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Surgical Healthcare Providers' Compliance to Hand Hygiene and Facemask Use: A Case of Tamale Teaching Hospital, Ghana

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Abstract

Introduction: Efficient infection prevention and control (IPC) measures such as hand hygiene and facemask use are basic requirements for all health facilities to reduce the morbidity and mortality associated with microbial agents and hence excellent patient outcome.

Methodology: This study was conducted using descriptive cross-sectional survey. Data entry and analysis was done using SPSS version 20 and Graph Pad Prism version 6.05 and the level of significance was at confidence level of 95%.

Results: Out of the 156 participants who responded, 22 (14.1%) were Doctors, with 107 (68.6%) Nurses, 12 (7.7%) Certified registered an aesthetics (CRA) and 15 (9.6%) Order lies. Hand hygiene compliance was 49.4% and facemask use compliance was 73.7%. Factors significantly related to hand hygiene compliance were: occupational category ($p = 0.000$), educational level ($p = 0.000$), In-service training/workshop related to IPC ($p = 0.013$) and hospital monitoring of staff adherence to IPC ($p = 0.000$). The factor significantly related facemask use was: occupation ($p = 0.000$), age group ($p = 0.024$), educational level ($p = 0.006$) and hospital monitoring of staff adherence to IPC ($p = 0.002$).

Key word: Infection; Prevention; Control; Hand Hygiene and Facemask

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Introduction

Efficient infection prevention and control (IPC) measures such as hand hygiene and facemask use are basic requirements for all health facilities to reduce the morbidity and mortality associated with microbial agents and hence excellent patient outcome. According to Mathur, the most efficient, easiest and least cost method of infection prevention in a healthcare setting is hand hygiene [1]. Even though hand hygiene is a good way to prevention of infection in a healthcare setting, studies have shown that, on average, healthcare providers do hand hygiene half the number of times they are supposed to clean and this has contributed to nosocomial infections [2]. The purpose of using a face mask is a two-way benefit; first to prevent contamination of the patient wound and secondly to protect healthcare provider from spray or splashes of fluids from the patient. Surgical mask, when used correctly, reduces the risk of SSI [3]. The contributory factors implicated in nosocomial infections are poor knowledge, attitude and practice of IPC among healthcare workers [4].

It has been reported that about 5 to 10.0% of all admitted patients develop nosocomial infections and 70.0% of the identified pathogens are resistant to one or more of the antimicrobial medicine presently in use [5]. Sub-Saharan African countries have a high incidence rate of hospital-acquired infections ranging from 2.0 – 49.0%; this is more so with patients admitted to the critical intensive unit where the rate is estimated to range from 21.2 - 35.6%. The prevalence of hospital-acquired infections in some African countries such as Burkina Faso, Mali, Gabon, Uganda, and Cameroon varies between 1.6% to 28.7% [6]. For instance, prevalence of nosocomial infections in Ghana is reported to be 6.7% [6].

A survey conducted in Ghana among ten hospitals including the Tamale Teaching Hospital on hospital acquires infections reported an overall prevalence rate of 8.2% and that of Tamale Teaching Hospital to be 8.0% the survey further found surgical site infection to be the leading nosocomial infection nationwide [7].

An earlier study in 2014, by Apanga et al., recommended further institution-based research such as work practices of healthcare providers to evaluate or identify other factors accounting for the increased surgical site infection in health facilities, particularly in

the TTH [8]. This stimulated this study to assess hand hygiene and facemask use compliance among surgical healthcare provider of Tamale Teaching Hospital.

Aim of the study

There is no known study that has attempted to identify some of the work practices (IPC) of healthcare providers in the surgical department that could possibly contribute to nosocomial infection; hence the main aim of this study was to assess hand hygiene and facemask use compliance among healthcare workers at the surgical department of Tamale Teaching Hospital.

Methods

This study was conducted using descriptive Cross-sectional survey among healthcare provider at the surgical department of Tamale Teaching Hospital using a survey questionnaire. The sample size for this study was determined using Krejcie and Morgan (1970) sample size determination table. With the known population of 245 (from the report of 2017 annual performance review) the sample size of 160 was used for this study. Stratified random sampling method was used to divide the study population into strata's according to their profession and simple random sampling used to select respondents from each stratum proportionally to their population.

