



Covid-19 Pandemic Infection And The Personal Protective Equipment Use For Prevention Of Infection Among Nurses In Rivers State

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ABSTRACT

This seminar investigated Covid-19 Pandemic Infection and the Personal Protective Equipment Use for Prevention of Infection Among Nurses in Rivers State. Five objectives, research questions and hypotheses were posed to guide the study. Survey Research design was used for the study. The population of the study was 2,688. A sample size of 30 percent with a total of 806 health workers was studied. Data for the study were collected by means of questionnaire titled “Covid-19 Pandemic Infection and Personal Protective Equipment Used among Nurses Working Questionnaire (CPIPPENQ). The CPIPPENQ adopted a modified four point Likert scale of Strongly Agreed to Strongly Disagree. Test-re-test method was used for the reliability test which yielded reliability co-efficient of 0.97. Copies of questionnaire were distributed, and 667 were retrieved for analysis. Mean and Standard Deviation were used to answer the research questions, while z-test was used to test the hypotheses. The health care workers in this study are well aware of the aetiology of Coronavirus disease, mode of transmission and symptoms. Recommendations made were that there is need for government to adequately supply PPE, since it is paramount in protecting patients and health care workers. The healthcare workers must insist on the provision and use of PPE before attending to any suspected or confirmed case, no matter the emergency.

Keywords: Covid-19 Pandemic Infection and Personal Protective Equipment

INTRODUCTION

COVID-19 virus is transmitted between people through close contact and droplets, not by airborne transmission. The people most at risk of infection are those who are in close contact with a COVID-19 patient or who care for COVID-19 patients. Personal protective equipment has become an important and emotive subject during the current coronavirus (COVID-19) epidemic. COVID-19 is predominantly caused by contact or droplet transmission attributed to relatively large respiratory particles which are subject to gravitational forces and travel only approximately one metre from the patient. Airborne transmission may occur if patient respiratory activity or medical procedures generate respiratory aerosols. COVID-19 is spread by droplets Infection (Wu, Chen, & Chan, 2020). It shows that this virus is extremely infectious and spreads mostly among those who come in contact. Hand washing is one in each of those basic items which we never expect to be asked about, and it's proven in controlling the infectious disease like this.³⁻⁴ Personal protective equipment (PPE) has become a crucial and sensitive subject during this COVID-19 pandemic.

COVID-19 spreads predominantly by large respiratory particles such as a droplet, close contact, or perhaps aerosol transmission, which are subject to gravitational forces and travel approximately 2 meters from the patient (Salemi, Canola & Eck, 2002). Personal protective equipment is an important

component, but only one part, of a system protecting staff and other patients from COVID-19 cross-infection. Appropriate use significantly reduces risk of viral transmission. Personal protective equipment should logically be matched to the potential mode of viral transmission occurring during patient care – contact, droplet, or airborne. The covid-19 pandemic poses a huge challenge for nurses, midwives, doctors and the laboratory staff. Government at all level should be very serious in providing additional protection for both the nurses and patients, nurses and other health professionals, nurses and their families and nurses and their communities. If the government and other stakeholders interested in the wellbeing of its citizenry are serious to achieve success in the fight against the corona virus pandemic, they must remember that providing health care services without adequate protection present a very high risk of covid-19 infection to the nurse and other health care providers.

Personal protective equipment such as gloves, face masks, boots, earplugs, goggles, hard hats, thin protective clothing, respirators, safety shoes are essential components, but only one aspect of a system, protecting staff and other patients from COVID-19 cross infection, Setti, Passarini, De Gennaro, Barbieri, Perrone, Borelli, Palmisani, Di Gilio, Piscitelli, & Miani, (2020). Appropriate use of PPE significantly reduces the danger of viral transmission. Personal protective equipment should be up to the noble standards to stop the transmission from patient care contact, droplet, or airborne. Recommendations from international organizations have specified different protective tools, but the proper technique to use equipment isn't much highlighted. Uncertainty remains around specific details of protective equipment, including hoods, gloves, mask type, and the potential for re use of PPE kit. Moreover, preventing transmission of this deadly COVID -19 virus requires two major things: make availability of high standard PPE and appropriate technique to use this equipment by our frontline healthcare workers. Without proper Hand hygiene and proper use of PPE, it's impossible to scale back the danger of infections, especially in frontline Nurses.

