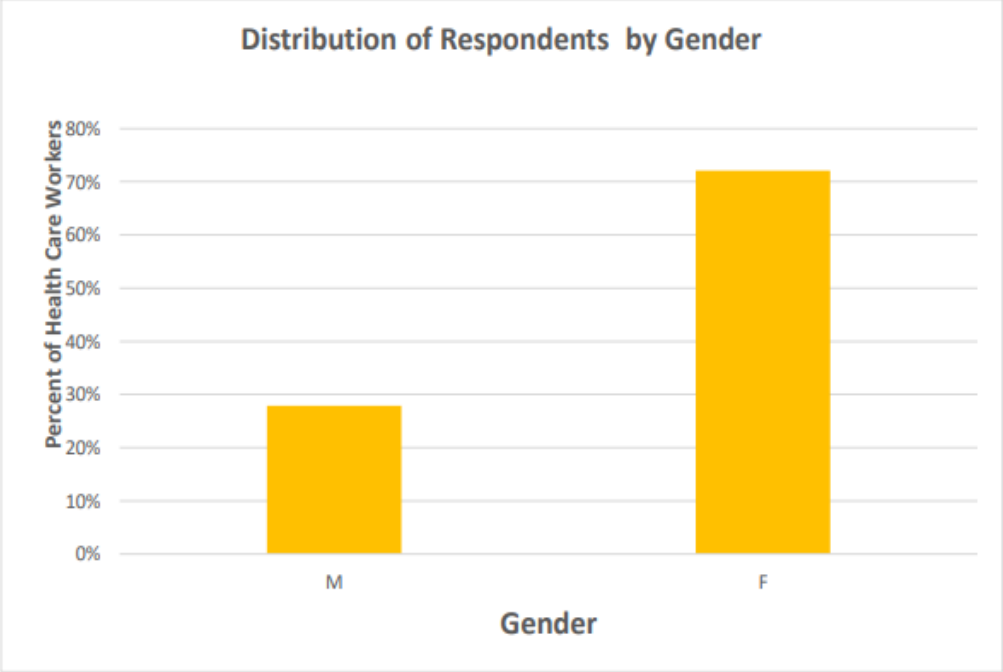

Fig 1. Gender Distribution of Respondents

Table 2. Comparison of Clinical' and Non-clinical' Workers Knowledge Regarding COVID-19 Prevention Strategies

Variables	**N**		**P**
Screening and Triage	**Clinical**	**Non-clinical**	
Excellent	20	9	
Good	63	30	
Average	80	10	<0.001
Poor	35	20	
Very poor	10	10	
Total	208	79	
Early detection and source control			
Excellent	19	8	
Good	64	20	0.00019
Average	73	14	
Poor	30	30	
Very poor	4	5	

Total	190	77	
Standard precautions			
Excellent	45	19	
Good	64	22	0.00012
Average	70	20	
Poor	32	36	
Very poor	7	0	
Total	218	97	
Contact precautions			
Excellent	24	28	
Good	68	22	0.0006
Average	75	26	
Poor	29	18	
Very poor	5	4	
Total	**200**	**90**	
Droplet precautions			
Excellent	43	25	
Good	80	25	0.0001
Average	58	15	
Poor	37	30	
Very poor	0	5	
Total	**200**	**90**	
Airborne precautions			
Excellent	54	13	
Good	98	32	<0.001
Average	47	16	
Poor	17	25	
Very poor	4	5	
Total	**200**	**90**	
Administrative control: education of HCW and available policies			
Excellent	42	22	
Good	90	14	<0.001
Average	62	34	
Poor	13	13	
Very poor	3	4	
Total	**200**	**90**	
Environment and Engineering Control: Ventilation and Cleaning			
Excellent	40	23	
Good	70	16	0.0006