Method of data analysis

Data entry and analysis was done using Statistical Package for the Social Sciences (SPSS) version 20 and Graph Pad Prism version 6.05. Scores for hand hygiene and facemask use compliance were done using a sum score for each respondent. The mean score for each section was used to categorize compliance levels (hand hygiene and facemask use) adopting a similar method used in a study by Kassahun et al., as a guide [9]. And if the mean score for all respondents was below 60% of the maximum expected score, levels were classified into low (if respondent score was less than 60%), moderate (if respondent score is between 60%-80%) and high (if respondent score is greater than 80%) as guided by Bloom's cut off point [10]. In this study all respondents mean scores for compliance scores were above 60% of the maximum expected scores, hence their mean score was used for classification.

Ethical consideration

Approval to conduct this research in the hospital was gained from the research department of hospital after reviewing the proposal and tool for data collection. Respondents' consented to participate in the study and they were made to know that they had the right to skip any question they feel uncomfortable to answer and can draw from participating at any time they will. Confidentiality was assured and any form of harm avoid. All materials used for this study were duly referenced.

Results

A total of 160 questionnaires were administered of which 156 (97.5%) were satisfactorily filled and returned. Table 4.1 represents the demographic characteristics of the respondents. A majority (65.4%) of the 156 respondents were males whiles 34.6% were females (p = 0 .0001) with a male to female of 1.9: 1. The ages of the 156 respondents ranged from 21 to 58 years with a mean age of 32.78 ± 6.17 years and a median age of 32.00. The modal age group was 30 - 39 years (58.3%) followed by 20-29 (30.8%) (p = 0.0001). Many (69.9%) of the respondents were married (p = 0.0001).Majority of the respondents' had tertiary education (91.0%) and the remaining (9.0%) had primary and secondary education (p = 0.0001). With regards to occupation of respondents, the majority were registered general Nurses (68.6%), followed by practicing medical officers (14.1%), then Orderlies (9.6%) and finally Certified registered an aesthetics (CRA) (7.6%) (p = 0.0001).

The years of occupational work experience of respondents range between 0.5 to 31 years with mean 6.49 ± 5.32 years. The majority (73.7%) of the workers had between 0 – 9 years working experience followed by 21.8% with 10 – 19 years of experience (P = 0 .0001). The respondents' years of experience in the surgical department ranged from 0.5 – 25 years with a mean of 3.12 ± 3.00 years. Most (94.9%) of the respondents had between 0 – 9 years of working experience in the surgical department (p <0 .0001) (Table 1).

Availability of IPC materials or services

Under this in the survey questionnaire, five items were examined with regards to the availability of IPC materials or services. The IPC material was either always available or sometimes available or not always available. According to majority (60.9%) of the respondents' hand washing items such as water and soap were always available and the least available IPC material according to 63.5% of the respondents was hand sanitizers (63.5%) P = 0.0001, (Table 2).

Hand hygiene practice

The most performed hand hygiene time was after contact with contaminated equipment or surface. And the least times for hand hygiene (41.7%) p = 0.0040 was: hand hygiene on arrival at work and before wearing gloves (Table 3). Scoring was done by summing up all correct answers in Table 3 for all respondents', each response had a score attached 1 for yes and 0 for no. The mean score for hand hygiene was 4.39 ± = 1.27, the minimum score of 2.00 and a maximum score of 6.00. The most frequent score was 6.00 and the median score of 4.00. The score was used to classified hand hygiene compliance level. More than half (50.6%) of the respondents' had poor compliance to hand hygiene and the remaining 48.4% had good compliance (p = 0.9090).

Facemask use

With facemask use, facemask was mostly ((94.9%), p = 0.0001) used when undertaking procedures likely to generate splashes. And least use was when working with patient with expectoration (Table 4). Scoring was done by summing up all correct answers in Table 4 for all respondents', each response had a score attached 1 for yes and 0 for no. The mean compliance score on facemask use was 3.63 ± 0.68 (range: 1.0 -4.0) with a median and modal score of 4.0. The mean score was used to classified facemask use

Table 1: Socio-demographic characteristic of study respondents.

