Study on the compliance of healthcare workers with the safety precautions in hospitals and health care facilities in the Kingdom of Saudi Arabia

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Abstract

Background: Prevention of Health Care Associated Infection (HCAI) is the responsibility of all individuals and services providing health care. Compliance with standard precautions reduces the risk of exposure to blood and body fluids. Many factors are responsible for non-adherence to the basic principles of universal precautions among health care providers.

Aim of the study: Assessment of the knowledge and compliance of healthcare workers with safety precautions in health care facilities in Saudi Arabia.

Method: An observational cross-sectional study was performed on 400 healthcare workers in health care facilities in Saudi Arabia. The study was conducted between March and April 2019. The tool used in this study was a self-administered questionnaire divided into three sections: (1) socio demographic, (2) knowledge about concept of standard precautions, its measures and when used, (3) Practice of standard precautions.

Results: The study sample included 400 health workers (medical students (n=73), doctors (n=272), dentists (n=35) and pharmacists (n=20)), 125 male and 275 female. They were taken from hospitals in two district areas; the age range was 20-40 years and life time work experience between 13 months and 10 years. About (46.5%) of the respondents had been between 5 and 10 years of working experience. Most of the participants (79.75%) had previously heard about infection control standard precautions in healthcare and more than half of them had known its concept. Regarding the practice of hand hygiene, most of them always practiced hand hygiene.

Conclusion: More than half of our participants had sufficient knowledge and practice regarding standard precautions.

Key words: Compliance, Healthcare workers, Safety precautions.

Introduction

Standard precautions are a set of measures formulated to prevent transmission of blood borne pathogens when providing health care. Since identification of patients infected with these pathogens cannot be reliably made by medical history and physical examination, the Centers for Disease Control (CDC) has recommended that standard precautions are used on all patients, regardless of knowledge about their infection status [1].

Health care workers (HCWs) are at risk of various occupational hazards in the hospital, including exposure to blood borne infections such as HIV and hepatitis B and C virus from sharps injuries and contact with body fluids [2].

Developing countries, which account for the highest prevalence of HIV-infected patients in the world, also record the highest rate of needle-stick injuries [3].

The World Health Organization (WHO) estimates that about 2.5% of HIV cases and 40% of HBV and HCV cases among HCWs worldwide are the result of these exposures [4].

The risk of seroconversion following a needle-stick injury from an HCV-antigen positive patient is estimated to range from 1.2% to 10% [2].

The level of practice of standard precautions by health care workers differs from one health care worker to another. Their differences in knowledge, attitude and practices may be influenced by the type of their training. Various studies carried out among different categories of health care workers have found that exposure to blood or other body fluids were approximately 9.3%. A similar study conducted in Ibadan found a higher exposure rate of 25.1 %. Since there are very few studies done on these lines, we made an effort to test knowledge, attitude and practice by doing pre and post-test evaluation among various categories of health care personnel [5].

Compliance with standard precautions reduces the risk of exposure to blood and body fluids [6].

Compliance on the part of healthcare workers with standard precautions has been recognized as an efficient means to prevent and control health care-associated infections in patients and health workers [7].

Standard precautions include hand washing; use of barriers (gloves, gown, cap and mask); care with devices, equipment and clothing used during care; environmental control (surface processing protocols and health service waste handling); adequate discarding of sharp instruments; and patient's accommodation in accordance to requirement levels such as an infection transmission source [2].

Hand hygiene is one of the most important elements of infection control activities. If properly implemented, hand hygiene alone can significantly reduce the risk of cross-transmission of infection in healthcare facilities [8].

Prevention of Health Care Associated Infection (HCAI) is the responsibility of all individuals and services providing health care [6].

Adoption of safe practices for handling needle sticks and other sharp objects, in view of the possibility of outbreaks, especially of Hepatitis B and C is also a preventive measure worthy of mentioning [2].

