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Attitude and compliance of nurses to standard precautions to infection control in Ekiti State, Southwest Nigeria

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Abstract

The attitude and compliance to standard precautions (SP) by nurses have been recognized as efficient and effective means to prevent and control infections among patients and healthcare workers. This study investigated nurses' attitude and compliance to standard precautions in tertiary hospitals in Ekiti State, Southwest Nigeria. A cross-sectional, descriptive research designs using purposive sampling techniques were used. Adapted and standardized instruments were used to elicit information from 137 nurses. Data were analyzed using descriptive and inferential statistics. Participants' age was between 21 and 62 years, with a mean age of 33.54± 9.41 years; 85.4% were females; while the majority had five to ten years working experience. Participants had poor attitude toward SP, but with good compliance (96.6%). All participants (100%) had good compliance with the use of personnel protective equipment, while most had good compliance with hand hygiene, respiratory hygiene, safety injection practice, clean environment, and sterilization of instruments. The ward/unit allocation of the nurses had a significant positive effect (R= 0.225, p= 0.008) on compliance with respiratory hygiene. Hence, sensitization programs should be intensified to ensure that health workers understand and comply with infection control through the use of SP. *(Afr J Reprod Health 2023; 27[6s]: 60-69).*

Keywords: Infection control, patients, healthcare workers, hygiene, nurses

Résumé

L'attitude et le respect des précautions standard (PS) par les infirmières ont été reconnus comme des moyens efficients et efficaces pour prévenir et contrôler les infections chez les patients et les travailleurs de la santé. Cette étude a examiné l'attitude des infirmières et le respect des précautions standard dans les hôpitaux tertiaires de l'État d'Ekiti, au sud-ouest du Nigéria. Un plan de recherche transversal et descriptif utilisant des techniques d'échantillonnage raisonné a été utilisé. Des instruments adaptés et standardisés ont été utilisés pour obtenir des informations auprès de 137 infirmières. Les données ont été analysées à l'aide de statistiques descriptives et inférentielles. L'âge des participants était compris entre 21 et 62 ans, avec un âge moyen de 33,54 ± 9,41 ans; 85,4 % étaient des femmes; tandis que la majorité avait cinq à dix ans d'expérience professionnelle. Les participants avaient une mauvaise attitude envers la SP, mais avec une bonne observance (96,6 %). Tous les participants (100 %) respectaient bien l'utilisation de l'équipement de protection individuelle, tandis que la plupart respectaient bien l'hygiène des mains, l'hygiène respiratoire, les pratiques d'injection de sécurité, l'environnement propre et la stérilisation des instruments. L'affectation service/unité des infirmières a eu un effet positif significatif (R = 0,225, p = 0,008) sur le respect de l'hygiène respiratoire. Par conséquent, les programmes de sensibilisation doivent être intensifiés pour s'assurer que les agents de santé comprennent et respectent le contrôle des infections grâce à l'utilisation de la SP. *(Afr J Reprod Health 2023; 27[6s]: 60-69).*

Mots-clés: Contrôle des infections, patients, travailleurs de la santé, hygiène, infirmières

Introduction

Standard precautions (SP) are sets of infection control practices or strategies used to prevent transmission of diseases that can be acquired through contact with blood, body fluids, non-intact skin, and mucous membranes[1]. These sets of precautions are deigned to prevent, and minimize

accidental transmission of known and unknown pathogens including HIV, hepatitis B virus, and hepatitis C virus to and from health care personnel when providing health care services[2]. According to the WHO, hospital acquired infections are the most frequent adverse events in health care delivery worldwide as millions of patients are affected worldwide each year, leading to significant mortality and financial losses for the healthcare systems[3].

The compliance of nurses with standard precautions has been recognized as an efficient means to prevent and control cross-transmission of health associated infections to patients[4]. Several studies have reported that positive attitudes towards SP among health care personnel was one of the predictors of better compliance[5-7]. Several studies have been conducted on knowledge, attitude and compliance with SPs in both developed and developing countries[8-10]. Despite these studies and the application of relevant interventions, compliance with SP has been reported to be suboptimal[11,12]. Some factors that contribute to non-compliance with SP include lack of understanding and poor attitude among nurses on ways to make use of SP strategies[13].

