

Knowledge about the Standard Precautions among Health Care Workers in Primary Health Care Centers, Ministry of Health, Jeddah 2017

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ABSTRACT

Introduction: Health care worker at risk of health associated infection (HAIs) due to their exposure to the patients during carrying out their duties. Health care workers in primary health care centers are the first to detect and to prevent the spread of infection. Standard precautions are regarded as an effective means for protecting health care worker, patients and community. This study aimed to assess the knowledge about the standard precautions and to identify factors associated among health care worker in primary health centers, ministry of health, Jeddah 2017.

Method: A descriptive cross-sectional study was conducted among healthcare workers in PHCs in Jeddah during month of December 2017. The sample included general practitioner, family physicians, Dentist, nurses, pharmacist. Data were collected by using self-administered questionnaire which included information about demographic characteristics, health care workers' knowledge about stander precaution. Data entry, tabulation and analysis were done using IBM SPSS statistical software package version 21.

Results: The majority of the participants had good knowledge level. The highest knowledge levels were for the following domains: hand hygiene, respiratory Hygiene/Cough Etiquette, and injection safety. Participants' knowledge grades regarding standard precaution were significantly higher among nurses, those with diploma degree, and those with lower monthly

income ($p=0.02$, $p=0.015$, and $p=0.003$). The main information resources were educational courses.

Conclusion: The knowledge level for HCWs in PHCs regarding SP was high, with some barriers against complete commitment that can be avoided with regular courses to HCWs and field visit to PHCs.

Keywords: Knowledge, Precautions, Protective Equipment.

Abbreviations:

SP: Standard Precaution; **PHCCs:** Primary Health Care Centers; **MOH:** Ministry of Health; **HCWs:** Health Care Workers; **PPE:** Personal Protective Equipment; **WHO:** World Health Organization; **CDC:** Centers for Disease Control and prevention; **SA:** Saudi Arabia; **CME:** Continuous Medical Education.

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INTRODUCTION

The Centers for Disease Control and Prevention (CDC) defines standard precautions as a group of infection prevention practices that apply to all patients, regardless of suspected or confirmed infection status, in any setting in which healthcare is delivered. It is based on the presumption that every person is infected or colonized with an organism that could be transmitted in the healthcare setting and thus health care workers need to apply infection control practices during the delivery of health care.

Health care worker at risk of health associated infection (HAIs) due to their exposure to the patients during carrying out their duties. Health care workers in primary health care centers are the first to detect and to prevent the spread of infection. Standard precautions are regarded as an effective means for protecting health care worker, patients and community. They are designed to protects HCWs from infection by applying the basic principles of

infection prevention through hand hygiene, personal protective equipment (PPE), needle stick and sharps injury prevention, cleaning and disinfection, respiratory hygiene (cough etiquette), waste disposal and safe injection practices.¹ SPs originated at 1987 instead of universal precaution by CDC, at 2007-2009 WHO has required that SPs guideline included in education and health promotion strategies by all hospital worldwide. WHO estimated globally at least 50% of 12 billion injection administered each year in developing countries are unsafe, this demonstrate serious health risk. Non-adherent to SPs by HCWs has been assumed to be determined by range of factors including lack of knowledge interference with flow of work and perception of probable risk. Several studies reported lack of appropriate knowledge of SPs and infection control was the main predictor for poor compliance, but studies at PHC level are very few.

A meta-analysis conducted in six global regions including America, European, Eastern Mediterranean, African, southeast Asian and western pacific at (2009-2014) to assess factors affecting compliance to SPs on all area of hospital settings worldwide, this factor affected by health threats, behavior modification, system control and education, health promotion.² The results of HCWs compliance with practice of SPs was 89.6%. In 2012 a cross-sectional study about knowledge and practice of SPs in public health facilities in Abuja, Nigeria. Main reasons affecting adherent to SPs are lack of resources.³

In 2012 a cross-sectional study about injection safety among PHCCs workers was done in Jizan region, KSA. The result was found that the methods of safe disposal of needles and sharps were 84%. Continuous Medical Education (CME) programs on infection control were present in 60% of PHCCs. The rate of needle stick injury in the past year was 14%. So PHCCs need better educational program on safety injection especially at rural PHCCs.⁴

In 2009 survey was done about health care providers' knowledge of SPs at PHCCs level in SA. 1004 HCWs included, concluded that the level of awareness of SPs among providers at PHC centers in Al-Hassa was low, with several misconceptions and a perception of low risk. The need for on-the-job practical training in SPs and infection control guidelines was 53.7% of participants. A lack of resources at PHC centers to implement SPs was 43.9%, lack of training by 33.2% and work overload. These were the main factors affecting HCWs compliance to word SPs during routine care.⁵

RATIONALE

- The researcher is interested to know about infection control and prevention measures.
- There is a great risk to transmit infection from primary health care workers to the community and the burden of treatment in comparison to prevention.
- The importance of accreditation for PHC in improving adherent to SPs among health care workers.
- SPs malpractice represents public health problem with wide variety of prevalence locally and internationally.

AIMS

This study aims to increase level of awareness and adherence toward SPs among health care workers and to determine the knowledge barriers affecting the adherent to SPs.

OBJECTIVES

- To assess knowledge about the standard precautions among health care worker among primary health centers, ministry of health, Jeddah 2017.
- To identify factors associated with adherence toward standard precautions among health care worker in ministry of health primary health centers, Jeddah 2017.

LITERATURE REVIEW

In 2011, in Nepal, Timilshina and his colleagues conducted a cross-sectional study among 100 primary health workers to determine the infection control knowledge and practice compliance of basic health workers. The results revealed that only 22% had correct knowledge of universal precautions and 73%

said they follow universal precaution guidelines. A total of 62% stated that they regularly used protective gloves while handling patients and 72% stated that they never used high-level disinfection to eliminate all microorganisms from instruments and other items that would come into contact with broken skin or intact mucous membranes. The main barriers for noncompliance were the irregular supply of materials (31%); lack of an autoclave and other high-level disinfection equipment (50%); lack of knowledge and insufficient technical skills regarding universal precaution procedures (20%).⁶

In 2014, in Afghanistan, Fayez and his colleagues conducted a cross-sectional study to detect if there is an association between knowledge and practice. They recruited 300 HCWs from four national public hospitals in Kabul, Afghanistan. And use a self-administered questionnaire. The results revealed that the mean knowledge score was 5.2 (SD=1.5). While the mean practice score was 8.7 (SD = 2.2). A total of 90.6% and 70.8% of HCWs believed that UPs were necessary in contact with urine/feces and tears, respectively, even that UPs are not necessary in these cases. On the other hand, 57.8% stated that they always recapped the needle after giving an injection, and 31.8% always change gloves in between patients. There were no associations between the knowledge and self-reported practice of UPs.⁷

In 2011, in Ethiopia, Gebresilassie and his colleagues conducted an institution based cross-sectional study among 483 health care workers to assess standard precautions practice among them and the factors affecting their practice in Mekelle special zone, Northern Ethiopia. The result revealed that 207 (42.9%) of them had a good practice of standard precautions. Younger healthcare workers had the better practice. The availability of written guideline and training given for the healthcare workers were predictors of standard precautions practice. They concluded that there is a suboptimal and inconsistent practice of standard precautions in the healthcare setting which put patients and health care workers at significant risk of acquiring infections.⁸

In 2017, in Nigeria, Otovwe and Adidatimi conducted a cross-sectional study among 200 health workers at Federal Medical Centre Yenagoa, Bayelsa State, to identify the level of knowledge, attitude and practice of standard precautions. They used a semi-structured questionnaire that assessed the knowledge, attitude, and practice of standard precautions. The result showed that majority of the respondents had good knowledge 79.0%, attitude 70.0% and practice 91.50% of standard precautions respectively. Less than half of the respondents 87 (43.5%) reported always recapping needles after use, 52 (26.0%) always detach needles from syringes and 105 (52.5%) had experienced needle stick injuries in the last one year.⁹

In 2009, in ALHasaa, Saudi Arabia Amin and Al Wehedy conducted a cross-sectional study among healthcare workers (HCWs) to detect the level of knowledge of standard precautions (SPs) and infection control, and to determine possible correlates that influence such knowledge. They used a self-administered questionnaire. The data covered basic knowledge of components of SPs and infection control including "objectives, hand hygiene, personal protective equipment, sharps disposal, environmental sanitation and care of healthcare providers". The results demonstrated the knowledge deficits of components of SPs, especially those related to hand hygiene, sharps disposal, management of sharps injuries and environmental cleaning.

