



Nurses' Performances Regarding Infection Control Standard Precautions at Shar Teaching Hospital in Sulaimani City

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ABSTRACT

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Background: Standard precautions include hand washing, protective equipment, respiratory hygiene, sharps safety, injection techniques, patient care, waste disposal, and disinfected surfaces for infection control.

Objectives: The study aimed to evaluate Nurses' Performances Regarding Infection Control Standard Precautions, and the Association between the Practices of Nurses and Sociodemographic Characteristics.

Methodology: This study used a descriptive observational design to study 212 nurses in all departments at Shar Teaching Hospital in Sulaimani. A probability-based sampling method was used, and data were collected from March 15, 2022, to September 20, 2022. The questionnaire involved questions about the nurses' demographics and their work environment.

Results: The result of the study indicates that (39.6%) of the nurses have good performance regarding infection control standard precautions, and there was a statistically significant association between nursing performance concerning age, level of education and employment.

Conclusion: Only half of the participants had good infection control practices. Factors that affected this level of practice were found.

Keywords: infection control, standard precautions, nurses.

INTRODUCTION

Healthcare-associated infections (HAI) are a major public health problem that affects morbidity, mortality, and quality of life. At any given time, up to 7% of patients in developed countries and 10% in developing countries will contract an HAI. These infections also have a significant financial impact on

the healthcare system (NCDC; Directorate General of Health Services, 2020).

Health-associated infection (HAI) is an infection that develops in a specific or vast scope in the hospital as a result of pathogenic reactions associated with the infectious agent or its toxins (but

only if the infection occurs within 48 to 72 hours of admission or a specific period of 3 to 10 days after discharge). As a result, the patient must be free of infection symptoms at admission, and the infection must not be in the incubation stage. According to a study by the World Health Organization (WHO) on 55 hospitals in 14 countries, 8.7% of patients admitted to these hospitals contracted a healthcare-associated infection (Sarani et al., 2015).

The World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) suggest standard precautions (SPs) in healthcare settings to reduce the risk of transmission of blood-borne and other infections from both identified and unidentified sources of infection. The fundamentals of nursing practice include infection control and preventive methods. By using the fundamental principles of infection prevention measures, standard precautions (SPs) are aimed at protecting healthcare staff and patients from exposure to possibly infected blood and body fluids (Greeb et al., 2018).

When the focus is on the patient's safety, infections related to health facilities are particularly concerning. Health Care-associated Infections (HCAI), also known as "hospital-acquired infections," are the most common adverse effect studied from hospitalization and the main public health problem in developed and developing countries due to morbidity, mortality, prolonged hospitalization, and negative effects on the patient and the nation's economic well-being (Valim, 2016).

The incidence of negative health occurrences is a sign of a patient's safety being jeopardized. Adverse health problems are reported to occur anywhere from 4% and 17% of the population worldwide. Surprisingly, almost half of all recorded adverse events that risked patient safety were judged to be preventable (Killam et al., 2017).

Therefore, To create and implement an effective infection prevention and control (IPAC) program in any healthcare setting, it is necessary to examine the practice of Standard Precaution (SPs) of infection control among diverse Health Care Workers (HCWs).it is also important to Identify and overcome the knowledge-practice-compliance gap.

AIMS OF THE STUDY

To evaluate Nurses' Performances Regarding Infection Control Standard Precautions at Shar Teaching Hospital in Sulaimani City. and the Association between the Practices of Nurses and Sociodemographic Characteristics.

METHODOLOGY

Research design:

A descriptive observational design.

Research setting:

The study was conducted at Shar Teaching Hospital in Sulaimani City, which consists of 400 beds. It is a multi-department hospital that consists of an emergency, Medical Ward, Surgical Ward, ICU, CCU, Urology, Nephrology, Dialysis, Neurology, Neurosurgery, Orthopedic, Operation Room, and Outpatient) departments, Shar Teaching Hospital receives all kinds of patients regardless of whether they have an infection.

Sample size:

the sample size was 212 nurses from each department of Shar Teaching Hospital; they were chosen according to the inclusion and exclusion criteria of the research.

Inclusion criteria for sample selection:

1. The nurses are responsible for providing nursing care for the patients in all departments at Shar Teaching Hospital.
2. All levels of nursing education.
3. The nurse who had at least one year of experience and above.