Many factors are responsible for non-adherence to the basic principles of universal precautions among health care providers [9].

From the available literature, the compliance with universal precautions among health workers in the Saudi Arabia has not been assessed.

Therefore, this study was conducted to assess the knowledge and compliance of healthcare workers with safety precautions in health care facilities in Saudi Arabia.

Aim of the study: Assessment of the knowledge and compliance of healthcare workers with safety precautions in health care facilities in Saudi Arabia.

Objectives: To evaluate knowledge of standard precautions among healthcare workers in hospitals in Saudi Arabia.

Patients and methods

This was an observational cross-sectional study, aimed to study knowledge and compliance of safety precautions among healthcare workers in health care facilities in Saudi Arabia.The study was conducted over a two month period between March and April 2019.

This study was undertaken in a governmental hospital, and private hospital and primary healthcare units in east and west Saudi Arabia. Both hospitals provide tertiary level of patient care covering major medical and surgical disciplines. The study population of 400 health workers included medical students (who had clinical training) (n=73), doctors (n=272), dentists (n=35) and pharmacists (n=20) of both hospitals, excluding those on annual or study leave at the time of the study.

Sample size was estimated using EPI INFO (Epidemiological Information Package) version (21) 3.5.3.statistical packages assuming that the frequency was (20%) at a confidence interval of 95 % and power of 80%. The Sample was conventional sample; selection of sample was done when sample size had been completed, and the application form closed.

Data collection:
Data was collected from study participants using a standardized self-administered questionnaire, applied in a Google form which had been loaded onto the internet after explaining the purpose of the study to those who could

be reached and obtaining consent for the questionnaire to be filled out anonymously. The responses of study participants were treated confidentially. The questionnaire was pre-tested on a random sample of 22 doctors, 8 medical students, 5 dentists and 5 pharmacists to ensure practicability and validity in questions and interpretation of responses. Following pre-testing, some questions and responses had to be revised for clarity or deleted as appropriate.

The self-administered questionnaire was divided into three sections
(1) Socio-demographic characteristics; Age, gender, occupational status, area of residency, work experience and place of training, expressed in six questions.
(2) Knowledge about concept of standard precautions, its measures and when used,. This was represented in ten questions.
(3) Practice of standard precautions especially hand washing, use of personal protective equipment such as gloves, face masks, oral care procedures and injection safety, included five questions.

Questions were developed from review of qualitative and quantitative literature for relevant items, [10,11] including guidelines on standard precautions provided by the World Health Organization (WHO, 2007), which included 21 items.

Scoring of the questionnaire:
Knowledge was measured by a set of 10 questions. Seven questions were given one point for answer yes and zero for answer no or I don't know. On the other hand, three questions were given one point for correct answer and 0 was given for an incorrect answer. Consequently, knowledge scores ranged from 0 to 18.

Practice was measured by a set of 5 questions using a three-point Likert's scale response for practice questions (i.e. Always, Not always, and rarely) where positive responses were expected, scores of 3, 2 and 1. Consequently, practice scores ranged from 5 to 15.

The knowledge score for each participant was expressed as a percentage from the total score. Sufficient knowledge was considered when the percentage of participant's knowledge score > 50%; while less than 50% was considered as insufficient knowledge. In addition, the practice score for each participant was expressed as a percentage from the total score. Sufficient practice was considered when the percentage of participant's practice score > 50%; while less than 50% was considered as insufficient practice.[12]

Data management:
The Collected data were recorded then presented and analyzed using SPSS (Statistical Package for the Social Sciences) version 22.0 and Epi info for windows version 3.5.3.

Data were represented in tables and graphs as frequencies and percentages.

Ethical considerations:
Ethical approval for the study was obtained from studied hospitals, ethical review committee and all study participants fulfilled consent for the study.

Constraints:
There were some constraints as we needed to increase the sample taken to avoid the not fully filled out questionnaires.