The nurse is the one that goes close to the patient most hence the entire nursing community is in the risk zone and everyone have seen the unprecedented levels of overwork by nurses. These overwork ranges from taking care of patients in the intensive care units, those directly involved in the management of covid-19 pandemic and those involved in home care even management of their own immediate families. Often times they don't have adequate rest, there is no support nor assistance, non to allay their fears and anxiety, with little hazard allowances attached to their monthly salary they tend to break down mentally. The nurse is a human whose body fluid includes blood and water. She needs help and support to allay her fear and anxiety of the possibility of getting the infection and also infecting other members of her family hence this research work to investigate the covid-19 pandemic infection and the personal protective equipment used amongst nurses working in the public and private sectors in Port Harcourt, Rivers State.

Statement of the problem

The COVID-19 pandemic has posed a great challenge for healthcare systems, as the disease has spread explosively, exceeding hospital capacities and placing Nurses at high risk of exposure. The current global stockpile of PPE is insufficient, particularly for medical masks and respirators; the supply of gowns and goggles is soon expected to be insufficient also. Surging global demand – driven not only by the number of COVID-19 cases but also by misinformation, panic buying and stockpiling – will result in further shortages of PPE globally. The capacity to expand PPE production is limited, and the current demand for respirators and masks cannot be met, especially if the widespread, inappropriate use of PPE continues. Nursing care is the greatest investment made in health care and accordingly has the greatest impact on patient outcomes. Patricia Schwerdtle, Clifford J. Connell, Susan Lee, Virginia Plummer, Philip Russo, Ruth Endacott, Lisa Kuhn, 2020 The hazard faced by nurses in this pandemic has nothing to be compared to their hazard allowance. For instance, the hazard allowance of nurses on a monthly bases ranges between N3,750 to N4,000. There is an increased fear and anxiety in the nurses who are currently assisting in curbing the covid-19 pandemic.

Purpose of the Study

The purpose of this study is to investigate the use of personal protective equipment in the prevention of covid-19 pandemic infection among nurses in both the private and public sectors hospitals and health centres in Rivers State. Specifically, the study is aimed at achieving the following objectives;

1. To ascertain the knowledge of covid-19 infection amongst public and private sector nurses.
2. To ascertain the quality and quantity of personal protective equipments supply to nurses in both the public and private sectors
3. To ascertain the effectiveness of personal protective equipment in the prevention of infection amongst nurses in the public and private sectors.
4. To ascertain the knowledge of proper use of personal protective equipment in the prevention of infection among nurses in the public and private sectors.
5. To ascertain the fear and anxiety of nurses to the use of the personal protective equipment in the prevention of infection.

Research Questions

1. What is the knowledge of public and private nurses as regards the covid-19 infection?
2. What is the quality and quantity of personal protective equipment supply to nurses in the public and private health care sectors?
3. What is the effectiveness of personal protective equipment in the prevention of covid-19 infection amongst nurses in the public and private health sectors?
4. What is the knowledge of public and private health care in the proper use of personal protective equipment in the prevention of covid-19 infection?
5. What are the fear and anxiety of public and private health care nurses to the use of the personal protective equipment in the prevention of covid-19.

Hypotheses

1. There is no significant difference between public and private sector nurses in the knowledge of covid-19 infection.
2. There is no significant difference in the quality and quantity of personal protective equipment supply to nurses in the public and private health care sector.
3. There is no significant difference in the effectiveness of the personal protective equipment in the prevention of infection amongst nurses in the public and private health sectors.
4. There is no significant difference in the knowledge of proper use of personal protective equipment amongst nurses in the public and private health sectors.
5. There is no significant difference in the fear and anxiety amongst public and private health care nurses to the use of the personal protective equipment.

METHODOLOGY

The study adopted a descriptive survey research design and was conducted in Port Harcourt, Rivers State. The Population was of 2,688 health workers from the selected public and private health facilities out of which a sample of 806 was drawn, representing 30 percent of the total population. Data for the study was collected through well-structured questionnaire personally developed and administered by the researcher. The study adopted a five-point rating scale ranging from Very High Extent (VHE) to Very Low Extent (VLE). Reliability for the instrument was determined using test-retest which yielded 0.87. Copies of the questionnaire were valid and 667 usable for study. Mean with standard deviation was used to answer the research questions while z-test was used to test the null hypotheses. The null hypothesis was rejected where the z-calculated value was more than the z-table value otherwise it was not rejected.

RESULTS

The results obtained from the respondents is shown below:

The result of the study was presented according to the research questions and null hypotheses that guided the study. The findings were presented according to research questions and hypotheses tested in the tables below.