		Frequency (n)	Percent (%)	P – values
Sex	Male	102	65.4	
	Female	54	34.6	0.0001
	Total	156	100.0	
Age group	20-29	48	30.8	
	30-39	91	58.3	
	40-49	12	7.7	0.0001
	50-59	5	3.2	
	Total	156	100.0	
Marital status	Married	109	69.9	
	Single	47	30.1	0.0001
	Total	156	100.0	
Education level	Primary	6	3.8	
	Secondary	8	5.1	0.0001
	Tertiary	142	91.0	
	Total	156	100.0	
Occupation	Doctor	22	14.1	
	Nurse	107	68.6	0.0001
	CRA	12	7.7	
	Orderly	15	9.6	
	Total	156	100.0	
Duration of Work	0-9	115	73.7	
	10-19	34	21.8	
	20-29	5	3.2	0.0001
	30-39	2	1.3	
	Total	156	100.0	
Duration of work in the surgical department	0-9	148	94.9	
	10-19	7	4.5	
	20-29	1	.6	0.0001
	Total	156	100.0	

Table 2: Respondents' response on availability of IPC materials or services.

IPC material	Response	Frequency	Percentage (%)	*P*-values
Hand washing items (water and soap)	Not always available	5	3.2%	
	Sometimes available	56	35.9%	0.0001
	Always available	95	60.9%	
Hand sanitizers	Not always available	99	63.5%	
	Sometimes available	38	24.4%	0.0001
	Always available	19	12.2%	
Personal protective equipment's such as facemask	Not always available	71	45.5%	
	Sometimes available	48	30.8%	0.0001
	Always available	37	23.7%	
In-service training/workshop related to IPC	Not always available	86	55.1%	
	Sometimes available	64	41.0%	0.0001
	Always available	6	3.8%	
Hospital monitoring of staffs adherence to IPC	Not always available	96	61.5%	
	Sometimes available	42	26.9%	0.0001
	Always available	18	11.5%	

compliance level. Majority (73.7%) of the respondents' had good compliance with regards to facemask use and the remaining 26.3% had poor compliance (p = 0.0001).

The relationship between hand hygiene compliance and respondents demographic characteristics

Among the demographic characteristics occupation of the respondents' was significantly associated with hand hygiene compliance $X^2(3, 156) = 21.069$, p = 0.000. Proportionally nurses had highest (59.8%) percentage of them had good compliance to hand hygiene and those with least percentage were orderlies. Also educational level of the respondents was significantly

Table 3: Respondents' response to hand hygiene practice.

Hand hygiene	Response	Frequency (n=156)	Percentage	*p*-values
After patient contact	Yes	156	100.0	0.0001
After contact with contaminated equipment or surfaces	Yes	150	96.2	0.0001
	No	6	3.8	
On arrival at work	Yes	65	41.7	0.0040
	No	91	58.3	
Before patient contact	Yes	105	67.3	0.0001
	No	51	32.7	
Before wearing gloves	Yes	65	41.7	0.0040
	No	91	58.3	
After wearing gloves	Yes	144	92.3	0.0001
	No	12	7.7	

Table 4: Respondents' response to facemask use.

Response	Frequency (n=156)	Percentage		p-values
When dealing with patients' exposed wound	Yes	145	92.9	0.0001
	No	11	7.1	
Wear a facemask when undertaking procedures likely to generate splashes	Yes	148	94.9	0.0001
	No	8	5.1	
Wear nose mask when working within 1-2 metres of patients with expectoration	Yes	132	84.6	0.0001
	No	24	15.4	
Never reuse disposable nose mask	Yes	142	91.0	0.0001
	No	14	9.0	

Table 5: Chi-square analysis of hand hygiene compliance and respondents demographic characteristics.

		Hand hygiene compliance level		Total	X^2	df	p-value
		Poor	Good				
Sex of respondents	**Male**	55	47	102	1.269	1	0.260
	Female	24	30	54			
Total		79	77	156			
Marital Status	**Married**	56	53	109	0.078	1	0.780
	Single	23	24	47			
Total		79	77	156			
Occupational category	**Doctor**	14 63.6%	8 36.4%	22	21.069	3	0.000
	Nurse	43 40.2%	64 59.8%	107			
	CRA	7 58.3%	5 41.7%	12			
	Orderly	15 100.0%	0 0.0%	15			
Total		79	77	156			
Educational level	**Lower**	14 100.0%	0 0.0%	14	14.991	1	0.000
	Higher	65 45.8%	77 54.2%	142			
Total		79	77	156			
Age groups	**20-29**	20	28	48	3.695	2	0.158
	30-39	52	39	91			
	40-59	7	10	17			
Total		79	77	156			
Years of occupational experience	**Less than 10 years**	60	55	115	0.411	1	0.521
	10 years and above	19	22	41			
Total		79	77	156			
Years of departmental experience	**Less than 10 years**	76	72	148	0.583	1	0.445
	10 years and above	3	5	8			
Total		79	77	156			

associated with their hand hygiene compliance X^2 (1, 156) = 21.069, p = 0.000. All those with lower educational level (below tertiary) had poor compliance to hand hygiene. However the remaining demographic characteristics were not significantly associated with hand hygiene compliance (P > 0.5) (Table 5).