Results

The study sample included 400 health workers (medical students (n=73), doctors (n=272), dentists (n=35) and pharmacists (n=20)), 125 male and 275 females. They were taken from hospitals in two district areas; the age range of respondents was 20-40 years and life time work experience varied between 13 months and 10 years. About (46.5%) of the respondents had been between 5 and 10 years of working experience as shown in Table 1 & Figures1 & 2.

It was good to observe that most of the participants (79.75%) had previously heard about infection control standard precautions in healthcare and more than half of them had known its concept and said that it should be used in all situations not only in case of infections (Tables 2 &3).

Regarding level of awareness, it was good to find that most of the physicians and medical students had previous knowledge about standard precautions and more than 60% knew its concept. Other measurements of knowledge among physicians and medical students have been illustrated in Figure 3.

Regarding the practice of hand hygiene, 77.5%, 85.3%, 83% and 59.8% always practiced hand hygiene after touching patients, wearing protective masks, had personal protective equipment and bending the needles after usage, respectively (Table 4).

The knowledge score as well as the practice score for each participant was expressed as a percentage from the total score. More than half of our participants had sufficient knowledge and sufficient practice regarding standard precautions of infection control.

Table 1: Demographic characteristics among students in the study

Demographic Character		No	%
Gender	Male	125	31.3
	Female	275	68.8
	Total	**400**	**100.0**
Age	20-30	227	69.3
	30-40	123	30.8
	40-50	0	0
	>50	0	0
	Total	**400**	**100.0**
Occupational Status	Medical Student	73	18.3
	Doctors	272	68
	Dentist	35	8.8
	Pharmacist	20	5
	Total	**400**	**100.0**
Work experience	<5Y	141	35.25
	>5Y	186	46.5
	Still students	73	18.25
	Total	**400**	**100.0**
Place of training	Governmental hospital	91	22.8
	Private hospital	112	28
	Primary healthcare	197	49.3
	Total	**400**	**100.0**
Area of Residency	East	98	24.5
	West	302	75.5
	Total	**400**	**100.0**