Average	41	18	
Poor	45	30	
Very poor	3	4	
Total	**200**	**90**	

Source: Field Survey, 2023

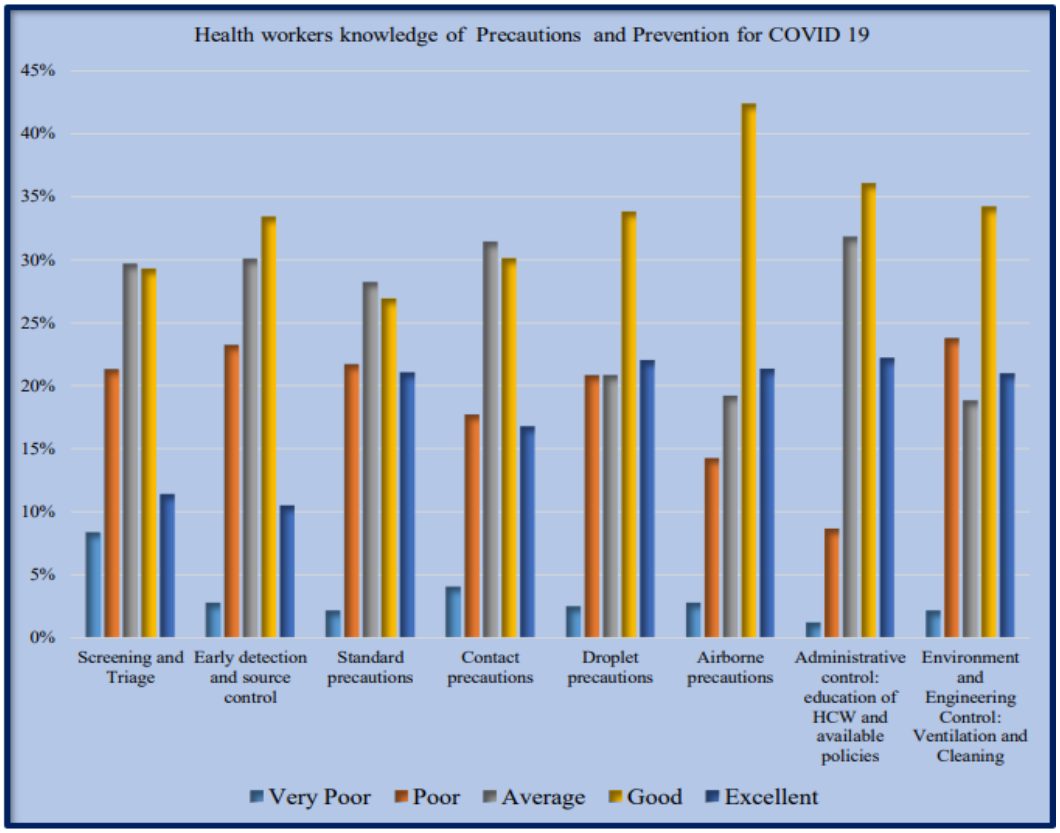

Figure 2. Health Workers Rating of their Knowledge on Precaution and Prevention for COVID-19 in Lagos State

Readiness of Isolation Centres and Secondary Facilities on COVID-19 Management and Control in Lagos State

This section of the questionnaire dealt with the issue of COVID-19 management and control. The spread of the disease came into Nigeria at an alarming rate after the index case. Managing the spread became so inevitable given the spate of infection and spread in Nigeria generally and Lagos state specifically. It is of course pertinent to posit here that management and control of Covid 19 is the responsibility of the National Centre for Disease Control (NCDC). Table 2 presents data on information about the Covid 19 pandemic.

Table 3. Information Provided by the National Centre for Disease Control about COVID-19 are Adequate?

Option	Response	Percentage
Yes	201	69.4%
No	89	30.6%
Total	290	100%

Source: Field Work, 2023

In response to the question, Table 3 shows that 201 (69.4%) of the respondents agreed that the information provided by NCDC are adequate while 89 (30.6%) of the respondents

disagreed. This shows that the majority of the respondents strongly agreed that the information provided by the NCDC on COVID-19 and its control measures is adequate. The study examines respondents' views on interventions for health workers on IPC as part of COVID-19 prevention.