Research Question 1: *What is the knowledge of public and private nurses as regards the covid-19 infection?*

Table 4.1: Mean and Standard Deviation on the knowledge of public and private nurses as regards the covid-19 infection (N = 667)

S/N	Item Statements	Private Nurse = 268			Public Nurse = 399		
		χ_1	SD	Remarks	χ_2	SD	Remarks
1	COVID-19 is transmitted by direct contact with infected persons	3.01	1.05	Agreed	2.51	1.12	Agreed
2	COVID-19 is transmitted by dealing with domestic animals	2.90	1.10	Agreed	2.71	1.10	Agreed
3	The virus may be more dangerous in patients with chronic diseases	3.04	0.93	Agreed	2.29	1.14	Disagreed
4	Health care workers are more prone to COVID-19	1.68	0.90	Disagreed	3.15	0.99	Agreed
	Total Mean & SD	=	10.63	3.98	10.66	4.35	
	Grand Mean & SD	=	2.65	0.99	2.66	1.08	

Source: Field Survey, (2020)

Table 4.1 which was for research question one showed that three items were agreed. The respondents agreed that COVID-19 is transmitted by direct contact with infected persons. The virus may be more dangerous in patients with chronic diseases. COVID-19 is transmitted by dealing with domestic animals. The confirmation was made with a grand mean of 2.65 and standard deviation of 0.99 for Private Nurse while that of Public Nurse were 2.66 and 1.08 for mean and standard deviation.

Research Question 2: *What is the quality and quantity of personal protective equipment supply to nurses in the public and private health care sectors?*

Table 4.2: Mean and Standard Deviation on the quality and quantity of personal protective equipment supply to nurses in the public and private health care sectors (N = 667)

S/N	Item Statements	Private Nurse = 268			Public Nurse = 399		
		χ_1	SD	Remarks	χ_2	SD	Remarks
1	The quality of PPE is commendable	1.83	1.01	Disagreed	3.20	0.93	Agreed
2	There is no concern for the quality of PPE	3.43	0.76	Agreed	3.21	0.96	Agreed
3	There is shortage of PPE	3.11	1.00	Agreed	3.21	0.90	Agreed
4	PPE is not available in all health facility	3.05	0.91	Agreed	3.12	0.99	Agreed
	Total Mean & SD	=	11.42	3.68	12.74	3.78	
	Grand Mean & SD	=	2.85	0.92	3.18	0.94	

Source: Field Survey, (2020)

Table 4.2 which was for research question two showed that all the items were agreed. The respondents agreed that the quality of PPE's are commendable but the quantity is in short fall. The confirmation was made with a grand mean of 2.85 and 0.92 while standard deviation of 3.18 and 0.94 for both private and public nurse.

Research Question 3: *What is the effectiveness of personal protective equipment in the prevention of covid-19 infection amongst nurses in the public and private health sectors?*

Table 4.3: Mean and Standard Deviation on the effectiveness of personal protective equipment in the prevention of covid-19 infection amongst nurses in the public and private health sectors (N = 667)

S/N	Item Statements	Private Nurse = 268			Public Nurse = 399		
		χ_1	SD	Remarks	χ_2	SD	Remarks
1	Staff should have access to the PPE that protects them for the appropriate setting and context	3.63	0.65	Agreed	3.33	1.02	Agreed
2	Gloves and aprons are subject to single use, with disposal after each patient or resident contact	3.60	0.77	Agreed	3.11	1.09	Agreed
3	Fluid-repellent surgical mask and eye protection can be used for a session of work, rather than a single patient or resident contact	3.62	0.66	Agreed	3.15	1.08	Agreed
4	Hand hygiene should be practised and extended to exposed forearms, after removing any element of PPE	3.05	1.05	Agreed	3.14	1.05	Agreed
Total Mean & SD =		13.9	3.13		12.73	4.24	
Grand Mean & SD =		3.47	0.78		3.18	1.06	

Source: Field Survey, (2020)

Table 4.3 which was for research question three showed that all the items were agreed. The respondents agreed that Staff should have access to the PPE that protects them for the appropriate setting and context. Gloves and aprons are subject to single use, with disposal after each patient or resident contact, if the above are done rightly, all believes that PPE is effective in preventing covid-19. The confirmation was made with a grand mean of 3.47 and 0.78 and standard deviation of 3.18 and 1.06 as responses of the respondents on both private and public nurse.