Exclusion Criteria:

1. The nurses had an administrative role only as the head nurses.
2. The nurse will not be available during the period of data collection.
3. Any nurse who disagrees with participating in this study.
4. Nurses who work as volunteers

Sample type:

A probability, stratified random sampling.

The Study Instruments and Tools:

Two study instruments were utilized for proper data collection (Questionnaire and Observational checklist)

The researcher modified the study instruments to investigate nurses' performances regarding infection control standard precautions at Shar Teaching Hospital; it was based on an extensive review of related literature and studies.

First study instrument (questionnaire)

The questionnaire consisted of two parts:

Part I: (Sociodemographic Data):

This part includes demographic data of nurses, and it consisted of (14) items, including age, gender, level of education, marital status, working department, employment, working shifts, and items about training and years of experience.

Part II: (Information Related to the Setting of the Study):

This part includes (7) items that consist of questions related to the availability of training programs and guidelines in departments of Shar Teaching Hospital, Personal Protective Equipment (PPE) and Hand Washing, as items related to the availability of suitable waste bins according to the type of waste, and central sterilization supply department (CSSD).

Second Study Instruments (Observational Checklist)

The checklist modified by the researcher is based on the Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (CDC, 2019), Practical Guidelines for Infection Control in Health Care Facilities (WHO, 2004), and Infection Prevention and Control Assessment Tool for Outpatient Settings (CDC, 2016), and scoring was done as follows; Sample(212), Not Done practice (0), Done Incorrectly practice (1) and Done Correctly practice, Then the total score (424) The scale of the practice of nurses was classified as poor practice (<50%) with a score (0 – 211), Fair practice: (50% - < 75%) with a score (212 – 317) and good practice (\geq 75%) with a score (318-424).

Reliability:

Cronbach's alpha was used to obtain the final result of reliability, and the information of the question was obtained from the participation twice to make the hones of the respondents, the result of the reliability was 0.904. As a result, the respondents to the questionnaire were reliable.

Statistical Methods:

All statistical computation is enhanced using the statistical method SPSS version 24. The data were coded, tabulated, and presented in a descriptive form. The statistical procedure that was applied to determine the results of the present study includes.

Inferential data analysis:

1. Chi-Square Test.
2. Spearman Rank correlation.

There are criteria of the probability level of determining the significance of the test: P -value as:

1. High significant ($P < 0.001$).
2. Significant ($P < 0.05$).
3. Non-significant ($P > 0.05$).
4. Very highly significant ($P < 0.000$).

Limitations of the study

Throughout the study, there were difficulties and barriers faced by the researcher, which are mentioned as follows:

1. It is difficult for the nurses to provide time to fill out the questionnaire, especially in the emergency units and operations.
2. The study sample was small, which prevented the result from generalization.
3. Observation of the number of nurses took more than one day.
4. Refusing to participate in the study by the nurses due to personal information and anxiety regarding giving their names to the hospital directories.
5. Lack of new study references related to the present study.
6. Transportation was an issue for the researcher.

RESULTS**Table (1):** sociodemographic characteristics of nurse participants

Characteristics	Frequency	%
Age (Years)		
< 30	56	26.4
30 – 40	128	60.4
More than 40	28	13.2
Mean \pm S.D	33.41 \sim 33 \pm 6.47	
Level of education		
Nursing School graduated	0	0.0
Secondary Nursing School graduated	6	2.8
Nursing and Midwifery Institute graduated	139	65.6
College of Nursing graduated	67	31.6
Master and more	0	0.0
Gender		
Male	70	33.0
Female	142	67.0
Department of		
Cardiothorasic + neurosurgery	17	8.0
cath lab	6	2.8
Dialysis	10	4.7
emergency medicine	12	5.7
Icu	8	3.8
medical ward	16	7.5
Neurology	22	10.4
Ogd	2	.9
Operation	44	20.8
orthopedic+ surgery	19	9.0
short stay	18	8.5

	surgery emergency	11	5.2
	Trauma	21	9.9
	Triage	6	2.8
Marital Status			
	Married	153	72.2
	Single	59	27.8
	Separated or Widowed	0	0.0
Employment			
	Government	183	86.3
	Contract	29	13.7
	Total	212	100.0

Table (1) shows the nurse's sociodemographic characteristics. The majority of the participants were between 30 and 40 years old, representing (60.4%), and only 26.4% were less than 30 years old. Regarding education, the majority of the nurses graduated from an institute (65.6%). Most participants in the study (67.0%) were females. (20.8%) of the nurses worked in the operation department, (10.4%) of the participants worked in the neurology department, and (0.9%) of the nurses worked in the OGD department. (72.2%) of the participants are married. Most participants (86.3%) of the nurses were employed by the government.