It is pertinent to state here that all the 20 facilities surveyed were government-owned, 10 of them were Secondary health facilities (General and Isolation Centres). All facilities surveyed had IPC. There were IPC committees to support IPC. It was also observed by the researcher that senior facility leadership took part in IPC-related activities. All facilities have an IPC program with Microbiological laboratory support.

All the Isolation centres studied had well-trained medical personnel and IPC guidelines on standard precautions, hand hygiene, and waste management guidelines. All facilities studied had guidelines for transmission–based precautions, outbreak management and preparedness. From the study, the education and training of healthcare workers were assessed and it demonstrated that all the facilities have expert IPC personnel to lead trainings and regularly train new employees.

Monitoring/Auditing of IPC practices and feedback was also evaluated and it indicated that all the facilities though they have monitoring and audit systems for practices and feedback, are of varying degrees. None of the facilities performs monitoring and feedback in a blame-free manner and feedback auditing reports on IPC as required in the facilities except LASUTH and LUTH as observed by the researcher.

While some of the secondary facilities in Male Isolation Centres and A Ward have well-defined planned for monitoring, safety cultural factors, and assessing processes and indicators needed as well as assessing self-hand hygiene practices, the other facilities do not carry out such activities. In IDH ICU study facilities, there is no multi-disciplinary team supporting multi-modal strategy and no apparent link between quality improvement and the patient safety team working with the IPC team for better strategies implementation. As indicated by the study, none of the facilities had strategies for system change and safety climate and culture change. All the facilities have multi-modal strategies as part of their IPC programme with evidence on Education and training, communication and reminders, and monitoring and feedback.

Only 15 facilities out of 20 had water services available every day and of sufficient quantity for use. Also, 4 (facilities had safe drinking water stations accessible for facility staff, patients and caregivers at all times. More so, Alimosho and Apapa General Hospital facilities had quality water, soap and single-use towels in all assessed wards and at all points of care for recommended hand hygiene practice. All 12 facilities had functioning toilet facilities but only 6 had a sufficient number based on standard recommendations. The majority of the facilities had readily available materials for disinfection such as detergents, buckets and mops, but they were not sufficient or properly maintained. In some of the state General Hospitals particularly Badagary General Hospital, Ifako Ijaiye General Hospital and Ibeju Lekki General Hospital the researcher observed that there were no dedicated isolation rooms for COVID-19 patients. Additionally, PPEs were available but not in sufficient quantities in all the facilities. None of the facilities conduct regular staffing needs assessments and no system in place in the facilities to respond to staff needs. On the other hand, in all the facilities, there is a system to assess facility capacity needs but not sufficient to respond when adequate space is exceeded, A distance of > 1 meter was maintained between patient beds and one patient was allocated to one bed.

To buttress the above analysis one of the aids to the Chief Medical Officer (CMD) a respondent in LASUTH stated:

> *Overall, regarding the IPC readiness in our hospital, the "basic" level of readiness needs to be improved. The isolation centres were created and most equipment particularly PPEs provided to show the level of IPC readiness. However, they need to do more. To develop or adapt IPC guidelines, provide varying degrees of education and training activities, and deploy surveillance for IPC interventions*.

