Awareness and Attitude towards Proper Use of Personal Protective Equipment Against Covid-19 Disease Among Nurses at Federal Teaching Hospital, Ido-Ekiti, Ekiti State, Nigeria.

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Abstract

In the wake of the ravaging COVID-19 pandemic, the importance of appropriate use of personal protective equipment (PPE) among nurses cannot be over-emphasized in the prevention of the infection. This paper therefore investigated the awareness and attitude towards proper use of personal protective equipment in the prevention of COVID-19 infection among nurses at the federal teaching hospital, Ido-Ekiti. It adopted descriptive research survey to study a sample of 50 nurses consisting of 25 nurses from the surgical wards, 23 from medical wards and 2 from the isolation ward in line with their numerical strengths. A self-developed structured questionnaire tagged Awareness of Proper use of Personal Protective Equipment Questionnaire (PPEQ) was used for the study after being validated by experts and pre-tested for reliability yielding 0.89 index and the instrument was administered by the researcher. The data were analysed using descriptive statistics of percentage, mean, scores and standard deviation, while inferential statistics of Regression analysis was used. The findings of this study showed that the level of awareness and positive attitude towards proper PPE utilization was high and of significant value among nurses working at federal teaching hospital, Ido-Ekiti. It is recommended that nurses, other health workers and patients should be provided with appropriate PPE. Periodic training and re-training should be organized for nurses and other health workers on the proper donning and doffing of PPE.

Introduction

Corona virus is any family of Coronaviridae of single-stranded RNA viruses that have a lipid envelope studded with club-shaped projections, they infect birds and many mammals including humans, and include MERS, SARS and COVID-19. Corona viruses can cause a variety of illnesses in animals, but in people corona viruses cause one-third of common colds and sometimes respiratory infections in premature infants. The ongoing outbreak of corona virus

pandemic has claimed 765,864 lives, along with 21,472,580 confirmed cases globally, as of 15th August, 2020 (Worldometer Global Covid-19, 2020). The number of deaths associated with COVID-19 greatly exceeds the other two coronaviruses (Severe Acute Respiratory Syndrome Coronavirus, SARS-CoV, and Middle East Respiratory Syndrome Coronavirus, MERS-CoV), and the outbreak is still ongoing, which posed a huge threat to the global public health and economics. In Nigeria, as at 15th August, 2020 about 48,445 people have been infected with 973 fatalities.

The International Council of Nurses (ICN), on the 6th June, 2020, reported that at least 90,000 healthcare workers have been infected by COVID-19 and more than 260 nurses have lost their lives to the pandemic, warning that the number could be much higher. These figures are based on data from just 30 countries showing that 6% of all confirmed cases of the deadly virus occur among health workers. On the 3rd of June, 2020 the Director General of Nigeria Centre for Disease Control (NCDC), ChikweIhekweazu, revealed that over 812 health care workers have been infected, out of which 29 are personnel of the NCDC. In the same vein, the President of National Association of Nigeria Nurses and Midwives (NANNM), AbdurafiuAdeniji, on Friday, May 15, 2020, disclosed that out of about 1000 nurses that were exposed to coronavirus, 70 have tested positive for the virus, while 6 have died. In consideration of these reports, proper use of PPE will go a long way in preventing nurses against Covid-19, while nurses who use PPE without the consciousness of its proper use still stand the chance of being infected, as proper donning and doffing with other standard precautions are important in preventing the infection.

Personal protective equipment (PPE) are basically fashioned with the intention to prevent users eyes, airways, mucous membranes and personal clothing from coming into contact with disease causing agents such as the novel corona virus disease(COVID-19). The mucous membranes and skin with compromised integrity are routes which are highly susceptible to infectious agents. According to the National Centre for Disease Control interim guidance (2020), the use of Personal Protective Equipment is not a substitute for standard infection prevention and control practices such as the hand washing practice and therefore must be used concurrently.