Table (2): Distribution of characteristics related to the nurse profession and years of experience

Characteristics	Frequency	%
Working Shifts		
Morning shift	69	32.5
Afternoon shift	143	67.5
Are you working with a private hospital?		
Yes	66	31.1
No	146	68.9
Number of years of total service		
< 5	22	10.4
5 – 10	135	63.7
> 10	55	25.9
Mean ± S.D	9.61 ~ 10 ± 5.59	
Number of years of service (experience) in the Shar Hospital		
< 3	61	28.8
3 – 6	72	34.0
> 6	79	37.2
Mean ± S.D	5.24 ~ 5 ± 3.12	
Training courses related to infection control		
Yes	64	30.2
No	148	69.8
If yes : - Total duration of the course (Days)		
< 5	25	39.06
5 – 10	22	34.38
> 10	17	26.56
Total	64	100.0
Time from last training (Years)		

< 3	18	28.13
3 – 6	37	57.81
> 6	9	14.06
Total	64	100.0
Do you have previous information about infection control		
Yes	190	89.6
No	22	10.4
If yes, where did you get the information		
Studying	153	55.4
Workshop	22	8.0
Training and development	61	22.1
Audio and visual media	30	10.9
Others	10	3.6
Total	276	100
Did you get exposed to blood and body fluids while working in a hospital?		
Yes	208	98.1
No	4	1.9
Total	212	100.0

Table (2) shows the distribution of characteristics associated with the nurse profession and years of experience. Most nurses (67.5%) work the afternoon shift. Only 31.1% of nurses work in a private clinic. Additionally, most nurses have worked for 5 to 10 years (63.7%). Only 37.2% of nurses have more than 6 years of experience. In addition, only 30.2% of nurses have infection control training, only 26.56% have more than 10 days of the infection control course, and 57.81% have between 3 and 6 years since the last training. However, 89.6% of nurses have prior infection control information, 55.4% have studied to receive information about infection control, and 98.1% of nurses are exposed to infection while working in the hospital.

Table (3): Distribution of characteristics related to information about the setting of the study

Characteristics	Frequency	%
Do you have a periodic educational program in your department regarding infection control?		
Yes	0	0.0
No	212	100.0
Are infection control guidelines available in your department?		
Yes	89	42.0
No	123	58.0
Does Personal Protective Equipment (PPE) available in your department		
Surgical Mask	211	13.28
N95 mask	44	2.77
Clean Gloves	210	13.22
Sterile gloves	206	12.96
Gown	203	12.78
Goggles	74	4.66
Apron	92	5.79
Face shield	60	3.78
Caps	112	7.05
Shoe cover	93	5.85

Boots	51	3.21
Clinical waste bag	196	12.33
Full cover gown	37	2.33
Total	1589	100.0
Does hand washing equipment available in your department		
Sink with running water	205	25.37
Soap	198	24.50
Tissue	199	24.63
Alcohol hand rubs	206	25.50
Total	808	100.0
Does your department has different waste bins according to the type of the waste		
Medical waste yellow	211	49.53
General waste black	209	49.06
Glass waste blue	4	0.94
Infectious waste red	2	0.47
Total	426	100
Does your department has a sharp box for sharp disposals		
Yes	212	100.0
No	0	0.0
Does the central sterilization supply department (CSSD) available at the hospital		
Yes	212	100.0
No	0	0.0
Total	212	100.0

Table (3) illustrates the distribution of characteristics related to information about the setting of the study. All of the participants (100.0%) of the nurses said that they did not have a regular departmental training program on infection control, (and 58%) of nurses did not have an infection control policy in the unit. On the other hand, The majority of personal protective equipment was a surgical mask (13.28%) and (13.22%) were clean gloves available as personal protective equipment, (25.5%) of participants had hand rubs with alcohol to wash equipment, and (25.37%) of participants had sinks with running water to wash equipment and only (24.5%) of participants had soap to wash equipment disposal. Most waste bins were also medical yellow (49.53%) and (49.06%) general waste black. Most of the departments' participants (100%) have a sharp disposal box. Then (100.0%) of the participants have the central sterilization supply department available.