Studies on standard precautions are increasing all over the world. However, limited attention has been paid to investigating nurses' attitude and compliance with standard precautions within certain localities, especially in resource-poor countries. Thus, this study aims to determine the attitude and compliance of nurses to standard precaution within health institutions in Ekiti State.

Methods

Study design

A cross sectional, descriptive research designs using purposive sampling technique was used, to describe nurses' attitude and compliance to standard precautions at tertiary hospitals in Ekiti-State.

Setting and population

The study population consisted of nurses working in the medical and surgical wards of the three tertiary hospitals in Ekiti-State, Nigeria. The three selected teaching hospitals comprised of Ekiti State University Teaching Hospital, Ado-Ekiti; Federal Teaching Hospital, Ido-Ekiti and Afe Babalola University Multisystem Hospital, Ado-Ekiti. Two out of the three tertiary hospitals are located in the state capital, Ado-Ekiti while the third hospital is located at Ido-Osi local government area of the State (Ido-Ekiti).

Ethical considerations

Before the study, the researcher submitted proposal to the selected teaching hospitals and obtained permission to conduct the research (EKSUTH/A67/2021/02/022, ERC/2021/03/30/530A). An official letter was also written to the selected teaching hospitals and permission letters were obtained from the Head of Nursing Services. Before the interview, each participant's rights were explained and written informed consent was obtained. To guarantee privacy, the questionnaire was distributed individually to each participant.

Selection and description of participants

Consecutive and purposive sampling method was used to select participants which were nurses from the medical and surgical units of the three tertiary hospitals. According to the record obtained from the three tertiary hospitals, the total population of nurses was 140. Sixty nurses were from Federal Teaching Hospital, Ido-Ekiti; 58 were from Ekiti State University Teaching hospital while 22 were from Afe Babalola University Multisystem Hospital. The total population of nurses from the three tertiary hospitals were consecutively used as the sample size. All available nurses on all shifts who accepted to participate in the study had their data collected. However, 137 out of the 140 nurses completely filled and returned the questionnaires. Three questionnaires were incompletely filled and thus, were excluded from analysis making the final sample size to be 137 participants. The inclusion criteria included:

1) Participants must be a professional nurse
2) Participants must work only in the medical and surgical wards
3) Participants must be willing to participate in the study

Before the data collection, the researcher visited the selected settings for introduction, approval and seeking appointment for collection of data. Then an appointment was booked with the heads of the wards to ascertain the availability of the nurses. The purp\ose of the research was explained to the participants by the researcher, clarifications and explanations were made. The participants were assured of absolute confidentiality of any information provided. All the participants gave their written informed consent. A total of 140 questionnaires were administered out of which 137 were properly filled and retrieved by the researcher.

Instrument and data collection

Two standardized questionnaires were adopted as the research instrument for the study. Standard Precautions guidelines of CDC[14], Compliance with SP Scale (CSPS) and Knowledge, Attitudes and Practices Model[15]. The questionnaire had eight sections: The first part (Section A) included questions on participants' demographic data such as age, gender, level of education, years of nursing experiences, place of work, nursing status, wards, no of hospital beds in the ward. While Section B was designed to ascertain the attitude of nurses towards standard precautions. Section C was designed to elicit information on the compliance of nurses with hand hygiene component of SP. Section D was on questions regarding nurses' compliance with the use of proper protective equipment/gadgets (PPE). Section E enquired about nurses' compliance with proper safety box use while Section F had questions on nurses Compliance with Respiratory Etiquette. Section G was on nurses Compliance with Clean and Disinfected Environmental Surface and the final aspect (Section H) of the questionnaire had questions on nurses Compliance with Sterilization of Instruments.