Fallacy conception was reported in the management of HCWs after exposure to patients with communicable diseases and following sharps injuries. Female gender, holding a postgraduate degree and >5 years of experience in primary health care were positive correlates to the knowledge score. The main factors of implementing SPs during routine tasks were lack of resources and training opportunities and excessive workload. They recommended current training and medical and nursing school curricula should, therefore, be revised.⁵

In 2017, conducted a cross sectional study among clinical students attending the King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia. To assess the level of knowledge of SPs and IC. The data collection instrument was an adopted 41-item questionnaire that measured knowledge of SPs and IC and consists of in five parts. A score of ≥ 24 (60%) indicated sufficient knowledge. The result revealed that most students (73.6%) had sufficient knowledge (men, 67.2% and women, 80.6%). The highest scores were for the domains "general concept of SPs", "hand hygiene", and "personal protective equipment", while the lowest scores were for "disposal of and injuries from sharp objects" and "health-care providers' care". The main information source was formal curricular teaching.¹⁰

MATERIALS AND METHODS

Study Design

The study was descriptive cross-sectional study design, based in Jeddah PHCCs.

Study Area

The study was conduct in PHCs that belong to the ministry of health in Jeddah city.

Jeddah city located in Makkah Almokramah province in the western area of Saudi Arabia, on the coast of Red Sea. It is the second largest city in Saudi Arabia after the capital city Riyadh. It is the most important commercial city and the main seaport of Saudi Arabia. It is the main entrance for pilgrims to Makkah city. There are 44 PHCs in Jeddah that have physicians from different specialties. Those PHCs provide major health services to large portion of the community. They are distributed to five sectors: northeast, northwest, center, southwest and southeast each sector contains from 8-10 PHCC.

Study Population

Health care workers in primary health care centers, general practitioner, family physicians (diploma and board degree), Dentist, any other specialty, nurses, pharmacist, who work in PHCCs in Jeddah at 2017.

Inclusion Criteria

General practitioners, family medicine physicians, dentist, nurses, and pharmacist included in the study. Both gender and Saudi and non- Saudi of all ages included in the study.

Exclusion Criteria

Administrative staff was excluded from this study.

Sample Size

Using <http://www.raosoft.com/samplesize.html>

Total number of health care worker in PHCCs HCWs in Jeddah 2017 is 1400, by using raosoft calculator; sample size was calculated with the following criteria:

- 95% confidence level.

- Expected proportion 50%

- Error (0-10) =5

- Sample size 302

Sampling Technique

Multistage stratified sampling technique used for the selection of PHCCs.

Stage 1: Selection of PHC: as they are 5 strata (supervisory sectors) that contain 44 PHC, from each stratum 50% of their centers randomly selected, so the total of 22 PHCs was selected in this study.

Stage 2: Selection of HCW from PHC. General practitioners, family medicine physicians, dentist, nurses, and pharmacist included in the sample.

Data Collection Tool

A self-administrated questionnaire designed in the English and Arabic language. The questionnaires reliability and validity determined using pilot study and collecting experts' opinions.

The questionnaire includes three sections:

Section 1: Socio-demographic data of HCWs including the specialty, qualification degree, age, gender, marital status, income and number of year in practice. Number of courses in infection control measures, training, reading and immunization.

Section 2: Questions to assess the level of knowledge of HCWs toward standard precautions (SPs). The elements of stander precautions are hand hygiene, personal protective equipment (PPE), needle stick and sharps injury prevention, cleaning and disinfection, respiratory hygiene (cough etiquette), waste disposal and safe injection practices.

Section 3: Institutional related accreditation, availability of infection control officer, local policy and procedures, governmental building or not all these factors studded and included in the questionnaire.

Data Collection Technique

The questionnaire submitted to the health care workers during working hours. The participants asked to answer the questionnaire on the spot and subsequently collected after completion. The purpose of the study clearly discussed with HCWs and managers of the centers. We randomly allocated PHCs to have equal chance to be involved in the study.

Study Variables

A- Dependent variable

- Knowledge of HCW about SPs.

- Knowledge of HCW about barriers affecting the adherent to SPs.

B- Independent variables

Include the specialty, qualification degree, and number of working years, number of training hours, building, accreditation and number of patients (work load).

Data Entry and Analysis

Data entered and analyzed by IBM SPSS statistical software package version 21. for qualitative variable, frequencies and percentage were used for description. Mean with standard deviation used for the descriptive of quantitative variables. Statistical significance considered at P-value<0.05 and confidence interval of (95%CI).

Pilot Study/Pretesting

Pilot study conducted in primary health care centers that belong to the ministry of health among HCWs to test the feasibility and applicability of the questionnaire. 10% of the sample size included in a pilot study and the subjects were included in the actual study. (Pilot subjects should be excluded from the actual study!!)

Ethical Considerations

- Joint program of family and community medicine and research committee approval.
- Written permission from the joint program of family and community medicine to facilitate the conduction of the research.
- PHC and relative authority's approval.
- Individual consent has been written on the front page of the questionnaire and considered as a prerequisite for data collection.
- Data kept confidential and will not be disclosed except for the study purpose.
- The results and recommendations will be conducted to the institute.

Table 1: Demographic Data of healthcare workers in primary healthcare centers, Jeddah 2017

	N	%
Gender		
Male	75	25.6
Female	218	74.4
Nationality		
Saudi	278	95.5
Non-Saudi	13	4.5
Marital state		
Married	230	78.8
Divorced	17	5.8
Widowed	6	2.1
Single	39	13.4
Salary		
<5000	2	.8
5000-10000	79	30.0
10001-20000	135	51.3
20001-30000	35	13.3
> 30000	12	4.6

Table 2: Educational level, working position and clinic of healthcare workers in primary healthcare centers, Jeddah

	N	%
Educational level		
Diploma	153	53.1
Bachelor	96	33.3
Master	13	4.5
PHD	6	2.1
Board	20	6.9
Working position at the PHC		
Consultant	10	3.8
Specialist	39	14.7
Resident	50	18.8
House officer	3	1.1
Dentist	17	6.4
Dental Assistant	11	4.1
Nurses	122	45.9
Pharmacist	14	5.3
Working clinic in PHC		
General clinic	128	44.5
Antenatal clinic	7	2.3
Well baby clinic	15	5.1
Vaccination clinic	17	5.9
Triage clinic	38	13.2
Dental clinic	21	7.3
Other	61	21.3

RESULTS

A total number of 293 healthcare workers agreed and returned the completed questionnaires, representing a response rate of 97%. Female were 74.4% (218), and male were 25.6% (75), with mean age score 36.0±7.3 and range 24-56. The majority (78.8%) of our sample were married, More than half (53.1%) had diploma certificate, 51.3% had salary between SR10001 and SR20000, 45.9% (122) were nurses, and 44.5% (128) of the participant were working in general clinic.(Table 1 and table 2).