Table (4): Number of questions, range, scores, and levels of (practices) during the evaluation of nurses' performances regarding infection control standard precautions

Practices of nurses	No. items	Total scores	Range	Min	Max	(<50%)	(≤50% -75%)	(≥75%)		
						Poor	Fair	Good		
Hand washing	17	34	0-34	0	32	0-16	17-25	26-34		
Personal Protective Equipment	22	44	0-44	0	44	0-21	22-32	33-44		
Safe injection practice	14	28	0-28	0	28	0-13	14-20	21-28		
Respiratory Hygiene and Cough Etiquette	3	6	0-6	0	6	0-2	3-4	5-6		
Patient Care Equipment	2	4	0-4	0	4	0-1	2	3-4		
Safe Management of Line	4	8	0-8	0	8	0-3	4-5	6-8		
Waste Disposal	3	6	0-6	0	6	0-2	3-4	5-6		
Clean and Disinfect Environmental Surfaces	2	4	0-4	0	4	0-1	2	3-4		
Total of practice	67	134	0-134	0	134	0-66	67-99	100-134		
Levels		Poor			Fair		Good	Total		
		Fr.	%		Fr.	%	Fr.	%	Fr.	%
Hand washing		66	31.1		87	41.0	59	27.8	212	100
Personal Protective Equipment		44	20.8		101	47.6	67	31.6	212	100
Safe injection practice		43	20.3		96	45.3	73	34.4	212	100
Respiratory Hygiene and Cough Etiquette		17	8.0		95	44.8	100	47.2	212	100
Patient Care Equipment		28	13.2		105	49.5	79	37.3	212	100
Safe Management of Line		108	50.9		61	28.8	43	20.3	212	100
Waste Disposal		56	26.4		89	42.0	67	31.6	212	100
Clean and Disinfect Environmental Surfaces		19	9.0		76	35.8	117	55.2	212	100
Total of practice		47	22.2		81	38.2	84	39.6	212	100

Table (4) shows the distribution of the number of questions, range, scores, and levels of (practices) during the evaluation of nurses' performances regarding infection control standard precautions, the results demonstrate that the nurses had good practice in respiratory hygiene and cough etiquette, and clean and disinfect environmental surfaces, fair practice regarding a majority of items, hand washing, personal protective equipment, safe injection practice, patient care equipment, and waste disposal, they had poor practice regarding safe management of linen.

Table (5): Association between the practices of nurses and sociodemographic characteristics

Variables	Items	Score of Practice						Significant Test
		Poor		Fair		Good		
		Fr.	%	Fr.	%	Fr.	%	
Age (Years)	< 30	20	42.55	23	28.40	13	15.48	$\chi^2 = 13.693$
	30 – 40	24	51.06	49	60.49	55	65.48	P=0.008
	More than 40	3	6.38	9	11.11	16	19.05	
Level of education	Secondary Nursing School	2	4.26	3	3.70	1	1.19	$\chi^2 = 15.257$
	Nursing and Midwifery Institute	33	70.21	61	75.31	43	51.19	P=0.004
	College of Nursing	12	25.53	17	20.99	40	47.62	
Gender	Male	17	36.17	26	32.10	27	32.14	$\chi^2 = 0.271$
	Female	30	63.83	55	67.90	57	67.86	P=0.873
Marital Status	Married	32	68.09	60	74.07	61	72.62	$\chi^2 = 0.545$
	Single	15	31.91	21	25.93	23	27.38	P=0.761
Employment	Government	33	70.21	75	92.59	75	89.29	$\chi^2 = 13.651$
	Contract	14	29.79	6	7.41	9	10.71	P=0.001
Total		47	100	81	100	84	100	

Significant Test at the level of significant 0.05, If (P-value <0.05) is significant, The significant Test is Chi-Square Test.

Table (5) shows the association between the practices of nurses and sociodemographic characteristics. A result shows that there was a statistically significant association between nurses' practice with age (p-value=0.008), level of education (p-value=0.004), and employment (p-value=0.001) because the result of the p-value was less than the common alpha 0.05. While there was no statistically significant association between nurses' practice with gender (p-value=0.873) and marital status (p-value=0.761) because the result of the p-value was more than the common alpha 0.05. Moreover, nursing practice was no statistically significant association with working Shifts (p-value=0.06).