The relationship between hand hygiene compliance and IPC materials or services availability

With IPC material or services availability, in-service training or workshop related to infection prevention and control was significantly related hand hygiene compliance X^2(2, 156) = 8.660, p = 0.013. Higher (83.3%) percentage of those with IPC materials or services available to them had good compliance to hand hygiene, followed by sometime available (59.4%) and lastly (39.5%) not always available. Also, availability of hospital monitory of staff adherence to IPC X^2 (2, 156) = 15.413, p = 0.000. Most (88.9%) respondents' who reported hospital monitory of staff compliance to IPC had good compliance toward hand hygiene, followed sometimes available (54.8%) then not always available (39.6%). However, hand washing items and hand sanitizers availability were not significantly related with hand hygiene compliance (Table 6).

Relationship between facemask use compliance and respondents demographic characteristics

Occupation of the respondents' was significantly related to compliance with facemask use X^2(3, 156) = 23.744, p = 0.000. Facemask use compliance was proportionally higher (85.0%) among nurses, followed by CRA (58.3%), then doctors (50.0%) and finally orderlies (40.0%). Also, educational level of the respondents' was significantly associated with their compliance with facemask use X^2(1, 156) = 7.560, p = 0.006. Compliance to facemask use was high (76.8%) among those with higher education (tertiary) and as compare to 42.9% for those with lower education (senior high and below). Finally, age group was significantly associated with facemask use, X^2(2, 156) = 7.425, p = 0.024. Facemask use compliance was high (85.4%) among those within the age group 20 -29 years as compare to 52.9% for those within the age group of 40 – 59 years. However the remaining demographic characteristic had significant relation with facemask use (p > 0.05) (Table 7).

Relationship between facemask use compliance and IPC materials or services availability

Hospital monitoring of staff adherence to IPC was the only IPC material or service related to facemask use compliance among the respondents, X^2 (2, 156) = 12.556, p = 0.002. Hundred percent of those reported always availability of hospital monitoring of staff adherence to IPC had good compliance with facemask use. In-service training/workshop related to infection prevention and control and Personal protective equipment (facemask) were not significantly related to facemask use compliance (p > 0.05) (Table 8).

Table 6: Chi-square analysis of hand hygiene compliance and IPC materials or services availability.

	Availability	Hand hygiene compliance level		Total	X^2	df	p-value
		Poor	Good				
Hand washing items e.g. water, soap	Not always	3	2	5	0.185	2	0.912
	Sometimes	28	28	56			
	Always	48	47	95			
Total		79	77	156			
Hand sanitizers	Not always	53	46	99	0.943	2	0.624
	Sometimes	17	21	38			
	Always	9	10	19			
Total		79	77	156			
In-service training/workshop related to infection prevention and control	Not always	52 60.5%	34 39.5%	86	8.660	2	0.013
	Sometimes	26 40.6%	38 59.4%	64			
	Always	1 16.7%	5 83.3%	6			
Total		79	77	156			
Hospital monitoring of staff adherence to IPC	Not always	58 60.4%	38 39.6%	96	15.413	2	0.000
	Sometimes	19 45.2%	23 54.8%	42			
	Always	2 11.1%	16 88.9%	18			
Total		79	77	156			

Table 7: Chi-square analysis of facemask use compliance and respondents demographic characteristics.