Table 3: General knowledge on standard precautions among healthcare workers in PHCs, Jeddah 2017

	N	%
Concept of standard precautions		
Hand washing before and after contacting patient	47	15.9
Cough etiquette	1	0.3
Safe injection practices	241	82.0
Best answer	4	1.3
Potential ways of occupational exposure		
Needle stick /sharp injury	39	13.2
Splash on the eye	1	0.3
Inhalation	1	0.3
Talking to patients	2	0.7
Touching patients	6	2.0
Best answer	239	81.0

body fluids that require standard precautions		
Blood	31	11.6
Vaginal fluid	1	0.3
Blood tinged body fluids	2	0.7
Saliva	2	0.7
Best answer	252	85.6

Table 4: Knowledge on Hand hygiene practice among healthcare workers in PHCs, Jeddah 2017

	Yes		No		I don't know		Not applicable	
	N	%	N	%	N	%	N	%
- Before patient contact.	277	94.9	10	3.4	1	0.3	4	1.4
- Before performing aseptic task	261	91.9	14	4.9	6	2.1	3	1.1
- After patient contact.	276	96.5	5	1.7	3	1	2	0.7
- After contacting immediate vicinity of the patient.	268	94.4	12	4.2	4	1.4	0	0
- After contacting blood, body fluids or contaminated surfaces.	279	97.6	3	1	3	1	1	0.3
- After removing gloves	254	89.1	22	7.7	9	3.2	0	0
- When moving from a contaminated-body site to a clean body site during patient care.	263	92.6	15	5.3	6	2.1	0	0

Table 5: knowledge of using PPE with potential risk of various body fluids among healthcare workers in PHCs, Jeddah 2017

	Yes		No		I don't know		Not applicable	
	N	%	N	%	N	%	N	%
- Availability of PPE.	234	84.5	19	6.9	13	4.7	11	4
- Doffing of PPE.	223	81.4	13	4.7	27	9.9	11	4
- Hand hygiene with PPE.	243	89.6	8	3	14	5.2	6	2.2
- Using gloves with various body fluids.	260	91.9	7	2.4	10	3.5	6	2.2
- Using gloves with more than one patient.	258	91.5	9	3.2	10	3.5	5	1.8
- Washing gloves for reuse.	258	91.5	15	5.4	8	2.8	4	1.3
- Using gown with various body fluid exposure.	248	88.6	15	5.4	12	4.2	5	1.8
- Using gown with more than one patient.	237	84	27	9.6	12	4.2	6	2.2
- Using PPE with procedures that generate splashes of body fluids.	257	91.3	12	4.2	9	3.2	4	1.3

Table 6: knowledge of Injection safety among healthcare workers in PHCs, Jeddah 2017

	Yes		No		I don't know		Not applicable	
	N	%	N	%	N	%	N	%
- Using aseptic technique with needle injection.	260	93.2	7	2.5	9	3.2	3	1.1
- Using needles and syringes for one patient.	268	94.4	10	3.5	4	1.4	2	0.7
- Disinfecting medication vial with alcohol.	226	79.9	27	9.5	27	9.5	3	1.1
- Using needles and syringes for one time.	244	87.1	15	5.4	19	6.8	2	0.7
- Single-use of medication vials and ampules for one patient only.	260	91.9	7	2.5	15	5.3	3	1.1
- Using medication tubing and connectors for one patient only.	255	90.1	8	2.8	19	6.7	1	0.4
- Labeling the date in multi-dose vials when first opened.	235	84.2	8	2.9	34	12.2	2	0.7
- Using centralized medication area for multi-dose vials.	178	68.5	23	8.8	55	21.2	4	1.5
- Using sharp container for disposal of sharps.	223	80.5	21	7.6	26	9.4	7	2.5
- Using regulated medical waste rules with filled sharps containers.	266	95.3	1	0.4	10	3.6	2	0.7
- Storing controlled substances in secure area.	236	84.9	6	2.2	27	9.7	9	3.2
- Wearing a facemask during injecting material into epidural space.	238	86.2	11	4.0	17	6.2	10	3.6

Table 7: knowledge of Respiratory Hygiene/Cough Etiquette among healthcare workers in PHCs, Jeddah 2017

	Yes		No		I don't know		Not applicable	
	N	%	N	%	N	%	N	%
- Posting signs of respiratory infection at entrances.	259	91.2	6	2.1	14	4.9	5	1.8
- Providing tissues and no- touch receptacles for tissue disposal.	259	91.2	8	2.9	10	3.6	6	2.1
- Providing resources for hand hygiene near waiting area.	258	91	7	2.5	12	4.2	6	2.1

Table 8: knowledge of Environmental Cleaning among healthcare workers in PHCs, Jeddah 2017

	Yes		No		I don't know		Not applicable	
	N	%	N	%	N	%	N	%
- Availability of supplies for cleaning and disinfection.	231	83.4	8	2.9	30	10.8	9	3.3
- Availability of high-touch surfaces	209	77.1	8	3	38	14	16	5.9
- Using cleaning materials and disinfectants as manufacturer's instructions.	227	84.8	6	2.2	28	10.4	9	3.4
- HCP used PPE when engaged in environmental cleaning.	217	80.4	10	3.7	36	13.3	7	2.6

Table 9: Sources of knowledge about SP among healthcare workers in PHCs, Jeddah 2017

Sources for information about SP	N	%
None	21	7.7
Scientific journals	58	14
Mass-media	31	10
Educational courses	137	50.2
Physicians	33	12.3

Table 10: Educational need assessment among healthcare workers in PHCs, Jeddah 2017

	Yes		No	
	N	%	N	%
Attendance for workshop of SP	131	46.6	150	53.4
Needing more information about SP.	235	83.3	47	16.7
Having IC unit.	210	74.5	72	25.5
Having person responsible for IC.	221	78.1	62	21.9
Accreditation or licensed	94	34.8	176	65.2

Table 11: Knowledge score among healthcare workers in PHCs, Jeddah 2017

Total score	Mean ± SD	Range
	30.0±4.0	(17.0-36)
Knowledge category	N	%
Poor (<60%)	15	5.1
Good (60%-74%)	125	42.2
Very Good(75%-90%)	59	19.9
Excellent (>90%)	97	32.8

Table 12: Comparing knowledge level regarding demographic data among healthcare workers in PHCs, Jeddah 2017

		Mean	SD	P value
Educational level	Diploma	34.1	3	0.020*
	Bachelor	32	5.2	
	Master	34	2.8	
	Board	29	4.2	
Working position	Specialist	31.9	4.6	0.003*
	Resident	29.5	7.5	
	Dentist	32.2	3.3	
	Dental Assistant	32.6	4.7	
	Nurses	34.3	2.7	
	Pharmacist	34.5	2.8	
Salary	5000-10000	34.1	3.1	0.015*
	10001-20000	33.3	4	
	20001-30000	28.5	6.4	
	> 30000	32.3	5.5	

Table 13: Comparing knowledge level regarding working place, experience and accreditation in PHCs, Jeddah 2017

		Mean	SD	P value
Number of patients seen daily	0-25	29.3	5.1	0.214
	26-50	27.9	5.4	
	51-75	28.1	6	
	76-100	27.4	5.1	
Working setting	Clinic	27.9	5.1	0.057
	Antenatal clinic	25.5	4.5	
	Well baby clinic	31.5	6.1	
	Vaccination clinic	29.3	6.1	
	Triage	30.7	5.5	
	Dental clinic	28.6	5.2	
	Other	29.2	5	
Accredit PHCs	Yes	29.2	5.2	0.513
	No	28.7	5.6	
Years of experience	0-5	27	5.5	0.019
	6-10	28.4	5.2	
	>10	29.3	5.4	

Regarding general knowledge on standard precaution, about 17% of the participant knew that hand washing is a basic concept of SP before and after contacting patient.