Research Question 4: *What is the knowledge of public and private health care in the proper use of personal protective equipment in the prevention of covid-19 infection?*

Table 4.4: Mean and Standard Deviation on the knowledge of public and private health care in the proper use of personal protective equipment in the prevention of covid-19 infection? (N = 667)

S/N	Item Statements	Private Nurse = 268			Public Nurse = 399		
		χ_1	SD	Remarks	χ_2	SD	Remarks
1	Use carefully – don't spread contamination	3.08	0.97	Agreed	3.10	1.10	Agreed
2	Remove and discard carefully, either at the doorway or immediately outside patient room, remove respirator outside room	3.38	0.88	Agreed	3.18	1.03	Agreed
3	Done before contact with the patient, generally before entering the room	3.18	0.99	Agreed	3.29	0.95	Agreed
4	Immediately perform hand hygiene	1.91	1.02	Agreed	3.63	0.71	Agreed
Total Mean & SD =		11.55	3.86		13.2	3.79	
Grand Mean & SD =		2.88	0.96		3.03	0.94	

Source: Field Survey, (2020)

Table 4.4 which was for research question four showed that all the items were agreed. The respondents agreed that proper knowledge of the use of PPE will help to protect them that is remove and discard carefully, either at the doorway or immediately outside patient room, remove respirator outside room. The confirmation was made with a grand mean of 2.88 and 0.96 and standard deviation of 3.03 and 0.94 respectively.

Research Question 5: *What are the fear and anxiety of public and private health care nurses to the use of the personal protective equipment in the prevention of covid-19?*

Table 4.5: Mean and Standard Deviation on are the fear and anxiety of public and private health care nurses to the use of the personal protective equipment in the prevention of covid-19 (N = 667)

S/N	Item Statements	Private Nurse = 268			Public Nurse = 399		
		χ_1	SD	Remarks	χ_2	SD	Remarks
1	Fear of being infected with covid-19	1.83	1.01	Disagreed	3.20	0.93	Agreed
2	Fear of infecting family members	3.43	0.76	Agreed	3.21	0.96	Agreed
3	Fear of financial insecurity due to the impact of the pandemic	3.11	1.00	Agreed	3.21	0.90	Agreed
4	Fear of lack of insurance coverage services	3.05	0.91	Agreed	3.12	0.99	Agreed
Total Mean & SD =		11.42	3.68		12.74	3.78	
Grand Mean & SD =		2.85	0.92		3.18	0.94	

Source: Field Survey, (2020)

Table 4.5 which was for research question five showed that all the items were agreed. The respondents agreed that there is Provision of Personal Protective Equipment (PPE) to all staff who have direct contact with all patients. Adequate surveillance policy has been put in place by the Government will protect them and also prevent them from being infected with covid-19 to procure PPE's for all health facilities. The confirmation was made with a grand mean of 2.85 and 0.92 while standard deviation of 3.18 and 0.94 for both Public and Private nurse.

Test of Hypotheses

Hypotheses 1: There is no significant difference between public and private sector nurses in the knowledge of covid-19 infection.

Table 4.6: z-test Analysis on the mean responses of public and private sector nurses in the knowledge of covid-19 infection.

Respondents	N	\bar{x}	SD	Std Error	DF	A	z-cal	z-crit	Decision
Private Nurse	268	2.65	0.99	0.07	665	0.05	0.14	1.96	Accepted
Public Nurse	399	2.66	1.08						

Source: Field Survey, (2020)

From the z-test in Table 6, the t-calculated value of 0.14 is less than t-critical value of 1.96 at 0.05 levels of significance and 665 degree of freedom. The null hypothesis is accepted.

Hypotheses 2: There is no significant difference in the quality and quantity of personal protective equipment supply to nurses in the public and private health care sector.

Table 4.7: z- test Analysis on the mean responses of the quality and quantity of personal protective equipment supply to nurses in the public and private health care sector

Respondents	N	\bar{x}	SD	Std Error	DF	α	z-cal	z-crit	Decision
Private Nurse	268	2.85	0.92	0.07	665	0.05	4.71	1.96	Rejected
Public Nurse	399	3.18	0.94						

Source: Field Survey, (2020)

From the z – test in Table 7, the calculated value is 4.71 while the z – critical value is 1.96 at 0.05 level of significance. The z – calculated value is greater than z– critical value, the null hypothesis is therefore Rejected.

Hypotheses 3: There is no significant difference in the effectiveness of the personal protective equipment in the prevention of infection amongst nurses in the public and private health sectors.