Discussion of Findings

Since the first wave of globalization which roughly occurred around the century ending in 1914, increasing globalization, population and intrusion of man into new places have led to exposure of humans to unknown pathogens which results in new diseases called emerging diseases. Emerging and re-emerging diseases have always posed a threat to human health. Recent emerging diseases were Sever Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), Ebola, Chikungunya, Avian flu, Swine flu and Zika. The latest among emerging diseases was discovered in Wuhan City, Hubei province of China in late December 2019 which is known as Corona Virus Diseases 2019 (COVID-19). From when this new disease was discovered, observing certain set of precautions including standard and transmission-based precautions has been the viable strategy to limit its transmission among the human population. The findings therefore revealed that:

1. Health workers' exposure to supportive interventions for improving precautions for COVID-19, 84% and 54% as shown in the paper have heard of standard precautions and transmission-based precautions respectively.
2. Knowledge and practices of standard and transmission-based precautions were found to be 73% and 53% respectively necessary for COVID-19 prevention. Compared with the non-clinical category of workers, the study indicated that clinical service providers had better knowledge of a majority of the studied items. Though of varying degrees, the differences in knowledge regarding screening, standard precautions, components of transmission-based precautions, and ventilation and cleaning were statistically significant (p-value < 0.005).
3. Healthcare workers' perception of hand and respiratory preventive measures for COVID-19, more than 85% of the respondents regard washing of hands before performing aseptic procedures, after glove removal, before touching a patient, before exiting the patient care area, and after contact with blood, body fluid or excreta to be important. Similarly, more than 75% of the participants feel that covering of mouth/nose with tissue when coughing or sneezing, coughing or sneezing into a closed elbow and using surgical masks on the coughing person when tolerated and appropriate for suspected cases will improve the prevention of COVID-19.
4. For healthcare workers' satisfaction level with the availability of disinfectant supplies, equipment, materials and activities for COVID-19, only 20% of the healthcare workers were either satisfied or very satisfied. Regarding health facility readiness for the IPC practices, 50% of the facilities were found to be at the "basic readiness level", another 45% of the facilities were found to be at the "intermediate readiness level, while the remaining

16% facilities were at "advanced readiness level.

5. It is important to posit here that secondary health facilities like the general hospitals in Lagos state had more respondents and pressure of out–patient issues. Though, their level of awareness of the use of PPEs is very high materials, equipment and even disinfectants are not adequate in the facilities. There are also inadequate Doctors and nurses with training in infection control and prevention. On-clinical staff were found and more in number during the period of the survey.

Conclusion

The findings from this study also indicated that the majority of secondary health facilities and COVID-19 isolation centres in Lagos state are not fully ready for the prevention of hospital-associated acquired COVID-19 transmission and infection due to the gaps in health facility IPC readiness level, health worker knowledge and practices, and inadequate supplies of disinfectant agents, materials and equipment. COVID-19 has already spread to almost every country in the world including the Arctic. The impact on human health has been severe, with an increasing number of fatalities with this comes economic hardship due to the preventive strategies adopted by the government. Nigeria, like other developing countries, is still battling the menace of COVID-19 and it will worsen if urgent steps are not taken.

Recommendations

1. There should be training and re-training and this should be closely followed by supportive supervision and mentoring particularly focusing on on-the-job training sessions. A comprehensive quantification exercise should be conducted to determine the actual needs regarding disinfectant supplies, materials, and equipment for individual facilities.
2. There should be adequate and efficient collaborations amongst all stakeholders in the fight against COVID 19 and such collaborative work must be well documented to serve as literature and a guide for future references. This document must be well-detailed and compared to relevant documents in several parts of the world so that international best practices be imbibed here at home.

Conflict of Interest

This paper entitled: Health Workers Perception on Precautionary Knowledge and Practices in Secondary Hospitals and Isolation Centres for COVID-19 Preventive Measures in Lagos State, Nigeria is the writer's contribution to knowledge on the fight against Corona Virus Disease. It was made possible through self-funding. The paper was written by **TOMMY TOLULOPE.** An independent researcher, with research assistance from Dr Adole Raphael Audu, Department of Public Administration, University of Maiduguri, Borno State, Nigeria. Peer reviewed at College of Public Health, Texila American University, Guyana, South America. The views expressed in the paper are those of the author, and the authors cited in this work are acknowledged in the references.

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