About 2% know that cough etiquette are consider a basic concept of SP and About 98% of HCWs have good knowledge about potential ways of occupational hazard and body fluid that require SP.(Table 3)

Almost 90% or more of healthcare workers know the situation when to perform hand hygiene. The majority of the participant (97.8%) believe that must have hand hygiene After contact with blood, body fluids or contaminated surfaces. While, 89% of the participant believe that hand hygiene should be performed after removing gloves.(Table 4)

Regarding the knowledge in the use of PPE, about 92% know that gloves are used in dealing with a various body fluids, while 19% didn't know how to take off (doffing) PPE.(Table 5)

Majority of the participant (95%) believe that using regulated medical waste rules with field sharp container under injection safety practice. About 69% only knew that using centralized medication area for multi-dose vial under injection safety practice. The study reveal that 20% of participant they don't know that disinfecting medication vial with alcohol swab is under injection safety practice.(Table 6)

Majority of the participant (91%) know about proper practice of respiratory hygiene (Table 7).

Regarding knowledge about environmental cleaning 85% of participant believe that using cleaning material and disinfectant as manufacturer's instructions is required, while 77% know that the availability of high-touch surfaces is needed.(Table 8)

The majority of participant (50.2%) claimed that educational courses are the main source of information for SP, followed by scientific journal (14%) and 10% of the participant getting information from mass media.(Table 9 & Figures 1-5)

Regarding educational needs assumed that 83% of the participant mention that they need more information about SP. About 47% of participant want to get more knowledge by attending workshops for SP. (Table 10)

Regarding scoring the knowledge questions; one was given to the right answer. The right answer is (yes) for all questions. Summation of scores computed and the total score was 36, and the range was (1-36).

Then the score was transformed to a percentage which was categorized into excellent, who got $\geq 90\%$ or (>32), very good, for those who got 76% to 89% or (27-32) as a mean score, good, who got between 60% to 75% or (21.6 - 27) as a mean score and poor, who got $<60\%$ or (<21.6) as a mean score.

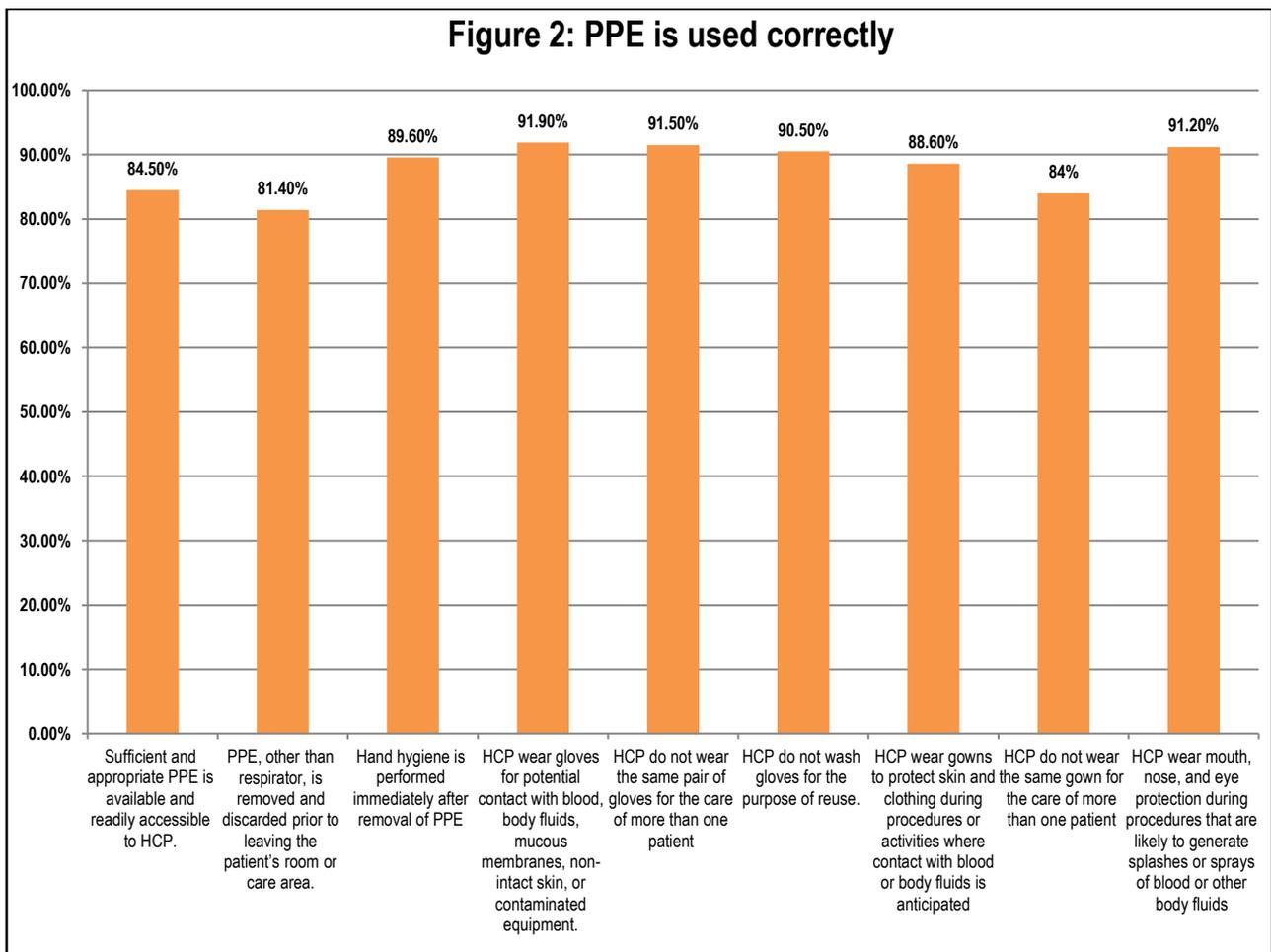
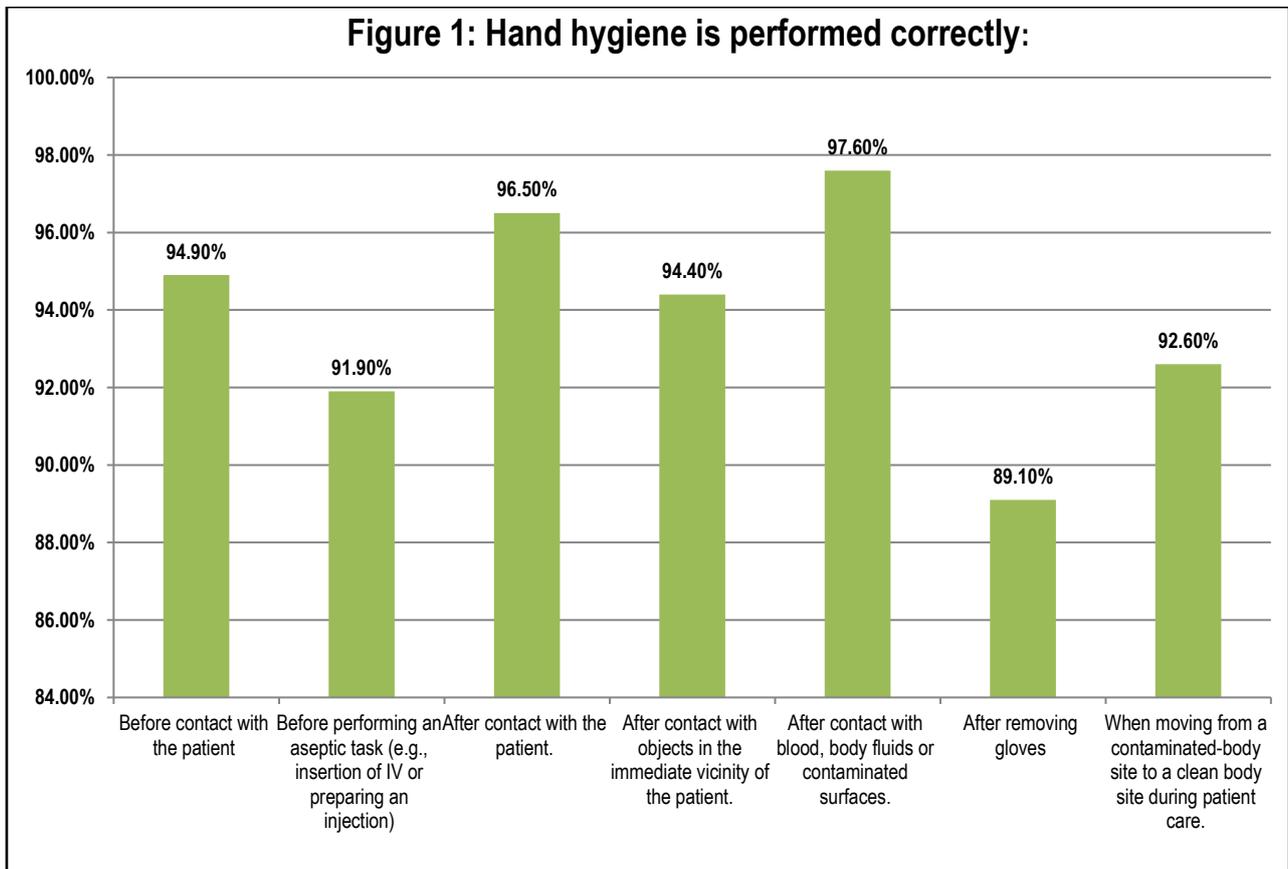
After considering an overall score 60% as passing score, about 95% of the participant passed the knowledge score. Only 5% of the participant got poor score ($< 60\%$). (Table 11)