		Face mask use score level		Total	X^2	Df	p-value
		Poor	Good				
Sex	Male	27	75	102	0.005	1	0.941
	Female	14	40	54			
Total		41	115	156			
Marital Status	Married	27	82	109	0.427	1	0.514
	Single	14	33	47			
Total		41	115	156			
Occupational category	Doctor	11 50.0%	11 50.0%	22	23.744	3	0.000
	Nurse	16 15.0%	91 85.0%	107			
	CRA	5 41.7%	7 58.3%	12			
	Orderly	9 60.0%	6 40.0%	15			
Total		41	115	156			
Educational level	Lower	8 57.1%	6 42.9%	14	7.560	1	0.006
	Higher	33 23.2%	109 76.8%	142			
Total		41	115	156			
Age group	20-29	7 14.6%	41 85.4%	48	7.425	2	0.024
	30-39	26 28.6%	65 71.4%	91			
	40-59	8 47.1%	9 52.9%	17			
Total		41	115	156			
Years of occupational experience	Less than 10 years	27	88	115	1.775	1	0.183
	10 years and above	14	27	41			
Total		41	115	156			
Years of departmental experience	Less than 10 years	39	109	148	0.070	1	0.933
	10 years and above	2	6	8			
Total		41	115	156			

Table 8: Chi-square analysis of facemask use compliance and IPC materials or services availability.

	Availability	Face mask use score level		Total	X^2	df	p-value
		Poor	Good				
In-service training/workshop related to infection prevention and control	Not always	24	62	86	0.458	2	0.795
	Sometimes	16	48	64			
	Always	1	5	6			
Total		41	115	156			
Hospital monitoring of staff adherence to IPC	Not always	34 35.4%	62 64.6%	96	12.556	2	0.002
	Sometimes	7 16.7%	35 83.3%	42			
	Always	0 0.0%	18 100.0%	18			
Total		41	115	156			
Personal protective equipment (facemask)	Not always	17	54	71	0.885	2	0.642
	Sometimes	15	33	48			
	Always	9	28	37			
Total		41	115	156			

Discussion

The study found the respondents to be young with a mean age of 32.78 ± 6.17 years; many (65.4%) being males. Again, the majority (69.9%) were married. This differs from two previous studies conducted in southern Ghana where most of the participants were females [11, 12]. For instance, a study by Hayeh, at the La General Hospital in Accra found 71.4% of their study population to be females [12]. Majority of the respondents' had tertiary education (91.0%) and this is in line with Kondor, study where the majority (64.0%) of the respondents' also had tertiary education [11]. The study found that many of the participants were registered general nurses (68.6%), followed by practicing medical officers (14.1%), then Orderlies and certified registered an aesthetics. Nurses were the highest respondents because nurses had the highest representation among the healthcare providers in the surgical department (from the report of 2017 TTH annual performance review). The mean years of occupational work experience of respondents was 6.49 ± 5.32 years. Again, the mean duration of respondents' years of experience particularly in the surgical ward was 3.12 ± 3.00 years. However, the great majority (94.9%) had stayed for 9-years or less in the unit. This is in line with other previous publications [11, 12].

According to WHO, 2004 practical guidelines on infection control in healthcare facilities, the role of providing IPC materials in a healthcare facility is on the administrators of the healthcare facilities [13]. The problem of healthcare worker exposure to blood-borne pathogens like HIV and hepatitis B while caring for patients is on increase in both developed and developing countries due to inadequate IPC resources [14]. In this current study at the TTH, majority (60.9%) of the respondents' hand washing items such as water and soap were always available. This is very good since hand hygiene compliance will be positive relatively to the availability of IPC materials. This is high as compared to a similar study in La General Hospital, which indicated (31.4%) availability of IPC materials (soap, water, and towel) for healthcare care workers to comply with IPC [11].

Hand hygiene after patient contacts was reported hundred percent for all respondents. This is not different to study result of Alice et al., where 3.9% of the respondents' reported never hand hygiene after patient contact and this practice is in line with recommendation from WHO and CDC[15, 16, 2]. Most (96.2%) of the respondents reported after contact with contaminated equipment or surfaces and this is in line with a study by Abdulraheem et al., which revealed 3% did not wash their hands after taking care of patients [17]. Meanwhile only 67.3% of the respondents reported hand hygiene before patient contact, this is not good compare to hundred percent hand hygiene after patient contact and opposite to Abdulraheem et al., which reported 97% of the respondents' did wash their hands before or after taking care of patients [17]. Hand hygiene on arrival at work was poorly practice as reported by less than half of the respondents (41.7%), this is out of line with WHO recommendation on hygiene and contrast to Alice et al., study which reported non-practice of hand hygiene among 30.0% of the respondents [16, 15]. Hand hygiene before glove use was poorly practice by 41.7% of the respondents, this is low as compare to Alice et al., study which reported 57.5% practice and this is against WHO recommendation on hand hygiene [16]. Meanwhile hand hygiene practice after wearing gloves was well practice by 92.3% of the respondents and this higher than 85.5% for Alice et al., study [15].