After ethical permission, Directors of Nursing Services in the three selected hospitals were communicated; The researchers visited the selected settings for introduction, approval and seeking appointment for collection of data. The purpose of the research was explained to the participants, clarifications and explanations were made before the administration of the instrument. Nurses working in the medical and surgical units of the hospitals participated in the study. Data collection was done daily during each shift for 12 weeks between December 2021 and February 2022. Assented nurses completed the questionnaire during their break periods using an average of 35 – 45 minutes, completed questionnaires were collected and collated.

Data analysis

Data collected were stored and analyzed using statistical package for Social Sciences Software Package (SPSS Version 25) Chicago, Illinois, USA. Analysis of socio-demographic variables such as age, sex, and educational attainment were expressed in frequencies and percentages. The Inferential statistics used were chi-squares and regression. Statistical significance was inferred at $p < 0.05$.

Results

Sociodemographic characteristics

Table 1 shows the socio-demographic characteristics of the respondents. A total of 137 questionnaires were retrieved. The nurses' ages ranged from 21 to 62 years with a mean age of 33.54± 9.41 years. Most (46%) of the respondents belonged to the common age range of 21-30 years while very few (5.1%) were aged 50 years and above. The respondents were predominantly females (85.4%) giving a male to female ratio of 1:6. Majority (71.5%) of them had a graduate degree in nursing education while few (12.4%) of them had a post graduate qualification. A larger proportion of the respondents were senior nursing officers SNO (29.9%) followed closely by Nursing officer II (NO II) (24.4%). Only one respondent (0.7%) was a chief nursing officer CNO. A good number (38.7%) of the nurses had about five to ten years of experience followed by those (29.2%) with two to five years of experience.

Most of the nurses were staff of the Federal Teaching Hospital (44.5%) followed closely by State Teaching Hospital staff (41.6%), only 13.9% of the nurses came from Private Teaching Hospital.

The participants in the three tertiary hospitals had poor attitude to standard precaution (Table 2). The respondents' socio demographic

Table 1: Demographic data of participants (n =138)

Variables	Private hospital (N= 19)	State hospital (N=57)	Federal hospital (N=61)
Age (years)			
21-30	10 (52.6)	29 (50.9)	24 (39.3)
31-40	7 (36.8)	15 (26.3)	21 (34.4)
41-50	1 (5.3)	9 (15.8)	14 (23.0)
Above 50	1 (5.3)	4 (7.0)	2 (3.3)
Gender			
Female	13 (68.4)	43 (75.4)	61 (100.0)
Male	6 (31.6)	14 (24.6)	
Designation			
NO 1	11 (57.9)	5 (3.8)	15 (24.6)
NO 11	4 (21.1)	19 (33.3)	10 (16.4)
SNO	2 (10.5)	18 (31.6)	21 (34.4)
PNO	2 (10.5)	8 (14.0)	12 (19.7)
ACNO	-	7 (12.3)	2 (3.3)
CNO	-	-	1 (1.6)
Highest qualification			
Diploma	3 (15.8)	11 (19.3)	8 (13.1)
First degree	15 (78.9)	37 (64.9)	46 (75.4)
Post graduate	1 (5.3)	9 (15.8)	7 (11.5)
Work experience (years)			
< 2	1 (15.8)	-	8 (13.1)
2-5	9 (47.4)	18 (31.6)	13 (21.3)
5-10	6 (31.6)	18 (31.6)	29 (47.5)
>10	3 (15.8)	21 (36.8)	11 (18.0)
No of beds (units)			
< 10	-	-	1 (1.6)
10-20	4 (21.1)	1 (1.8)	40 (65.6)
21-30	11 (57.9)	50 (87.7)	15 (24.6)
31-40	1 (5.3)	1 (1.8)	-
>50	3 (15. 8)	5 (8.8)	5 (8.2)
Type of unit			
Male medical ward	7 (36.8)	15 (26.3)	16 (26.2)
Male surgical ward	6 (31 .6)	15 (26.3)	18 (29.5)
Female medical ward	-	13 (22.8)	15 (24.6)
Female surgical ward	6 (31.6)	14 (24.6)	12 (19.7)
Training			
No	0	0	1 (1.6)
Yes	19 (100.0)	57 (100)	60 (98.4)