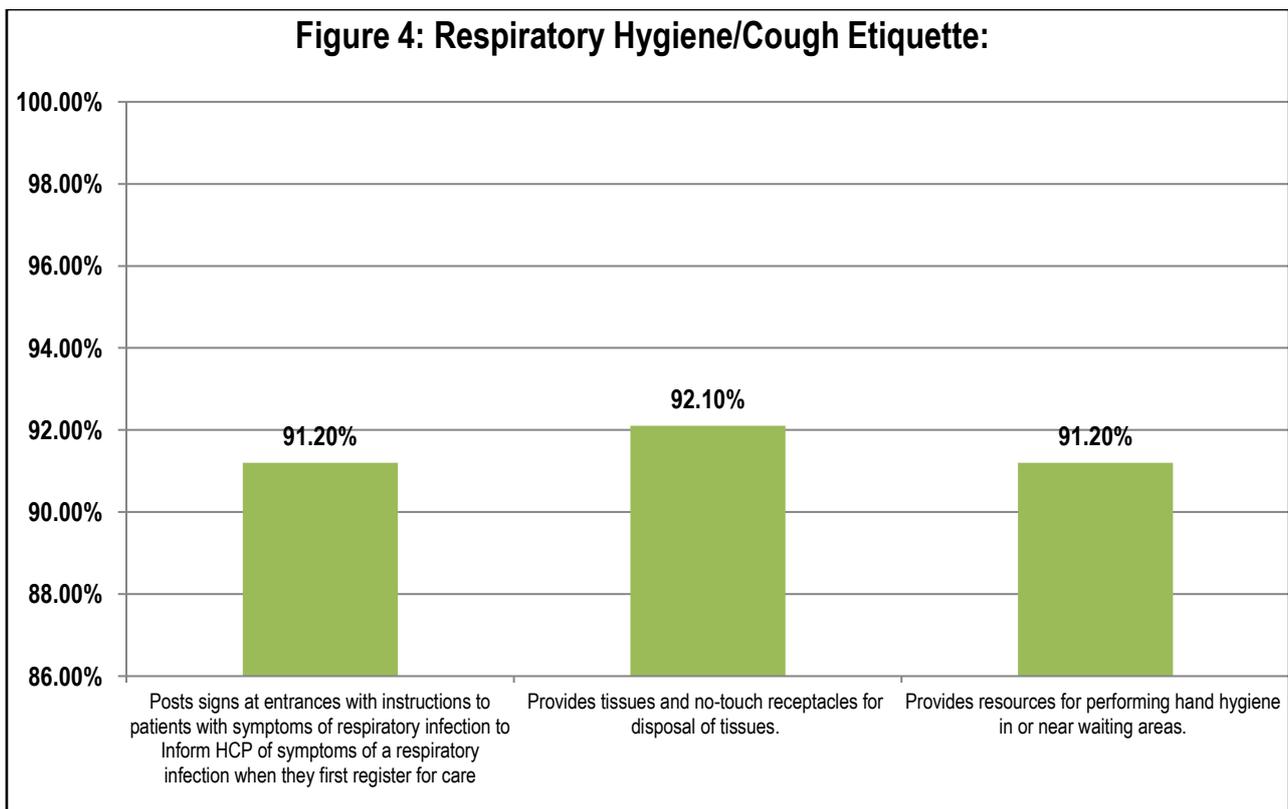
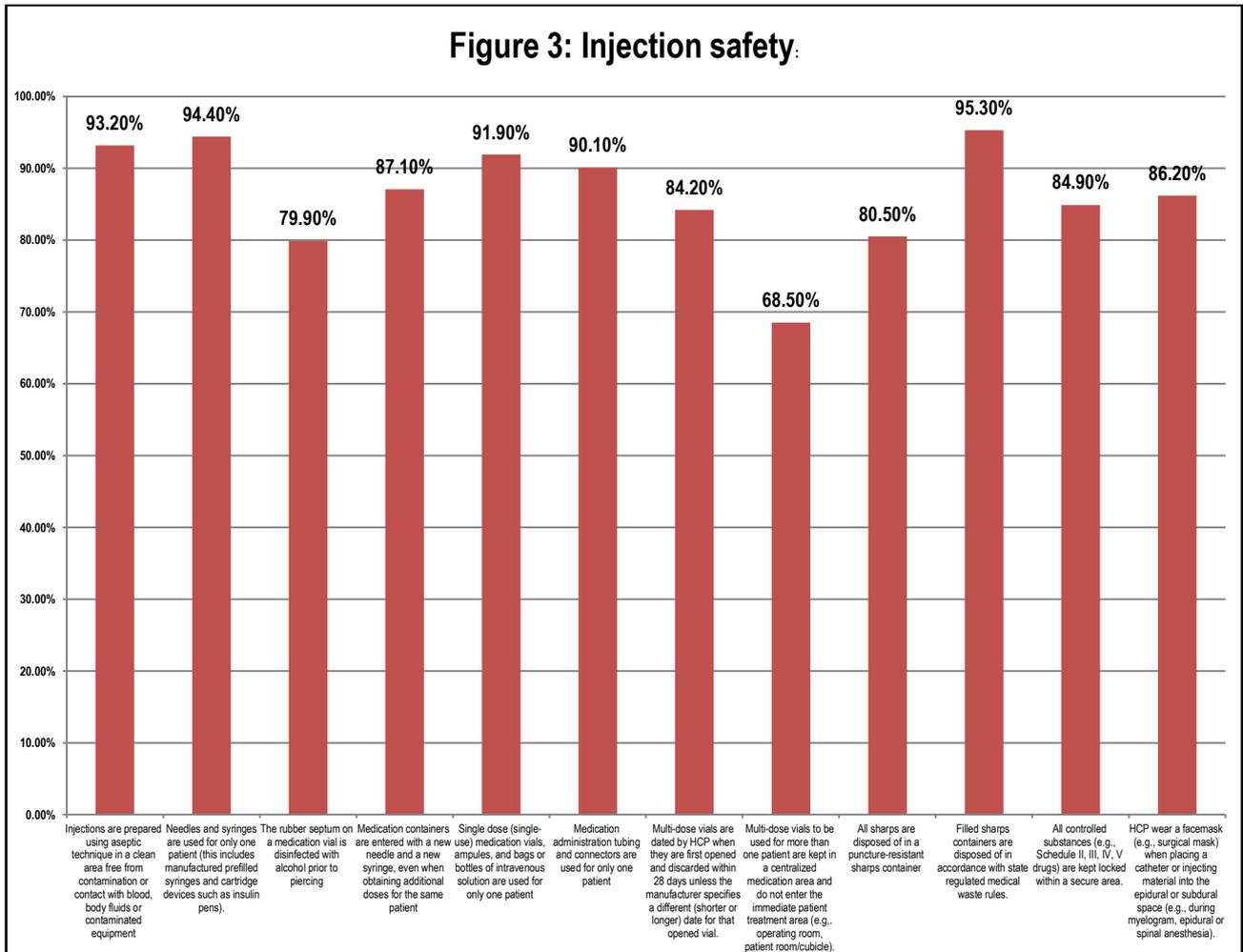
The study showed a significant difference in knowledge level regarding demographic data, where nurses, those with diploma and those with salary 5000-10000 had the higher rate of knowledge than others. On the other hand, there was no significant difference regarding age, gender and marital status.(Table 12)