Table 4.8: Z-test Analysis on the Mean Responses of the effectiveness of the personal protective equipment in the prevention of infection amongst nurses in the public and private health sectors

Respondents	N	\bar{x}	SD	Std. Error	DF	A	z-cal	z-crit	Decision
Private Nurse	268	3.47	0.78	0.06	665	0.05	4.83	1.96	Rejected
Public Nurse	399	3.18	1.06						

Source: Field Survey, (2020)

From the z–test in table 8, the t–calculated value of 4.83 is greater than t–critical value of 1.96 at 0.05 levels of significance and 665 degree of freedom. The null hypothesis is accepted.

Hypotheses 4: There is no significant difference in the knowledge of proper use of personal protective equipment amongst nurses in the public and private health sectors.

Table 4.9: Z-test Analysis of Mean Ratings on the knowledge of proper use of personal protective equipment amongst nurses in the public and private health sectors.

Respondents	N	\bar{x}	SD	Std. Error	DF	A	z-cal	z-crit	Decision
Private Nurse	268	2.88	0.96	0.08	665	0.05	2.14	1.96	Rejected
Public Nurse	399	3.03	0.94						

Source: Field Survey, (2020)

From the z–test in table 9, the z–calculated value of 2.07 is greater than z–critical value of 1.96 at 0.05 levels of significance and 665 degree of freedom. The null hypothesis is Rejected.

Hypotheses 5: There is no significant difference in the fear and anxiety amongst public and private health care nurses to the use of the personal protective equipment.

Table 4.10: z- test Analysis on the fear and anxiety amongst public and private health care nurses to the use of the personal protective equipment.

Respondents	N	\bar{x}	SD	Std. Error	DF	α	z-cal	z-crit	Decision
Private Nurse	268	2.85	0.92	0.07	665	0.05	4.71	1.96	Rejected
Public Nurse	399	3.18	0.94						

Source: Field Survey, (2020)

From the z – test in Table 10, the calculated value is 4.71 while the z – critical value is 1.96 at 0.05 level of significance. The z – calculated value is greater than z– critical value, the null hypothesis is therefore rejected.

DISCUSSION OF FINDINGS

The findings revealed that Corona virus disease (COVID-19) pandemic is a global public health concern and the most current topic of discussion across every facet of life, especially among the healthcare workers and patients. Finding is consistent with the finding of a related study conducted by Olowookere, Abioye-Kuteyi, Adepoju OK, Esan & Adeolu (2015), opined that COVID-19 is transmitted by direct contact with infected persons. The virus may be more dangerous in patients with chronic diseases.

COVID-19 is transmitted by dealing with domestic animals. Most of the participants identified colleagues and social media as the major sources of information about COVID-19 pandemic. Almost all the participants knew that the disease can be transmitted from one person to another and that once infected, death is not imminent. Most of the participants agreed that COVID-19 cannot be confirmed without a laboratory test.

Based on findings it was revealed that the fear of healthcare workers towards COVID-19 pandemic is reinforced by inadequate work place safety and inadequate hospital infection prevention and control policy. Consequently, majority of the participants strongly agreed that there was high possibility of getting the infection in the hospitals. These findings are in agreement with finding in a similar study conducted by Zegarra, Chino & Ames (2020)). There was inadequate disease surveillance policy put in place by the government, though in Rivers State, the government strongly enforced the lockdown period to curtail the spread of the disease. Majority of the participants strongly disagreed that there was adequate testing centers and contact tracing as at the time of this study.

CONCLUSION

Based on findings of this study it is concluded that counselor seeks to inform nurses of the right PPE to use, depending on their care setting and the procedures undertaken. Counselor provides extensive instruction on the use of PPE for standard care or when carrying out an AGP, or working in an area of high risk, during the COVID-19 pandemic. Appropriate and timely provision of effective PPE, alongside strict hand hygiene, will contribute to reducing the impact of COVID-19 in both human and economic terms. Whenever the vaccine is available, it should be mandatory for all health care professionals

Also, financial insecurity should be addressed by providing insurance coverage for all health worker. Even, the hazard allowance should be increased as these will boost the morale of the workers and encourage them to function effectively and maximally

RECOMMENDATIONS

Based on above conclusions, it is recommended that:

1. The need for government to adequately supply PPE is paramount in protecting patients and Nurses
2. Treatment of confirmed cases should be initiated promptly following the recommended treatment protocol of the state (Self-medication should be avoided).
3. PPE guidance in relation to COVID-19 has been updated in order to ensure healthcare professionals use PPE effectively to ensure their own and patient safety, to maximise efficient use of PPE resource
6. Nurses should ensure they are familiar with the updated PPE guidelines, relevant to their area of practice, alongside local policy to ensure the appropriate use of PPE and to limit risk of COVID-19 transmission

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