NO I (Nursing Officer I)**, NOII** (Nursing Officer II)**, SNO** (Senior Nursing Officer)**, PNO** (Principal Nursing Officer)**, ACNO** (Assistant Chief Nursing Officer)**, and CNO** (Chief Nursing Officer)

profile did neither influence nor show significances with their attitude towards SP.

Compliance with standard precautions (SP)

Among the participants from federal and private hospital, none of the demographic characteristics predicted compliance with the use of safety boxes. However, qualification level (r= 10.897, p= 0.014) predicted compliance to the use of safety boxes among participants from the state hospital (Table 3). In the case of compliance to clean environment, none of the demographic characteristics was observed to predict compliance among participants from the federal and private hospitals. However, designation (r= 0.473, p= 0.042) was significantly correlated with compliance to clean environment among participants from the state hospital (Table 4).

For compliance with sterilization, working unit (r= 2.462, p= 0.027) predicted compliance among participants from the state hospital. None of the demographic characteristics predicted compliance among participants from the federal and private hospitals (Table 5). Generally, all the

Table 2: Participants' attitude towards standard precautions

Variables	Private hospital				State hospital				Federal hospital			
	Level			Level			Level					
	A	B	X^2	p	A	B	X^2	p	A	B	X^2	p
Age (years)												
21-30	0	10	1.810	0.613	5	24	0.216	0.975	3	21	3.131	0.372
31-40	1	6			3	12			3	18		
41-50	0	1			2	7			4	10		
Above 50	0	1			1	3			1	1		
Gender												
Male	1	5	2.287	0.130	3	11	0.054	0.816	0	0		
Female	0	13			8	35			11	50		
Nursing status												
NO 1	0	11	3.958	0.266	0	5	4.322	0.364	1	14	14.866	0.011
NO 11	1	3			2	17			2	8		
SNO	0	2			4	14			5	15		
PNO	0	2			3	5			0	12		
ACNO	0	0			2	5			2	0		
CNO	0	0			0	0			0	1		
Highest qualification												
Diploma	0	3	0.281	0.869	1	10	9.128	0.010	2	6	0.342	0.843
First degree	1	14			5	32			8	38		
Post graduate	0	1			5	4			1	6		
Working experience (years)												
< 2	1	0	19.000	0.000	0	0	1.148	0.563	2	6	0.875	0.831
2-5	0	9			2	16			8	38		
5-10	0	6			4	14			1	6		
>10	0	3			5	16						
No of bed (units)												
< 10	0	0	0.768	0.857	0	0	5.632	0.131	0	1	2.084	0.55
10-20	0	4			0	1			7	33		
21-30	1	10			10	40			4	11		
31-40	0	1			1	0			0	0		
41-50	0	0			0	5			0	5		
>50	0	4			0	0						
Work unit												
Male medical	0	7	2.287	0.319	3	12	0.355	0.949	2	16	3.306	0.347
Male surgical	1	5			3	12			5	10		
Female medical	0	0			2	12			2	10		
Female surgical	0	6			3	10						
Training												
No	1	18			0	0			0	1	0.224	0.636
Yes	0	0			11	46			11	49		
% Attitude	**5.3**	**94.7**			**19.0**	**80.7**			**18.0**	**82**		

NO I (Nursing Officer I)**, NOII** (Nursing Officer II)**, SNO** (Senior Nursing Officer)**, PNO** (Principal Nursing Officer)**, ACNO** (Assistant Chief Nursing Officer)**, and CNO** (Chief Nursing Officer)