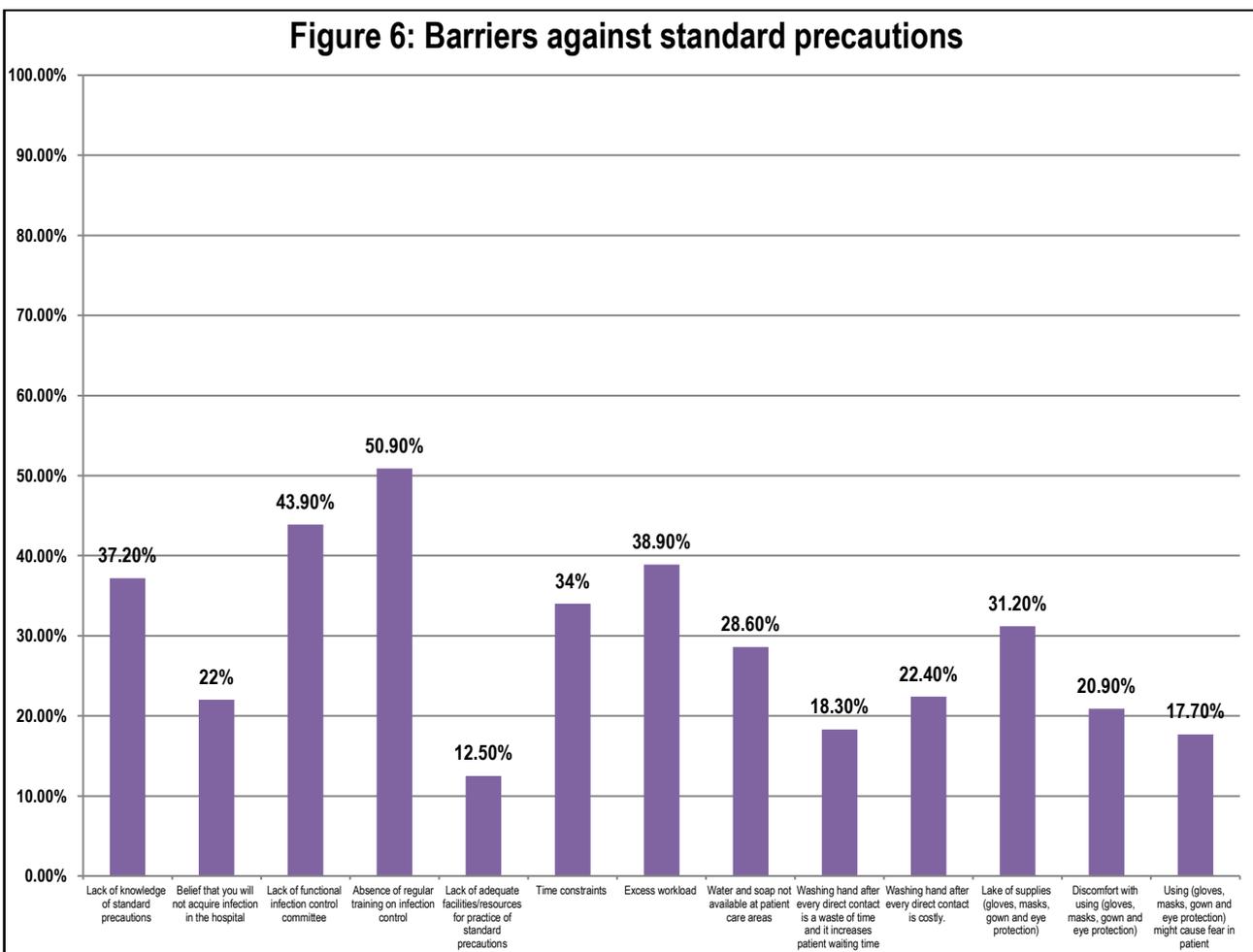
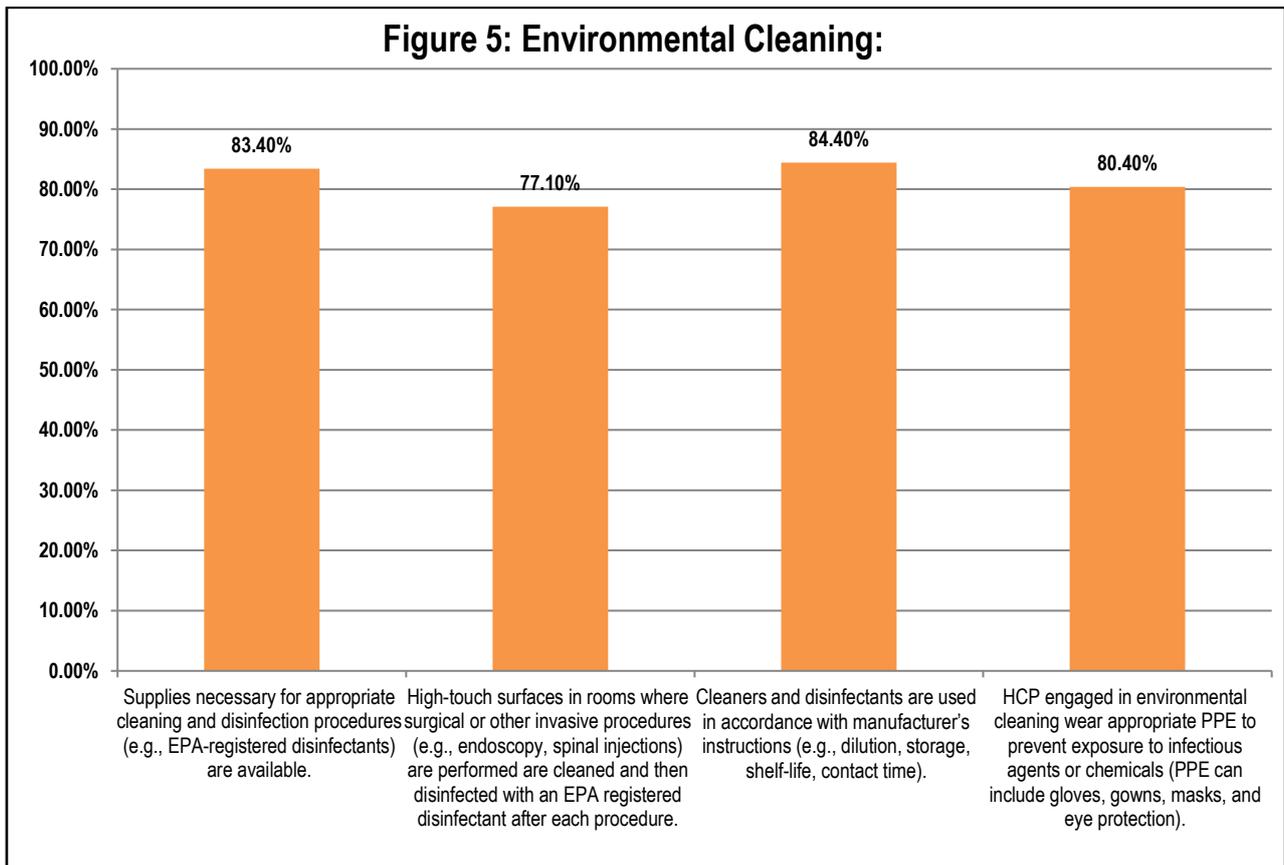
The study showed that participant who approach between 0-25 patients in a daily basis has higher knowledge score regarding SP than those who see more than 75 patient per day.