Personal protective equipment is equipment used to reduce exposure to hazards that may cause severe injuries or illnesses in a workplace, which can result

from contacts with chemical, radiological, physical, aerosols, electrical or mechanical hazards. PPE include respirators or N95 masks, surgical or medical masks, hazmat suite, aprons, goggles or face shields, disposable long sleeve gowns, disposable gloves, ear plugs or muffs, hair covers and shoe covers.

The Occupational Safety and Health Administration (OSHA) reported that in order to ensure proper use of PPE, the equipment should be safely designed and constructed, maintained in a clean and reliable fashion, fit properly, and encouraging its use by health workers. It is the responsibility of employers to provide adequate PPE to their workers and mandate its proper use, train the health workers on when it necessary to use a PPE, the type of PPE that is required for a particular procedure, limitations, proper care, maintenance and safe disposal.

Eye protection goggles or face shield protect the health worker conjunctival mucous membranes from sprays of droplet when in less than one metre away from the patient. When using normal reading glasses, a face shield should be worn over the glasses. Goggles should fit securely while each health worker should have his/her personal goggle or face shield to prevent cross infection. Surgical or medical mask is meant for mouth and nose protection, in order to achieve infection source control, all patients with respiratory infection requires a nose mask and health workers must use a medical mask to cover their mouth and nose to avoid droplet spray when within less than one metre to patients.

Respirators remove particulate matter from the air using a filter that mechanically stops them from the wearer's nose and mouth. Examples of respirator is the US standard N95 mask which filters at least 95% of airborne particles and the European standard FFP2 mask which filters at least 94% of airborne particles. A respirator should always be used when performing aerosol-generating procedure in a covid-19 patient. Gloves made of latex should be used to protect hands against contact with respiratory and other body fluids, for every patient, a new pair of gloves should be worn to prevent a spread of infection from one patient to another, and the face, eyes, nose or mouth should not be touched with gloved hands. Body protection gown such as the Hazmat suit is a piece of personal protective equipment that consists of an impermeable whole-body garment worn as a protection against hazardous materials, where the hazmat suit is unavailable, long-sleeved water resistant gowns should be worn in the care of suspected covid-19 patients. The gown does not need to be sterile except when

used in a sterile environment such as the theatre.

Apron is used where water-resistant gowns are unavailable, in such instance, single-use plastic aprons can be used on top of the non-water-resistant gowns to prevent body contamination. Head cover is used to protect the skin and hair from virus contamination with further spread to the mucosa of the eyes, nose or mouth. Heavy duty elbow-length rubber gloves are used by cleaners, laundry personnel, health workers when dealing with infectious waste.

There is no doubt that the COVID-19 pandemic poses an enormous risk to the health and safety of nurses working at the Federal Teaching Hospital, Ido-Ekiti. The nurses may be vulnerable to coronavirus if they are not adequately protected. The best way to prevent infection and spread of COVID-19 among the nurses is to avoid being exposed to the virus by using personal protective equipment and compliance to other safety measures as highlighted by the National Centre for Disease Control. It is against this background that the study was designed to investigate the awareness and attitude towards proper use of PPE against COVID-19 disease among nurses at the Federal Teaching Hospital, Ido-Ekiti.

Objectives of the Study

The study is specifically designed to:

1) determine the level of awareness on proper use of PPE among nurses working in Federal Teaching Hospital, Ido-Ekiti;
2) determine the attitude towards proper use of PPE among nurses working in Federal Teaching Hospital, Ido-Ekiti.

Research Questions

The following research questions are generated to guide the study:

1) What is the level of awareness of the proper utilisation of PPE among nurses working in Federal Teaching Hospital, Ido-Ekiti ?
2) What is the attitude of nurses towards proper utilization of PPE in Federal Teaching Hospital, Ido-Ekiti ?

Research Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance

1) Level of awareness of nurses will not predict the proper utilization of PPE in the prevention of COVID-19 disease at the Federal Teaching Hospital, Ido-Ekiti.
2) Attitude of nurses will not predict proper utilization of PPE in the prevention of COVID-19 disease at the Federal Teaching Hospital, Ido-Ekiti.