Table 3: Participants' compliance with use of safety boxes

	Variables in the Equation				
Federal hospital	B	S.E.	Wald	Sig.	Exp(B)
Age	-1.067	.551	3.760	.052	.344
Designation	.241	.371	.420	.517	1.272
Qualification	-.680	.730	.866	.352	.507
Years of experience	.216	.492	.193	.661	1.241
Number of beds in facility	-.086	.271	.099	.753	.918
Work unit	.211	.276	.585	.444	1.235
Training	-19.422	40193.279	.000	1.000	.000

State hospital					
Age	.743	.628	1.402	.236	2.103
Designation	-.475	.491	.937	.333	.622
Qualification	2.389	.970	6.059	.014	10.897
Years of experience	.048	.604	.006	.936	1.049
Number of beds in facility	.066	.300	.049	.825	1.069
Work unit	-.247	.328	.568	.451	.781
Training	-20.553	40193.049	.000	1.000	.000
Private hospital					
Age	-.180	1.395	.017	.897	.835
Designation	.366	1.559	.055	.814	1.442
Qualification	.749	.894	.701	.402	2.114
Years of experience	-.033	1.236	.001	.979	.968
Number of beds in facility	-1.218	1.012	1.450	.229	.296
Work unit	.076	.496	.023	.879	1.079
Training	.525	.838	.393	.531	1.690

Table 4: Participants' compliance with clean environment

	Variables in the Equation				
Federal hospital	**B**	**S.E.**	**Wald**	**Sig.**	**Exp(B)**
Age	-.003	.484	.000	.994	.997
Designation	-.301	.342	.773	.379	.740
Qualification	.754	.685	1.210	.271	2.126
Years of experience	-.046	.462	.010	.921	.955
Number of beds in facility	-.025	.261	.009	.924	.975
Work unit	-.026	.258	.010	.920	.974
Training	-21.879	40193.279	.000	1.000	.000
State hospital					
Age	.488	.507	.926	.336	1.628
Designation	-.749	.368	4.138	.042	.473
Qualification	-.086	.663	.017	.897	.918
Years of experience	.297	.458	.422	.516	1.346
Number of beds in facility	.274	.253	1.165	.280	1.315
Work unit	.251	.268	.877	.349	1.285
Training	-22.172	40193.510	.000	1.000	.000
Private hospital					
Age	-45.202	58771.735	.000	.999	.000
Designation	-34.185	7724.208	.000	.996	.000
Qualification	-21.915	57393.474	.000	1.000	.000
Years of experience	14.920	62664.921	.000	1.000	3019172.719
Number of beds in facility	-33.432	6051.324	.000	.996	.000
Work unit	-17.996	5951.334	.000	.998	.000
Training	-.406	5951.334	.000	1.000	.666

participants from the private hospital showed good respiratory hygiene compliance in the respective hospitals. None of the participants' socio-demographic characteristics predicted compliance with respiratory hygiene among the participants from the federal and state hospitals (Table 6). In the case of compliance with safe injection practices, the none of the socio-demographic characteristics predicted compliance among participants from the federal and private hospital. However, qualification (r= 0.001, p= 0.037), was observed to predict compliance with safe injection practices among participants from the state hospital (Table 7).

Discussion

The findings of this study revealed poor attitude of nurses towards standard precaution in all the tertiary institutions. This poor attitude can either be due to a personal factor or external factor such as poor work environment, work place pressure, work