Table (6): Association between the practices of nurses and years of experience

Years of experience	Items	Score of Practice						Significant Test
		Poor		Fair		Good		
		Fr.	%	Fr.	%	Fr.	%	
Working Shifts	Morning	22	46.81	23	28.40	24	28.57	$\chi^2 = 5.595$
	Afternoon	25	53.19	58	71.60	60	71.43	P=0.06
working with a private hospital	Yes	15	31.91	17	20.99	34	40.48	$\chi^2 = 7.322$
	No	32	68.09	64	79.01	50	59.52	P=0.026
Number of years of total service	< 5	13	27.66	7	8.64	2	2.38	$\chi^2 = 24.613$
	5 – 10	29	61.70	50	61.73	56	66.67	P=0.000
	> 10	5	10.64	24	29.63	26	30.95	
Number of years of service (experience) in the Shar Hospital	< 3	28	59.57	22	27.16	12	14.29	$\chi^2 = 35.376$
	3 – 6	15	31.91	25	30.86	33	39.29	P=0.000
	> 6	4	8.51	34	41.98	38	45.24	
Training courses related to infection control	Yes	1	2.13	19	23.46	44	52.38	$\chi^2 = 38.932$
	No	46	97.87	62	76.54	40	47.62	P=0.000
Have previous information about infection control	Yes	34	72.34	75	92.59	81	96.43	$\chi^2 = 20.045$
	No	13	27.66	6	7.41	3	3.57	P=0.000
get exposed to infection while working in a hospital	Yes	44	93.62	81	100.0	83	98.81	$\chi^2 = 6.91$
	No	3	6.38	0	0.00	1	1.19	P=0.032
Total		47	100	81	100	84	100	

Significant Test at the level of significant 0.05, If (P-value <0.05) is significant, The significant Test is Chi-Square Test.

Table (6) shows that there was a statistically significant association between nurses' practice with working with a private hospital (p-value=0.026), number of years of total service (p-value=0.000), number of years of service (experience) in the Shar Teaching Hospital (p-value=0.000), Training courses related to infection control (p-value=0.000), previous information about infection control (p-value=0.000) and get exposed to blood and body splashes while working in a hospital (p-value=0.000). In contrast, the nursing practice was no statistically significant association with working Shifts (p-value=0.06).

DISCUSSION:

In the present study practice of 212 nurses regarding infection control standard precautions were evaluated through a questionnaire and observation checklist; regarding the result of the sociodemographic data of this study, the majority of

the age of participants (60.4%) were between (30-40) years old, most of them (65.6%) had diploma degree, gender-wise the females were more than males with the percentage of (67.0%), majority of the nurses (72.2%) were married, supported by a study done in Egypt the results demonstrate that 46.4% of the

research nurses were between the ages of 30 and 39, 71.3% were female, 76.2% were married, and 52.5% had a nursing diploma (Azab et al., 2021).

While a study was done in Saudi Arabia with opposite results to this study, results show that more than half of nurses (59.9%) were aged less than 30 years, and (55.7%) were males. Most of the participants (45.3%) had Bachelor's degrees (Al-Ahmeri, 2017).

Regarding the working shifts of the nurses, most of the nurses (67.5%) were on night shifts, which was opposite to a study done in Egypt; most of the nurses were on morning shifts (El-Enein & El Mahdy, 2011).

As for the working experience, this study shows that (63.7%) of the nurses have worked between (5-10) years in total. The majority of the nurses (69.8%) have not participated in an infection control training course. However, there was no periodic educational program in any of the departments of Shar Teaching Hospital regarding infection control, which is opposite to the result of a study done by Yohanis Asmr in Ethiopia. At the same time, the majority (74.0%) had less than five years of experience, and most of them (62.6%) had participated in training regarding infection control (Asmr et al., 2019).

However, in a study done in Egypt, the result is quite similar to this study as (40.0%) of the nurses have less than 10 years and more than five years of experience; also, most of them (80.0%) have not participated in the training course regarding infection control (Mohammed Ali Hassan et al., 2022).

About exposure of the nurses to blood and body fluids while working in a hospital majority of them (98.1%) answered yes, which is opposite to the result of the study held in Nigeria, in which the result came out to be (94.8%) not exposed (Amoran & Onwube, 2013).