Methodology

The descriptive research design of the survey type was used in this study. The research design was found to be appropriate due to its ability to allow information to be obtained from a representative sample of the population. The population of the study consisted of 325 nurses working at the Federal Teaching Hospital, Ido-Ekiti, Ekiti State, Nigeria. Simple random sampling method was used to select 50 nurses for the study while stratified sampling technique was used to divide them according to assigned ward, surgical ward, medical ward and isolation ward, 25 nurses from surgical wards, 23 nurses from medical wards and 2 nurses from the isolation ward of the hospital.

A self-developed structured questionnaire tagged Awareness of Proper use of Personal Protective Equipment Questionnaire (PPEQ) was used for the study. The questionnaire was divided into four sections. Section A contained demographic characteristics of the respondents such as gender, religion, area of specialty and years of experience. Section B determined the level of awareness of PPE use among nurses working in Federal Teaching Hospital, Ido-Ekiti. It consisted of some questions on level of awareness of which the respondents must indicate either 'True' or 'False'; while Section C considered the attitude of nurses towards proper use of PPE. It consisted of questions on attitude of nurses to the use of PPE of which the respondents must indicate either Strongly Agree(SA), Agree (A), Disagree(D) or Strongly Disagree(SD). The validity of the instrument was ensured by experts in Health Education, Tests and Measurements, Guardian and Couselling departments of the Ekiti State University, Ado-Ekiti and Nursing and Clinical departments of the Federal Teaching Hospital, Ido-Ekiti. The nurses working at the Ekiti State University Teaching Hospital were used for the pilot study, where 20 respondents with the same characteristics as those in the actual study were involved. The test was administered twice to the respondents, the scores from the two sets of responses were analysed using Pearson's Product Moment Correlation to determine its reliability co-efficient which yielded 0.89. This was high enough for the study.

The copies of questionnaire were administered to the nurses personally by the researcher after obtaining the permission from the hospital authority. All the copies of the administered questionnaire were returned. The data were analysed using descriptive statistics of frequency counts, percentages, mean and standard deviation. The criterion mean

set for the study was 1.50 and 2.50 respectively. The hypotheses formulated were tested using Regression Analysis at 0.05 level of significance.

Results

Table 1: Demographic Analysis of Respondents.

Demographic Variables	Frequency	Percentage
Gender		
Male	16	32.0
Female	34	68.0
Religion		
Christianity	40	80.0
Islam	10	20.0
Area of specialty		
Medical unit	23	46.0
Surgical unit	25	50.0
Isolation unit	2	4.0
Years of experience		
1-5 years	9	1.8
6-10 years	10	20.0
11-15 years	10	20.0
16 years and above	21	42.0

The socio-demographic characteristics of the respondents were revealed in Table 1. The table shows that more than half of the nurses (68.0%) at the Federal Teaching Hospital, Ido-Ekiti, Ekiti State were female. Most of the respondents (80.0%) were Christians. Half of the respondents (50.0%) were drawn from the surgical Unit while majority of respondents had 16 years and above working experience.

Question 1: What is the level of awareness of the proper utilization of PPE among nurses working in Federal Teaching Hospital, Ido-Ekiti?

Table 2: Level of awareness of the proper utilization of PPE among nurses working in Federal Teaching Hospital, Ido-Ekiti