Figure 1: Occupational Status among participants in the study

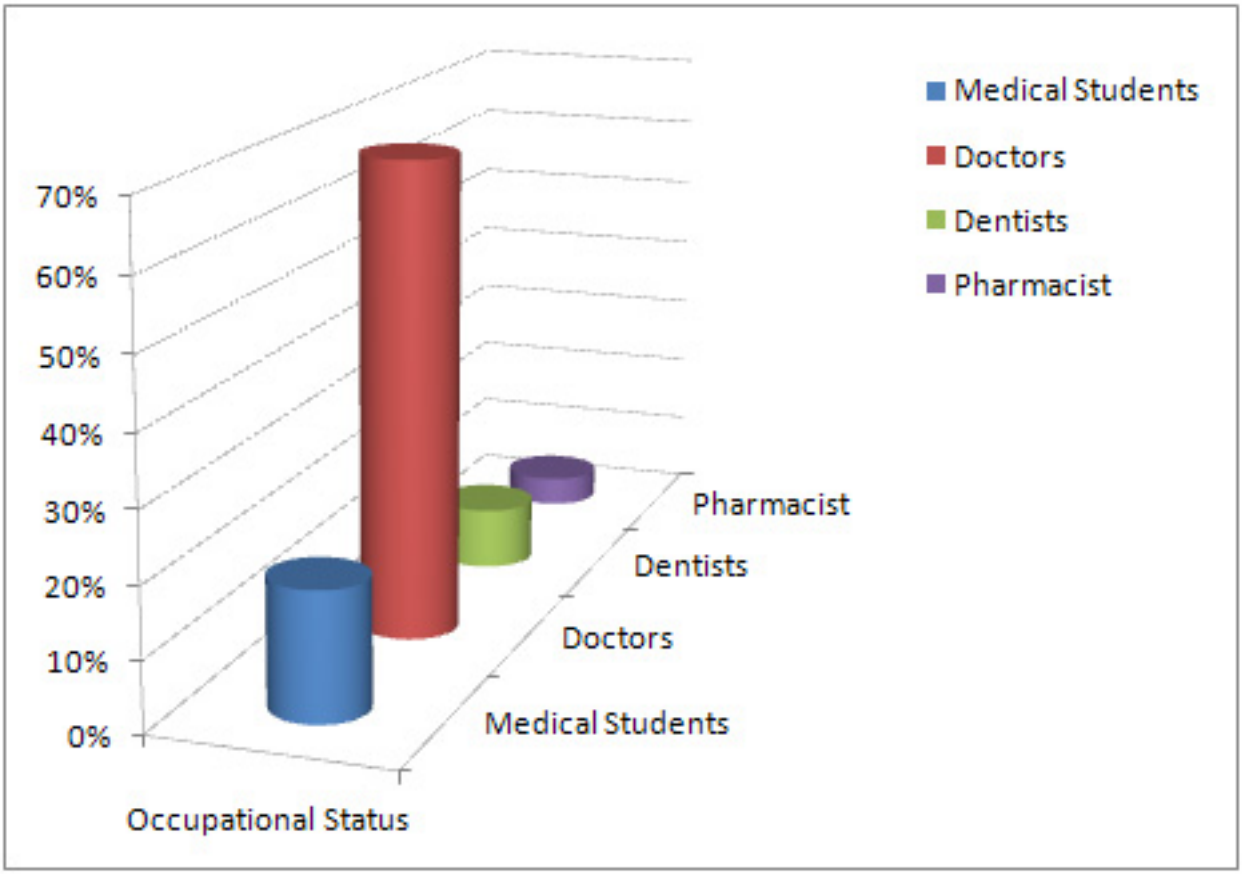

Figure 2: Place of training among participants in the study

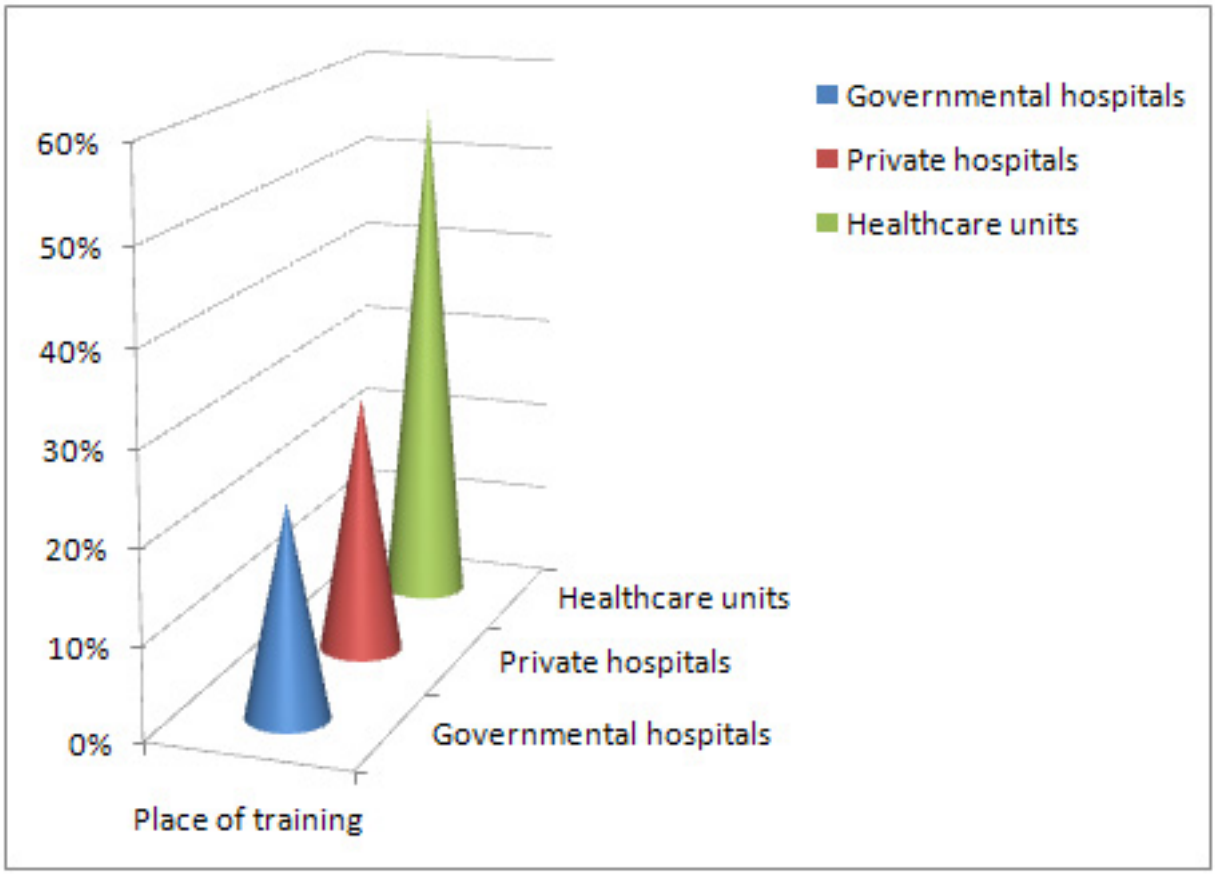

Figure 3: Physicians and medical students' knowledge about standard precautions

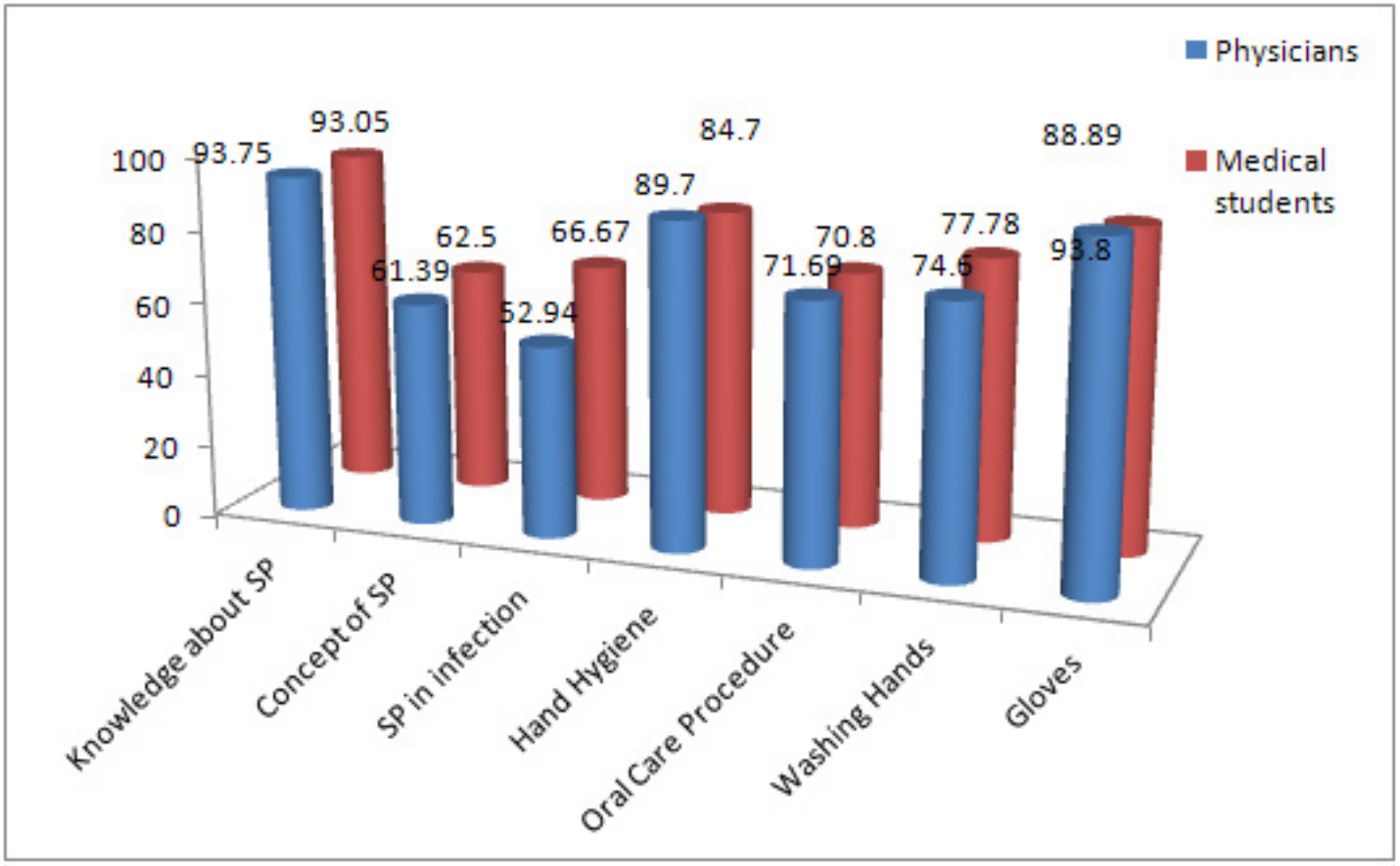

Table 2: Participants' knowledge about standard precautions

		No	%
Knowledge of Standard Precautions	Yes	319	79.75
	No	81	20.25
	Total	**400**	**100.0**
Knowledge of Concept SP	Yes	247	61.75
	No	153	38.25
	Total	**400**	**100.0**
SP not only used in infection	Yes	206	51.5
	No	124	31
	I don't know	70	17.5
	Total	**400**	**100.0**
Hand Hygiene for different patients	Yes	351	87.8
	No	24	6
	Not always	25	6.3
	Total	**400**	**100.0**
Using gloves during oral procedures	Yes	271	67.8