Participant working in antenatal clinic has the lowest knowledge mean score (25.5/36) while those who work in a well-baby clinic get the highest knowledge mean score (31.5/36) with p value 0.057.

The study also showed that participants with up to 5 years working experience has the lowest knowledge mean score (27/36) while those who has more than 10 year of working experience get the highest knowledge mean score (29.4/36) with p value 0.019.







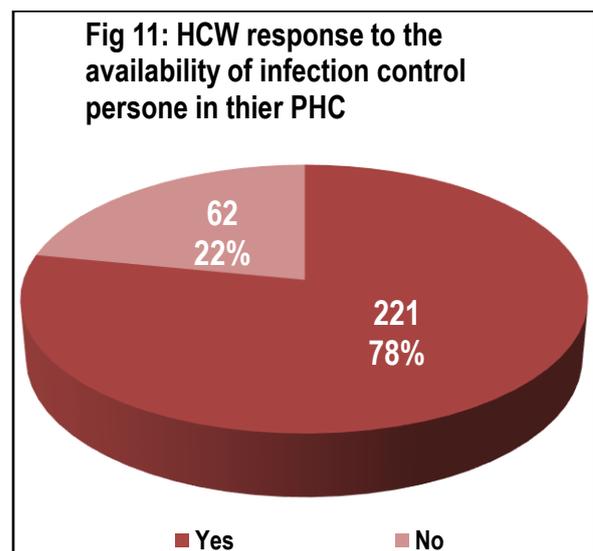
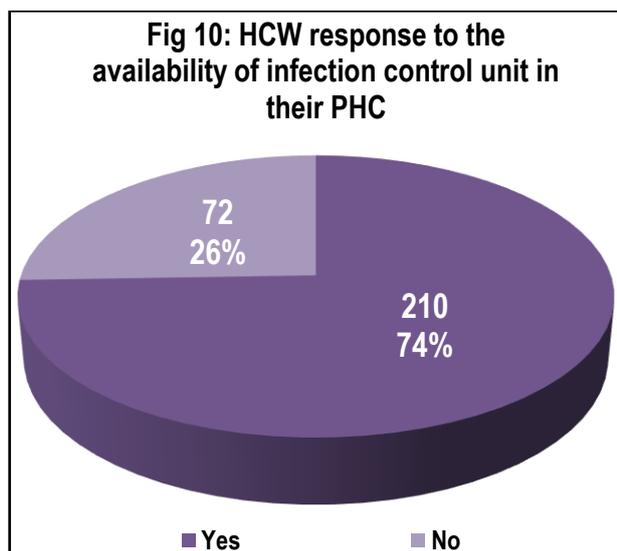
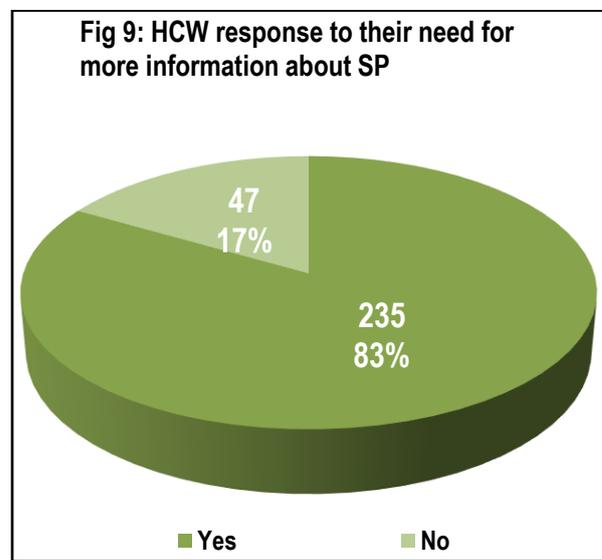
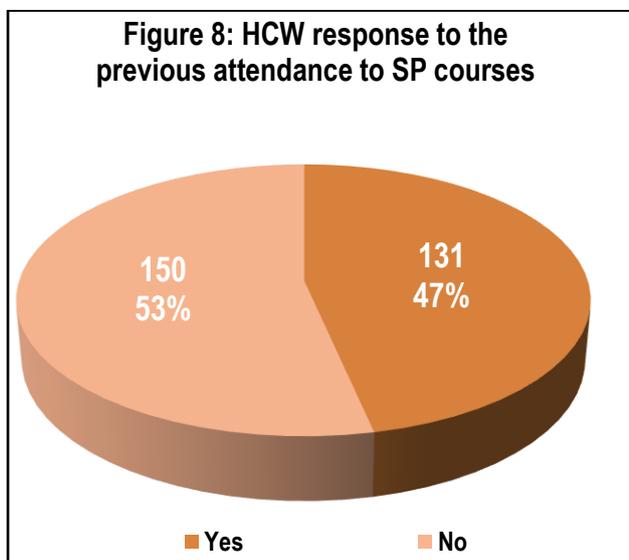
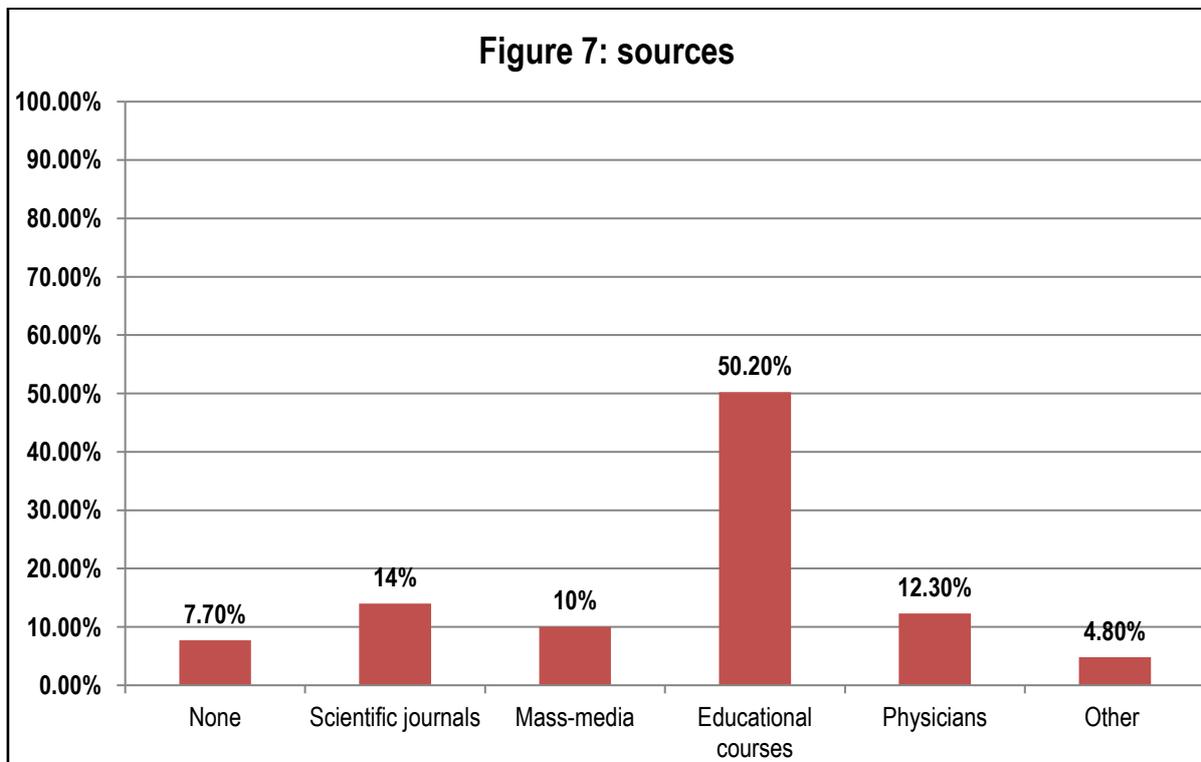