On overall hand hygiene compliance, less than half of the total respondents had good compliance 77 (49.4%) against 79 (50.6%) who had poor compliance. This is low compared to Randle et al., observational study of hand hygiene adherence following the introduction of an education intervention [18]. Randle et al found that educational program on hand hygiene is a good predictor of hand hygiene practice among healthcare workers. There was increase adherence to hand hygiene practice from the baseline of 53.0% post educational intervention to 67.7% for point 2 observation and 70.8% for point 3 observation [18]. Also low as compare to 87.5% performance from Sharif et al, study [19].

Among the demographic characteristics occupation of the respondents' was significantly associated with hand hygiene compliance, p = 0.000. Proportionally nurses had highest (59.8%) percentage of them had good compliance to hand hygiene and those with least percentage were orderlies. This is a little different as compare to a study by Musu, et al., they found that compliance rates with HH procedures and standard precautions was significantly different among HCWs, p < 0.001. Nurse aides had the higher compliance rates compared to nurses and doctors [20]. Educational level of the respondents was also associate with hand hygiene practice (P = 0.000), but this was different in Abdella, et al., study as there was no significant association (p > 0.05) [21]. Availability of IPC services related to hand hygiene were in-service training or workshops related to IPC and hospital monitoring of staff adherence to IPC, higher (83.3%) percentage of those with IPC materials or services available to them had good compliance to hand hygiene, followed by sometime available (59.4%) and lastly (39.5%) not always available.. This in line with Engdaw et al., study where training on hand hygiene had positive influence on hand hygiene compliance (AOR = 8.07, 95%CI: 2.91, 22.39) [22].

Majority (94.9%) of the respondents reported facemask use during procedures likely to generate splashes and this higher than studies by Alice et al., and Fayaz et al... In Alice et al., study 11.1% of the respondents 'and Fayaz et al., study 12.3% of respondents never use facemask for procedures likely to generate splashes [15, 23]. Use of facemask when working within 1-2metres of patients with expectoration was reported practiced by 84.6% of the respondents in this study and this is high as compare to 20.3% for never use in Alice et al., study [15]. In this facemask was never reused according to 91.0% of the respondents and this better as to 81.6% never reuse in Alice et al study [15].

Overall facemask use compliance was 115 (73.7%) for good compliance and 41 (26.3%) for poor compliance [24]. This is high as compare a study by Abdulraheem et al., which revealed 55.5% facemask use compliance among the respondents' [17].

Occupation of the respondents' was significantly related to compliance with facemask use, p = 0.000. Facemask use compliance was proportionally higher (85.0%) among nurses,

followed by CRA (58.3%), then doctors (50.0%) and finally orderlies (40.0%), this same in a similar study byYang, et al., where nurses where were almost three times likely to comply with facemask use as compare to doctors (2.61 (1.68 - 4.06) < 0.001 [25]. In this study age was another significantly associated factor, facemask use compliance was high (85.4%) among those within the age group 20 -29 years as compare to 52.9% for those within the age group of 40 – 59 years and this is similar to study by Yang, et al., [25]. Educational level was also associated with facemask use and higher education was a positive factor. This study finding is in line with Kuo et al., study which revealed that higher education was almost seven times positively associated with mask-wearing behavior (adjusted OR 6.86) [26]. Hospital monitoring of staff adherence to IPC was the only IPC service availability that was related to facemask compliance and those who reported monitoring were like to comply and this cough be positive factor because monitoring encourage usage and identify challenges with supply.

Conclusion

More than half of the healthcare providers reported poor compliance towards hand hygiene practice and above seventy percent of the reported good compliance towards facemask use. Demographic factors associated with hand hygiene compliance were: occupation and educational level of the respondents. Availability of IPC services related to hand hygiene were in-service training or workshops related to IPC and hospital monitoring of staff adherence to IPC. Demographic factors related to facemask use were: occupational category, educational level and age group of healthcare worker. Hospital monitoring of staff adherence to IPC was the only IPC service availability that was related to facemask compliance.

Recommendation

An observational research at this era Covid-19 will be help reveal compliance of hand hygiene and facemask use in the face of threat disease.

Data Availability

All data related to findings of this study are available from the corresponding author upon request.

Conflicts of Interest

Submitting authors are responsible for coauthors without not competing interests.

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