Table 5: Participants' compliance with sterilization

Variables in the Equation					
Federal hospital	**B**	**S.E.**	**Wald**	**Sig.**	**Exp(B)**
Age	.092	1.365	.005	.946	1.096
Designation	1.710	1.382	1.530	.216	5.527
Qualification	-2.225	2.187	1.035	.309	.108
Years of experience	-.784	2.031	.149	.700	.457
Number of beds in facility	-2.004	2.663	.566	.452	.135
Work unit	-.498	.684	.530	.467	.608
Training	-26.450	40193.049	.000	.999	.000
State hospital	B	S.E.	Wald	Sig.	Exp(B)
Age	1.703	.932	3.338	.068	5.493
Designation	-.528	.556	.901	.342	.590
Qualification	.995	1.088	.837	.360	2.705
Years of experience	-1.379	.847	2.651	.103	.252
Number of beds in facility	-2.602	1.370	3.609	.057	.074
Work unit	.901	.407	4.901	.027	2.462
Training	-28.132	40193.050	.000	.999	.000
Private hospital					
Age	2.825	42032.663	.000	1.000	16.862
Designation	-5.015	49637.413	.000	1.000	.007
Qualification	8.542	31282.026	.000	1.000	5127.338
Years of experience	8.773	46652.723	.000	1.000	6458.062
Number of beds in facility	2.351	38200.454	.000	1.000	10.492
Work unit	-16.897	24121.739	.000	.999	.000
Training	-18.692	26469.497	.000	.999	.000

Table 6: Participants' compliance with respiratory hygiene

Variables in the Equation					
Federal hospital	**B**	**S.E.**	**Wald**	**Sig.**	**Exp(B)**
Age	-10.700	6577.346	.000	.999	.000
Designation	2.159	10574.521	.000	1.000	8.660
Qualification	9.793	13116.572	.000	.999	17908.419
Years of experience	18.355	15214.886	.000	.999	93628181.772
Number of beds in facility	13.801	2488.386	.000	.996	985793.749
Work unit	31.415	3642.074	.000	.993	43979557683149.730
Training	-45.738	41197.536	.000	.999	.000
State hospital					
Age	-25.829	4749.325	.000	.996	.000
Designation	8.590	2689.623	.000	.997	5379.975
Qualification	-35.415	11054.002	.000	.997	.000
Years of experience	9.263	8117.365	.000	.999	10538.959
Number of beds in facility	-7.320	5831.532	.000	.999	.001
Work unit	-16.591	4004.768	.000	.997	.000
Training	-2.708	40515.127	.000	1.000	.067

Table 7: Participants' compliance with safe injection practices

Variables in the Equation					
Federal hospital	**B**	**S.E.**	**Wald**	**Sig.**	**Exp(B)**
Age	1.624	.953	2.904	.088	5.074
Designation	.139	.571	.059	.807	1.149
Qualification	-.408	1.199	.115	.734	.665
Years of experience	-1.480	.875	2.859	.091	.228
Number of beds in facility	-.892	1.094	.665	.415	.410
Work unit	-.176	.435	.163	.686	.839
Training	16.040	40192.924	.000	1.000	9246390.917
State hospital					

Age	-.587	1.136	.267	.606	.556
Designation	.297	.780	.145	.704	1.345
Qualification	-6.940	3.336	4.329	.037	.001
Years of experience	3.953	2.814	1.974	.160	52.112
Number of beds in facility	-3.118	1.960	2.532	.112	.044
Work unit	-.837	.900	.865	.352	.433
Training	15.924	40192.991	.000	1.000	8235212.294
Private hospital					
Age	28.623	9794.088	.000	.998	2695554709704.403
Sex	18.147	9118.430	.000	.998	76076032.639
Status	-16.707	5056.366	.000	.997	.000
Qualification	68.191	20501.418	.000	.997	4.1E29
Years of experience	-26.815	9794.088	.000	.998	.000
Number of beds in facility	.125	.703	.032	.858	1.134
Work unit	-1.252	1.430	.766	.381	.286

overload, uncooperative patients, inadequate equipment/facilities and lack of cohesiveness between health teams. The finding was supported by Abudnike[16] who reported a low attitude of 37.3%. A study conducted in a tertiary hospital, South-West[17] and South-East[10], Nigeria however reported a positive attitude of 59.7% and over 90% respectively; although the researcher documented that the outcome of the study may be due to academic knowledge of the participants and not necessary the current attitude.

In addition, none of the respondents' socio-demographic factors was predicted to have effect on attitude to standard precautions. This finding differs from the study conducted by Abudnike *et al*.[16] where except for gender, all other socio-demographic characteristics of the participants revealed a significant relationship.