S/N	ITEM	TRUE	FALSE	MEAN
1	Face shield or goggles adequately protect nurses conjunctival mucous membrane when close to Covid-19 patients	41(82.0)	9(18.0)	1.82
2	Normal reading glasses can be used in place of face shield/goggle	5(10.0)	45(90.0)	1.90
3	Every nurse should have personal face shield/goggle with his/her name on them	48(96.0)	2(4.0)	1.96
4	Only patients with respiratory symptoms should wear a mask as part of source control	4(8.0)	46(92.0)	1.92
5	Nurses should use medical mask when in close proximity to patients	43(86.0)	7(14.0)	1.86
6	Respirators like N95 mask should be worn by nurses when attending to all patients whether Covid-19 positive or not	33(66.0)	17(34.0)	1.66
7	Latex gloves protect hands from both direct and indirect contacts with respiratory fluids and other body fluids	45(90.0)	5(10.0)	1.90
8	A new pair of gloves should be for every patient	48(96.0)	2(4.0)	1.96
9	Sterile gloves are only required for invasive procedures such as in the theatre	41(82.0)	9(18.0)	1.82
10	Hazmat suite/gown should be used in the care of suspected or confirmed Covid-19 patients	47(94.0)	3(6.0)	1.94
11	The gowns may not be necessarily sterile, except when required in a sterile environment like the theatre	39(78.0)	11(22.0)	1.78
12	Where water-resistant gown like hazmat suite is not available, a plastic apron can be used on top of the non-water resistant wear	43(86.0)	7(14.0)	1.86
13	Head cover protects the skin and hair from virus contamination which may spread to the face, eyes, nose or mouth	44(88.0)	6(12.0)	1.88
14	Heavy duty elbow-length rubber gloves are necessary for nurses when handling infectious wastes	39(78.0)	11(22.0)	1.78

Table 2 shows that the mean scores vary by items. Using a cutoff mean score of 1.50 for the rating scale, each of the items had a mean score above the cutoff point. This implies that the level of awareness of the proper utilization of PPE among nurses working in Federal Teaching Hospital, Ido-Ekiti was high.

Question 2: What is the attitude towards proper PPE utilization by nurses working in Federal Teaching Hospital, Ido-Ekiti?

Table 3: Attitude towards proper PPE utilization by nurses working in Federal Teaching Hospital, Ido-Ekiti

S/N	ITEMS	SA	A	D	SD	MEAN
1	Nurses are provided with adequate PPE	4(8.0)	11(22.0)	20(40.0)	15(30.0)	2.92
2	Nurses already have experience on proper PPE donning and doffing	3(6.0)	20(40.0)	16(32.0)	11(22.0)	2.7
3	I feel well supported by the hospital with all the concerns and requirements I needed at this time	3(6.0)	16(32.0)	9(18.0)	22(44.0)	3.0
4	With the provision of PPE by the hospital, I feel good to come to work at this crucial period	6(12.0)	25(50.0)	9(18.0)	10(20.0)	2.54
5	Despite provision of PPE, I am still worried about contracting Covid-19 while discharging my duties	13(26.0)	23(46.0)	14(28.0)	-	2.98
6	Despite the use of PPE, I am still worried about transmitting the disease to my family by coming to work	11(22.0)	24(48.0)	15(30.0)	-	2.92

Table 3 shows the attitude towards proper utilization of PPE by nurses working in Federal Teaching Hospital, Ido-Ekiti. The results show that using a cutoff mean score of 2.50 for the rating scale, each of the items had a mean score above the cutoff point. This implies that the nurses working in Federal Teaching Hospital, Ido-Ekiti had positive attitude towards proper PPE utilization.

Testing of Hypotheses

Hypothesis 1: Level of awareness will not predict the proper utilization of PPE by nurses at the Federal Teaching Hospital, Ido- Ekiti.

Table 4: Level of awareness on proper utilization of PPE by nurses

Model	Unstandardised Coefficients		Standardised Coefficients	t	p
	B	Std. Error	Beta		
(Constant)	12.962	6.522		1.982	.053
Level of awareness of PPE	1.077	.266	.505	4.056	.000

Multiple R= 0.505, Multiple R2= 0.255, Adjusted R2= 0.240, F1,48= 16.448*p<0.05

Table 4 shows that there was a significant influence of level of awareness on proper utilization of PPE by nurses (t =4.056*, p<0.05). The null hypothesis was rejected. The result shows that there was a significant positive but moderate multiple correlation between the predictor variable (level of awareness) and proper utilization of PPE) r=0.505, p<0.05). The value of the coefficient of determination (r2=0.255) indicates that the predictor variable accounted for 25.5% (r2 X 100) of the observed variance in the proper utilization of PPE while the remaining 74.4% unexplained variation was largely due to other variables outside the regression model. The calculated F-ratio (16.448) was significant at 0.05 level of significance. This implies that the predictor variable provides a significant explanation for the variation in the proper use of PPE by nurses at the Federal Teaching Hospital, Ido-Ekiti. The regression equation showing the relationship between the dependent and independent variables can therefore be given as follow:

Y = 12.926 + 1.077X

Where

X = Level of awareness

Y = Proper utilization of PPE

b = Regression Weight Coefficient

a = Constant (other variables other than X)

Hypothesis 2: Attitude of nurses will not predict proper utilization of PPE in the prevention of COVID-19 disease at the Federal Teaching Hospital, Ido-Ekiti

Table 5: Regression analysis showing the influence of attitude on proper utilization of PPE by nurses

Model	Unstandardized Coefficients		Standardized Coefficients	T	p
	B	Std. Error	Beta		
(Constant)	24.183	1.176		20.568	.000
Attitude	1.023	.078	.883	13.063	.000

Multiple R= 0.883, Multiple R2= 0.780, Adjusted R2= 0.776, F1,48= 170.638*p<0.05

Table 5 showed that there was significant influence of level of attitude on proper utilization of PPE by nurses (t =13.063*, p<0.05). The null hypothesis was rejected. The result showed that there was a significant positive and high multiple correlation between the predictor variable (attitude) and proper utilization of PPE) r=0.883, p<0.05). The value of the coefficient of determination (r2=0.780) indicates that the predictor variable accounted for 78% (r2 X 100) of the observed variance in the proper utilization of PPE while the remaining 22% unexplained variation was largely due to other variables outside the regression model. The calculated F-ratio (170.638) was significant at 0.05 level of significance. This implies that the predictor variable provides a significant explanation for the variation in the proper use of PPE by nurses at the Federal Teaching Hospital, Ido-Ekiti. The regression equation showing the relationship between the dependent and independent variables can therefore be given as follow:

Y = 24.183 + 1.023X

Where

X = Attitude

Y = Proper utilization of PPE

b = Regression Weight Coefficient

a = Constant (other variables other than X).

Discussion

The study examined awareness and attitude towards proper use of personal protective equipment, in the prevention of covid-19 disease among nurses working at the Federal Teaching Hospital, Ido-Ekiti, Ekiti State, Nigeria; the findings revealed that the level of awareness of the proper utilization was high among the nurses (t=4.056, p<0.05).This finding is in tandem with the report of Abuobaida (2019) who showed a high level of awareness among his respondents due to the mandatory use of PPE as directed by authorities in Saudi Arabia. However, the finding contradicted the studies of Ahmed and Khamis (2013) and Hakim,et.al. (2016) who opined that the level of awareness of the proper use of PPE was relatively low among his respondents. Availability and mandatory use of PPE is key in the determination of its level of awareness among the respondents. The finding also opposed the report of Archana (2018) that showed that despite the significance high level of awareness on proper utilization of PPE among doctors, nurses and other health care professionals, there was still inappropriate use of PPE, emphasizing that periodic re-training is needed.

The result of the findings of this study showed that nurses had a positive attitude towards proper PPE utilization

(t=13.063, p<0.05). This finding is consistent with the finding of Dimie, Kemebradikumo, Babatunde, George, Christian and Sanusi (2015) who showed that nurses believed that PPE use will prevent them from acquiring hospital based infection. However, the finding of the study contradicted the report of Georgios, Evridiki, Vasilios and Anastasios (2011) who revealed that nurses exhibited negative attitude to PPE use by not having enough time to don PPE when faced with urgent situation to safe patients' life. This finding was also opposed to the finding of Ayinde, Usman, Aduroja and Gbolahan (2020) which reported that though overall attitude was significantly satisfactory, however the practices of Health Care Workers on the use of PPE was not satisfactory.

Conclusion and Recommendations

The findings of this study showed that the level of awareness on the proper PPE utilization was high. Similarly, there was a positive attitude towards proper PPE use. It is recommended that nurses should be provided with appropriate PPE. Also, periodic training and re-training should be organized for nurses, essentially on the proper use of PPE as a measure to prevent the spread of COVID-19.

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