Information related to the setting of the study was collected through seven questions regarding periodic educational programs; all the nurses

answered with (No), which means there is no educational program regarding infection control in any of the departments of Shar Teaching Hospital; all about guidelines regarding infection control (58.0%) of the nurses mentioned that there is no guideline in their department, while in research in Egypt, all the nurses mentioned that there are guidelines in their departments (Adly et al., 2020).

Regarding the availability of personal protective types of equipment, surgical masks, clean gloves, sterile gloves, gowns, and clinical waste bags were available in almost all the departments. Still, there was a lack of other personal protective equipment. A study proved that a lack of personal protective equipment was significantly associated with compliance (Haile T., 2017).

However, hand washing types of equipment were available in all departments, which is a good indicator that there is no barrier for the nurses to perform hand washing; it is proven by research that lack of hand washing types of equipment is agreed to be a strong barrier to perform hand washing (Azab et al., 2021).

All the departments had medical (yellow) and general (black) waste bins, while there was a lack of glass (blue) and infectious (red) waste bins in almost all the departments; however, poor medical waste management is related to the absence of waste management and disposal system; also the topic is a low priority in many countries (Babanyara et al., 2013).

On the other hand, the sharp box was available in all departments, which is supported by a study done in Palestine (97.4%) of the nurses answered the availability of sharp box in their departments (Fashafsheh Ahmad Ayed & Eqtaib Lubna Harazneh, 2015).

The central sterilization supply department was available at Shar Teaching Hospital. The central sterile supply department (CSSD) is critical in sterilizing and delivering expensive medical

equipment to various users throughout the hospital (Krageschmidt et al., 2014).

The results of the current study revealed that nurses had good practice in respiratory hygiene and cough etiquette, and clean and disinfecting environmental surfaces, fair practice regarding the majority of items, hand washing, personal protective equipment, safe injection practice, patient care equipment, and waste disposal, they had poor practice regarding safe management of linen.

Compared to the current study, a study in North Eastern Nigeria confirmed that only 38.7% of people practised hand hygiene (IS & MO, 2012). In another study in Egypt, results illustrate that while there was a satisfactory score level for handling sharps instruments, there was an unsatisfactory score level for hand washing and safe injection practice (Greeb et al., 2018). Research in Rwanda revealed that PPE was worn by 88.4 percent of the participants (Theogene Uwizeyimana et al., 2021). However, in a study in Egypt, results demonstrate that 80% of the nurses studied performed basic infection control procedures incorrectly, such as hand washing (85.7%), equipment processing (80%), personal protective equipment (77.1%), and avoiding sharp needle injuries (82.9%). While 22.9% and 25.7% of nurses correctly practiced disinfection and sterilization methods, respectively (Amin & Hossain, 2014).

The results show that there was a statistically significant association between nurses' practice with age (p -value=0.008), level of education (p -value=0.004), and employment (p -value=0.001). While there was no statistically significant association between nurses' practice with gender (p -value=0.873) and marital status (p -value=0.761), also, there was a statistically significant association between nurses' practice with working with a private hospital (p -value=0.026), number of years of total service (p -value=0.000), number of years of experience in the Shar Hospital (p -value=0.000), Training courses related to infection control (p -value=0.000), previous

information about infection control (p -value=0.000) and get exposed to blood and body fluids while working in a hospital (p -value=0.000). While nurses practice has no statistically significant association with working Shifts (p -value=0.06). In a study done in Egypt, the results show that there was a highly statistically significant relationship between the practice of the studied nurses and years of experience ($P < 0.01$), as well as a statistically significant relationship between their age and job title ($P < 0.05$). However, there was no significant relationship between their gender and marital status ($P > 0.05$) (Adly et al., 2020).

However, in another study done in Saudi Arabia, In terms of standard infection control precautions practice, the findings revealed that all participant characteristics are statistically associated with the level of standard infection control precautions practice. Previous infection control training ($p < 0.01$), more than 6 years of work experience ($p < 0.01$), or exposure to infection while working ($p < 0.05$) were all associated with better infection control practices. Gender and age were also found to be related to good practice ($p < 0.001$) (Abalkhail et al., 2021).

Even so, in another study done in Abha City in Saudi Arabia, According to statistical analysis, participants' good practice was significantly associated with years of experience and receiving an infection control training program (P values = 0.032, 0.040, respectively) (Al-Ahmeri, 2017).