In reference to the findings of this study, the major factor that negatively affects the nurse's attitude towards carrying out their duties is 'work pressure' due to the poor ratio of nurses to patients in the ward. Thereby, restricting the nurses' ability to perform due nursing practice expected to each patient. Nursing Administrators should proffer ways to curb this anomaly by employing more nurses in the wards and ensuring adequate number of nurses for the rotation during each shift.

The level of compliance to standard precautions practice among the nurses in this study was good across the three tertiary hospitals. Majority of the nurses had good compliance with hand hygiene, use of personal protective equipment's (PPE), sterilization of instruments, respiratory hygiene, safe injection practice, clean and disinfected environmental surface. The findings are different from the previous studies in which the nurses had poor compliance with SP practice[2,18,19]. The nurses' high compliance practice might be due to the pandemic wave of COVID-19 strains. According to the Nigeria Centre for Disease Control (NCDC), as of April 8th 2022, Ekiti-State has 2,004 laboratory confirmed cases of Covid-19 patients.

Hand hygiene is one the most important practice of standard precaution[20]. Hand washing should be done in all circumstances, when hands visibly soiled and not visibly soiled. This study revealed that nurses had good compliance to hand hygiene and use of PPE. Also, the use of PPE was the SP strategy with the highest level of compliance (100%). These findings are similar to other studies in which nurses working in a hospital had good compliance with the use of PPE[13,17]. The most common factor reported to militate against adequate PPE compliance was limited access to necessary materials[19,21,22]. Previously, shortage of basic PPE such as eye shields, face mask, gloves, gowns and shoe covers had been reported as barriers to compliance with SP in several countries including Ghana, Ethiopia, Nepal, Egypt, China, and Malaysia[23].

The current study does not agree with these previous findings as majority of the nurses had high level of compliance with PPE use. The hospital management ensured adequate supply of basic materials required for SP practice such as appropriate PPE, running water, soap, disinfectants and regular electricity among others, probably due to the ravaging effect of Covid-19 pandemic worldwide. Despite good compliance to all SP strategies, compliance with the use of safety box was poor. This outcome may be due to inadequate

training and guidelines on handling of sharps. This finding was similar to Haridi *et al*.[24] but in contrast to other studies that had good compliance[25,26].

Furthermore, most of the participants were female which was in consonance with most previous studies[8,10,17]. The logistic regression analyses of this study showed that qualification, designation (nurse's cadre) and working environment were factors that determined the compliance with standard precaution at the state teaching hospital. It could be deduced that those with higher qualification had better compliance with SP. This is evident as most participants had either a first degree or a postgraduate qualification. Also, it could be inferred that higher nurse's cadre had better compliance than the lower cadre as majority of the participants were senior nursing officers.

Conclusion

The study concluded that nurses have poor attitude towards standard precaution and good compliance with the strategies of standard precaution except with the use of safety box. Therefore, the concepts of nurses' attitude towards standard precaution must be strengthened through educational strategies to enhance a positive attitude towards standard precaution.

Limitations

The scope of this study was limited to the nurses working in the medical and surgical units of the selected tertiary hospitals in Ekiti-State. Thus, the findings of this study cannot be generalized to a larger context in the health care system. Future research needs to involve more nurses and health workers from other sectors of the hospital.

Also, subjective self-reported assessment tool was used. Thus, the nurses reported on the use and compliance with standard precautions. Reporting does not mean that they actually used the methods. However, to overcome this limitation, we ensured confidentiality.

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Conflicts of interest

The authors declared that there are no conflicts of interest.

Author contributions

All authors contributed to conception and design of the study. OEO, FTO, OAA, and OOA provided substantial contributions to the conception and the design of the study, data collection and analysis. Literature review and critical appraisal of included studies was done by IOO, IAO and OO. OAA and OOA supervised the work. IOO, IAA and OO drafted the manuscript. OOA revised it critically. All authors have read and agreed to the published version of the manuscript.

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