Fig12: HCW response to the presence of accreditation for their PHC

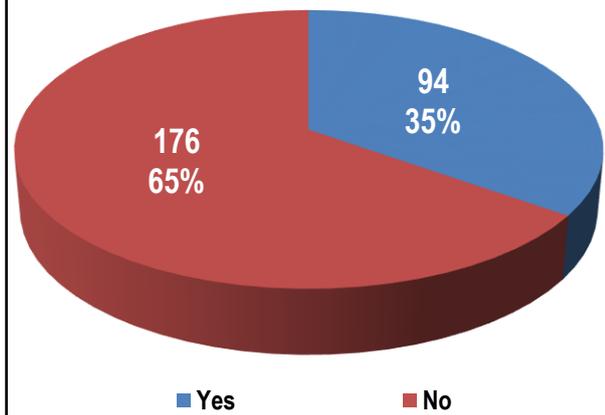
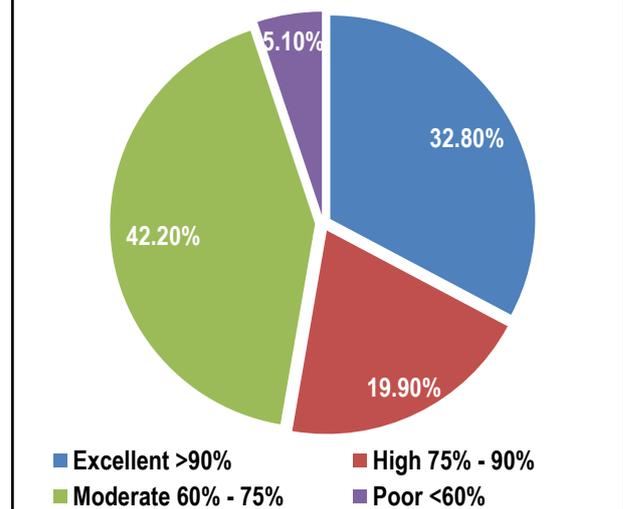


Fig 13: Knowledge score among HCW in PHC, Jeddah 2017



DISCUSSION

Health care workers (HCWs) always were facing occupational hazards during performing their clinical activities in hospitals. They are prone to blood infections from pathogens such as human immunodeficiency virus (HIV), hepatitis B virus (HBV) and hepatitis C virus (HCV), as well as from injuries and contact with deep body fluids.⁷

This study aimed to assess the knowledge about the standard precautions and to identify factors associated among health care worker in primary health centers, ministry of health, Jeddah 2017.

The results of this study showed that the majority (90.0%) of participants had good level of knowledge. Similar result was found in Nigerian study, the authors reported that (88.8%) had good level of knowledge.⁹ While study conducted in Afghanistan revealed that, the participant shows less than half had adequate knowledge.⁷ In Saudi Arabia, only 44.4% had good level of knowledge.⁵ Also in Nepal stud, only 41.0% had good level of knowledge.⁶ These result showed that the average levels of standard precaution was common problem and have been reported by several studies. This difference could be due to the variety of socio-economic factors, and geographic areas.

In the current study the highest knowledge level were for the following domains: hand hygiene, respiratory Hygiene/Cough Etiquette, and injection safety. Similar results were found in AL-Hassa study, where the author reported that good knowledge was in the following domains: hand hygiene, sharps disposal, management of sharps injuries and environmental cleaning.⁵

One study in Afghanistan revealed that, the highest rate was for two questions “application of SP to all patients regardless of their infectious status” and “HCWs with non-intact skin who should not be involved in direct patient care until the condition resolves”. While the knowledge was inadequate for all other questions.⁷

While in Nepal study, the main reason for non-compliance to SP were irregular supply of materials (31%); lack of an autoclave and other high-level disinfection equipment (50%); lack of knowledge and insufficient technical skills regarding universal precaution procedures (20%).⁶

In the current study the main sources of information for standard precaution was educational courses which is similar to Nigerian

study⁹ and this is expected as most of the health workers do attend several seminar and workshop for on the job training and retraining.

The findings of the present study showed that participants' knowledge grades regarding standard precaution were significantly higher among nurses, those with diploma degree, those with experience more than 10 years, and those with lower monthly income.

According to nurse position, this could be due to the facts that nurse are the most common healthcare workers to contact with patients, giving medication, preparing them for examination, and took them to the lab and radiology.

The study of Nigeria found that higher level of knowledge was among female, nurse, and those with experience more than 6 years⁹ while in Afghanistan study, female showed lower knowledge level than male (adjusted OR = 0.20, 95% CI: 0.08-0.51, p < 0.01), as well as those aged between 31 and 39 years compared with those younger than 30 years (adjusted OR = 0.28, 95% CI: 0.11-0.69, p < 0.01).⁷

Also, in Ethiopia study, female, younger age, those who received training on SP, and those who worked in room with written guideline showed higher level of knowledge and practice than other.⁸

LIMITATIONS

Time shortage, the researcher finished the data gathering within one month only and this study was conducted only at Jeddah.

CONCLUSION

Based on the findings of the study, the following can be concluded:

- The majority of the participants had good knowledge level.
- The highest knowledge level were for the following domains: hand hygiene, respiratory Hygiene/Cough Etiquette, and injection safety.
- Participants' knowledge grades regarding standard precaution were significantly higher among nurses, those with diploma degree, and those with lower monthly income.
- The main information resources were educational courses.

- More than half reported that they didn't attend any training courses of standard precaution.
- Two thirds of the participants reported that their health care centers are neither accredited nor licensed.

RECOMMENDATIONS

Based on the findings of the study, the following is recommended:

- Encourage the healthcare workers to adhere to the standard precaution.
- To use various educational materials about the importance of standard precautions to be distributed to the healthcare workers.
- To present the key findings to strategy and policy makers and stakeholders to help in designing a national guideline about standard precaution.
- The administrators in MOH should design and organize courses and workshops targeting healthcare workers, to raise their awareness and skills about standard precaution.
- Further nation-wide studies on assessment of healthcare workers' knowledge and practice regarding standard precaution need to be conducted in larger sample size and regions other than Jeddah, so as to identify the level and distribution of different knowledge grades as well as the areas and topics of knowledge shortages.

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