The study's result indicates a statistically significant association between nursing knowledge and nursing practice (p -value = 0.000), which is supported by a study done in Pakistan, that their result indicates that the relationship between knowledge and practice is significant and positive. As a result, knowledge is extremely important and has a significant impact on practice (Ather et al., 2020).

Also, Alice et al. found that good practice was significantly associated with good standard precautions knowledge ($p = 0.02$) (Alice et al., 2013).

CONCLUSIONS:

In contrast, the present study concluded that less than half of the participants had good practices regarding infection control standard precautions. Some factors affecting the level of their practice, age, working in a private hospital, years of experience, and training courses related to infection control were significantly associated with the practice.

RECOMMENDATIONS:

Providing training programs on standard precautions for newly employed nurses at regular intervals.

The quality team must strictly monitor nurses' performance of standard precautions and correct poor practices.

The availability of guideline posters for nurses to follow conform with standard precautions at Shar Teaching Hospital.

Continues to monitor for factors predisposing to noncompliance with standard precautions in Shar Teaching Hospital.

Future research is to be conducted to determine the obstacles and barriers to the application of infection control standard precautions in nursing practices.

ETHICAL CONSIDERATION

The proposal of the present study was approved by the ethical committee/ College of the Medicine/ University of Sulaimani.

The council of the College of Nursing accepted this study. Accordingly, official permission was proposed to the Sulaimani General Directorate of Health to grant the permission, consequently, Shar Teaching Hospital to gain facilitation and cooperation during the data collection of this study, and verbal consent was taken from the nurses before evaluation.

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ETHICAL APPROVAL:

The study received approval from the institutional ethics committee.

Disclosure

In this research, no financial disclosures are required, and no conflicts of interest exist.

REFERENCES:

- Abalkhail, A., Hassan, M., Imam, A., Elmosaad, Y. M., Jaber, M. F., & Ho-, K. Al. (2021). Knowledge, Attitude and Practice of Standard Infection Control Precautions among Healthcare Workers in a hospital in Qassim , Saudi Arabia : a Cross-sectional Survey. October.
- Adly, R. M., Ismail, S. S., Mohamed, S., & Saleh, A. (2020). Assessment of Nurses' Knowledge and Practices Regarding the Application of Safety Standard Precautions in Pediatric Critical Care. 7(3), 524–543.
- Al-Ahmeri, A. M. (2017). Knowledge, attitude and practice about infection control among primary care professionals in Abha City, Kingdom of Saudi Arabia Ahmed. *Journal of Family Medicine and Primary Care*, 6(2), 169–170. <https://doi.org/10.4103/jfmipc.jfmipc>.
- Alice, E. T., Akhere, D. A., Ikponwonsa, O., & Grace, E. (2013). Knowledge and practice of infection control among health workers in a tertiary hospital in Edo state, Nigeria. *Direct Research Journal of Health and Pharmacology (DRJHP)*, 1(2), 20–27.
- Amin, M. R., & Hossain, M. A. (2014). *Original Article In Silico*. 31(1), 53–58.
- Amoran, O. E., & Onwube, O. O. (2013). Infection control and practice of standard precautions among healthcare workers in northern Nigeria. *Journal of Global Infectious Diseases*, 5(4), 156–163. <https://doi.org/10.4103/0974-777X.122010>.