	No	89	22.3
	I don't know	39	9.8
	Total	**400**	**100.0**
Washing hands after removal of gloves	Yes	293	73.3
	No	80	20
	I don't know	26	6.5
	Total	**400**	**100.0**
Gloves should be changed	Yes	366	91.5
	No	15	3.8
	I don't know	19	4.8
	Total	**400**	**100.0**

Table 3: Participants' knowledge about hand hygiene and mode of transmission

		No	%
Hand Hygiene before and after treatment to protect	Health care workers	30	7.5
	Patients	28	7
	Environment	7	1.8
	All of the above	**335**	**83.3**
Most important mode of transmission	Hospital	23	5.8
	Air	20	5
	Hands	71	17.8
	Food	13	3.3
	All of the above	**273**	**68.3**
1st choice to reduce transmission of infection	Mask	20	5
	Gloves	21	5.3
	Hand hygiene	90	22.5
	Gowns	3	0.8
	All of the above	**266**	**66.5**

Table 4: Participants' practice towards standard precautions

		No	%
Using alcohol for decontamination	Always	310	77.5
	Not always	65	16.3
	Rarely	24	6
	Total	**399**	**100.0**
Wearing protective masks	Always	341	85.3
	Not always	38	9.5
	Rarely	21	5.3
	Total	**400**	**100.0**
Sharing protective masks (should not be used)	Always	332	83
	Not always	28	7
	Rarely	40	10
	Total	**400**	**100.0**
Hand Hygiene for different patients	Always	239	59.8
	Not always	107	26.8
	Rarely	53	13.3
	Total	**399**	**100.0**
Care with infectious disease	Always	352	88
	Not always	15	3.8
	Rarely	33	8.3
	Total	**400**	**100.0**

Discussion

Knowledge and practice of standard precautions are very important in preventing HCAI and also in the protection of health care personnel from risk of acquiring infections especially from blood borne pathogens like HIV, HBV and HCV [5].