- Asmr, Y., Beza, L., Engida, H., Bekelcho, T., Tsegaye, N., & Aschale, Y. (2019). Assessment of Knowledge and Practices of Standard Precaution against Blood Borne Pathogens among Doctors and Nurses at Adult Emergency Room in Addis Ababa, Ethiopia. *Emergency Medicine International*, 2019, 1–8. <https://doi.org/10.1155/2019/2926415>.
- Ather, H., Khan, A., & Shabnum, S. (2020). Knowledge and Compliance Toward Standard Precaution Among Health Care Workers at Bahria International Hospital Lahore, Pakistan. *International Journal of Social Sciences and Management*, 7(1), 17–20. <https://doi.org/10.3126/ijssm.v7i1.27406>.
- Azab, W. A., Soliman, N. M., & Melika, F. F. (2021). Improving Nurses' Performance to Use Infection Control Standard Precautions in Emergency Unit. 8(1), 537–546.
- Babanyara, Y. Y., Ibrahim, D. B., Garba, T., Bogoro, A. G., & Abubakar, M. Y. (2013). Poor Medical Waste Management (MWM) Practices and Its Risks to Human Health and the Environment: A Literature Review. 11, 757–764.
- El-Enein, N. Y. A., & El Mahdy, H. M. (2011). Standard precautions: A KAP study among nurses in the dialysis unit in a University Hospital in Alexandria, Egypt. *Journal of the Egyptian Public Health Association*, 86(1–2), 3–10. <https://doi.org/10.1097/01.EPX.0000395430.92943.69>.
- Fashafsheh Ahmad Aayed, I., & Eqtaib Lubna Harazneh, F. (2015). Knowledge and Practice of Nursing Staff towards Infection Control Measures in the Palestinian Hospitals. 6(4), 79–91.
- Greeb, H. E. E.-, Ahmed, A. I., Atia, H. M., & Mouty, S. M. A.-. (2018). Assessment of Nurses' Compliance with Infection Control Standard Precautions at Outpatient Clinics of Urology and Nephrology Center - Mansur University. *Journal of Nursing and Health Science*, 7(3), 54–59. <https://doi.org/10.9790/1959-0703015459>.
- Haile T., A. A. (2017). Compliance with standard safety precautions and associated factors among health care workers in Gondar University comprehensive, specialized hospital, Southern Ethiopia. *PLoS ONE*, 15(October 10). <https://doi.org/10.1371/journal.pone.0239744>.
- IS, A., & MO, A. (2012). Knowledge, Awareness and Compliance with Standard Precautions among Health Workers in North Eastern Nigeria. *Journal of Community Medicine & Health Education*, 02(03). <https://doi.org/10.4172/jcmhe.1000131>.
- Killam, L. A., Montgomery, P., Raymond, J. M., Mossey, S., Timmermans, K. E., & Binette, J. (2017). Unsafe clinical practices as perceived by final year baccalaureate nursing students: Q methodology. *BMC Nursing*, 11. <https://doi.org/10.1186/1472-6955-11-26>.
- Krageschmidt, D. A., Kubly, A. F., Browning, M. S., Wright, A. J., Detmer, M. J., & McCoy, W. F. (2014). Reply to Shelton. *Infection Control & Hospital Epidemiology*, 35(10), 1311–1312. <https://doi.org/10.1086/678074>.
- Mohammed Ali Hassan, A., Abdel Halim Mostafa Ahmed, F., A. Hamed, L., & Mohammed Abo El-elle Mohammed, M. (2022). Web-Based Intervention Improves Surgical Units Nurses' Performance about Infection Control Precautions during Coronavirus Outbreaks. *Egyptian Journal of Health Care*, 13(1), 1626–1637. <https://doi.org/10.21608/ejhc.2022.230016>.
- NCDC; Directorate General of Health Services. (2020). National Guidelines for Infection Prevention in Health and Control in healthcare Facilities. *MoHFW, Government of India*, January, 1–264.
- Sarani, H., Balouchi, A., Masinaeinezhad, N., & Ebrahimitabas, E. (2015). Knowledge, Attitude and Practice of Nurses about Standard Precautions for Hospital-Acquired Infection in Teaching Hospitals Affiliated to Zabol University of Medical Sciences (2014). *Global Journal of Health Science*, 8(3), 193–198. <https://doi.org/10.5539/gjhs.v8n3p193>.
- Theogene Uwizeyimana, B. N., Kabakambira, J. D., Shonza, F., Jackson, Dushime, Humura, F., Niyonkuru, S., Rukundo, A., Ngenzi, V., , Simeon

- Tuyishime, Y., Ahmed Mohammed Elhadi, Emery Manirambona, Yusuff Adebayo Adebisi, Erigene Rutayisire, D. E., & Lucero-Priso1. (2021). The Multi Sectorial Approach to COVID-19 Pandemic in Limited-Resource Settings: Discussing Rwandan Experience. *Jphi*, 3(4), 14. <https://doi.org/10.14302/issn.2641>.
- Valim, M. D. (2016). Instruments and impacting factors on standard precautions knowledge among health workers/Instrumentos e fatores impactantes sobre o conhecimento das medidas de precauções-padrão entre trabalhadores de saúde/Instrumentos y factores impactantes en conocimie. *Enfermería Global*, 15(1), 305–321. <https://search.proquest.com/docview/1784042521?accountid=17242>.