Knowledge and training in standard precautions, high risk perception and longer duration of professional experience have been shown to be associated with improved compliance with standard precautions among health workers [13].

Therefore, this study was conducted to assess the knowledge and compliance of healthcare workers with safety precautions in health care facilities in Saudi Arabia.

The study sample included 400 health workers (medical students (n=73), doctors (n=272), dentists (n=35) and pharmacists (n=20)), 125 male and 275 female. They were taken from hospitals in two district areas; the age range of respondents was 20-40 years and life time work experience varied between 13 months and 10 years. About (46.5%) of the respondents had been between 5 and 10 years of working experience as shown in Table 1& Figures 1&2).

It was good to observe that most of the participants (79.75%) had previously heard about infection control standard precautions in healthcare and more than half of them had known its concept and said that it should be used in all situations not only in case of infections (Tables 2 & 3).

Regarding level of awareness, it was good to find that most of the physicians and medical students, had previous knowledge about standard precautions and more than 60% knew of its concept. Other measurements of knowledge among physicians and medical students have been illustrated in Figure 3.

The above mentioned results were in agreement with the study conducted by Ogoina et al., who found that the majority (91.6%) of the study participants had previously heard about standard precautions of infection control. Ninety seven per cent knew that standard precautions should be practised on all patients and laboratory specimens irrespective of diagnosis. But, in disagreement with them in finding that about 50% of their participants were ignorant of the WHO's recommendation that sharps/needles should never be recapped, bent or broken [10].

We are in agreement with the findings mentioned by Jha et al., among 81 study participants, 60 (74.1%) who were aware of infection control committees [6].

Regarding the practice of hand hygiene, 77.5%, 85.3%, 83% and 59.8% always practiced hand hygiene after touching patients, wearing protective masks, had personal protective equipment and bending the needles after usage, respectively (Table 4).

Similarly, the results reported by Jha et al., who mentioned that with regard to the practice of hand hygiene, 53 workers (89.8%) always practiced hand hygiene after coming in contact with blood or other body fluids of patients, 42 (68.9%) before touching patients and 58 (95.1%) after touching the patients. Out of 64 staff who actually handled patients, 59 wore gloves while cleaning waste material. Among 59 staff who were liable to come in contact, 57 (96.6%) used protective barriers like masks, gloves, aprons and goggles while serving HIV/TB patients [6].

On the other hand there was some differences in the study performed by Ogoina et al., who found that the practice of hand hygiene, 58.5%, 28.1% and 63.6% always practiced hand hygiene after touching patients, after touching patients' surroundings and after removing gloves, respectively. Eighty two per cent always wear gloves before venepuncture [10].

The knowledge score as well as the practice score for each participant was expressed as a percentage from the total score. More than half of our participants had sufficient knowledge and sufficient practice regarding standard precautions of infection control.

This was consistent with the study carried out by Ogoina et al., in which the overall knowledge scores were generally high. However, in contrast with the same study in finding poor practice of the various elements of standard precautions of infection control, especially among less experienced health workers [10].

In other studies from Nigeria, less than 40% of health workers from Enugu,[14] Abuja[15] and Asaba[16] had poor knowledge of the basic elements of standard precautions

Also, we were in disagreement with studies from other parts of Nigeria [16,17] as well as studies from other parts of the world[10] in which poor practice of the various elements of standard precautions of infection control was reported.

The wide variation in knowledge and practice score regarding the various elements of standard precautions of infection control among health workers worldwide can be explained by variation in demographic characteristics and difference in training and qualification of HCW.

Conclusion

More than half of our participants had sufficient knowledge and sufficient practice regarding standard precautions of infection control.

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