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Assessment of Nurses' Practice in Comparison between Urban and Rural at Primary Health Care Centers Toward Infection Control Application

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Abstract

Background: Healthcare providers, particularly nurses, are at risk of infection as part of the COVID-19 pandemic since they assist in the disease's containment. By recognizing the risk factors for infection and implementing suitable measures to reduce these risks, all reasonable efforts should be taken to control the spread of infection to them.

Objective(s): To assess nurses' practice in comparison between urban and rural at primary health care centers toward infection control application.

Methodology: A descriptive design, which uses the evaluation approach, had been conducted at rural and urban primary health care centers in Dhi Qar Governorate in order to measure the infection control application on nurse's job performance. This study is started from (4 December 2022 to 24 April 2023).

Results: The findings reveal that the most of participants of nurses in both groups (urban & rural) have a good levels of nurses' practice regarding infection control application at primary health care centers in the study sample (n=50; 35(70%), 41(82%) respectively, with arithmetic mean and standard deviation (2.45 ± 0. 267), (2.51 ± 0. 239) respectively.

Conclusion: Concerning the nurses' practices about infection control application, the results found adequate nurses' practices toward hand washing, tactics of anti-contamination during safe injection, while inadequate nurses' practice toward (PPE).

Recommendations: Strict observation of nurses' performance/ utilization of infection control standard precautions and correction of poor practices by the infection control team are required. Providing training programs for newly joined nurses about infection control standard precautions and at regular intervals. Recommendation of nurses about (PPE) to decrease the risk of infection.

Keywords: *Nurses, Practice, Urban, Rural, Primary health care, Infection control.*

INTRODUCTION

Worldwide, viral diseases are still developing, and they are considered to constitute significant risks to the public's health. In the past 12 years, epidemics such as those caused by the Middle East respiratory syndrome coronavirus (MERS-CoV), the severe acute respiratory syndrome coronavirus (SARS-CoV), and the H1N1 influenza have developed (1, 2,3). Healthcare providers, particularly nurses, are at risk of infection as part of the COVID-19 pandemic since they assist in the disease's containment. By recognizing the risk factors for infection and implementing suitable measures to reduce these risks, all reasonable efforts should be taken to control the spread of infection to

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them (4,5,6). Today, healthcare-associated infections (HCAI) represent a significant public health issue. The consequences of HCAI include extended hospital stays, permanent disabilities, an increase in microorganism resistance to antibiotics, a significant increase in financial load, high costs for patients and their families, and an excess of deaths. Despite the fact that every hospital and healthcare system in the world faces the risk of contracting HCAI, it is difficult to determine the full extent of the problem due to the lack of accurate diagnostic data. Global estimates show that at any given time, more than 1.4 million people in both developed and developing countries are impacted (7, 8,9).

The rapid global spread of infectious diseases like the Middle East Respiratory Syndrome (MERS) coronavirus (MERS-CoV), which emerged in Saudi Arabia in 2012 and was responsible for (2494) lab, and the Severe Acute Respiratory Syndrome (SARS) coronavirus (SARS-CoV), which was first discovered in southern China specifically in Guangdong, during November 2002, has become a major public health concern.-MERS cases have been confirmed, and there have been (858) deaths that are related to those cases(10,11,12,13).

METHODOLOGY

Methodology

The Design of the Study: A descriptive design, which is using the evaluation approach, had been conducted at rural and urban primary health care centers in Dhi Qar Governorate in order to measure the infection control application on nurses' job performance. This study is started from 4 December 2022 to 24 April).

Setting of the Study: The study was conducted at rural and urban primary health care centers in. Dhi Qar Governorate.

Study Samples: A Sample of (100) Male and female nurses who worked in dressing unit and immunization unit urban primary health care centers. A Convenience sample "non-probability" sample of nurses had been selected from rural and urban primary health care centers distribution in Dhi Qar Governorate.

Method of data collection: After the agreement was obtained from all institutions. The data were collected from28 of December2022 to the 24 of April2023. The investigator conducted private meetings with the directors of (PHC) centers to confirm that nurses should not be informed by the nature of the investigation, in order to control or minimize bias in their behavioral responses relative their practices. Data were collected through the use of the constructed questionnaire as an observation tool; the investigator gathered the subjects' responses through an application of the structured observation method (direct observation) as a means of data collection. Nurses were observed while they were working in the immunization unit, dressing unit, emergency unit and communicable unit. The observation checklist took about (20-30) minutes; each of them was observed on an individual basis; and by using an Arabic version of questionnaires for all subjects who were included in the study sample, the data were collected by direct observation was performed with the nurses' practices during use standard precautions.

Data Analysis: Data were analyzed through the application of appropriate statistical methods by using statistical package of social sciences (SPSS) version 26.

RESULTS OF THE STUDY

Table (1): Assessment of nurses' practice, and comparison between urban and rural at primary health care centers toward infection control application

No	Questions	Urban group			Rural group			C.S.	
		M.S.	Std.	Eva.	M.S.	Std.	Eva.	P. value	Sig.
First: PPE (Vest, gloves, face masks)									
1.1	**Wear a Vest inside medical health center**	2.90	0.303	**G**	2.84	0.370	**G**	**0.377**	**NS**
1.2	**Wears a mask to cover your mouth and nose**	2.54	0.503	**G**	2.48	0.544	**G**	**0.568**	**NS**
1.3	**Wear gloves before any action nursing**	2.70	0.463	**G**	2.66	0.519	**G**	**0.685**	**NS**
1.4	**Use gloves once (pull blood, installation canola, suction secretions, when touching blood, body fluids, injection vaccine or drugs)**	2.52	0.544	**G**	2.48	0.646	**G**	**0.738**	**NS**
1.5	**There is an appropriate range of sizes available of gloves**	2.42	0.538	**G**	2.28	0.607	**M**	**0.225**	**NS**
1.6	**Use thick gloves when handling (waste leftovers contaminated tools, do cleaning, Dispose of waste leftovers, dealing with sharps and sharps containers)**	2.46	0.613	**G**	2.32	0.683	**M**	**0.284**	**NS**
Second: Wash your hands									
2.1	**Availability provide sinks in rooms (immunization, dressing)**	2.18	0.800	**M**	2.58	0.642	**G**	**0.376**	**NS**
2.2	**Availability provide liquid soap in the room (immunization, dressing)**	2.28	0.671	**M**	2.60	0.535	**G**	**0.010**	**S**
2.3	**Soap must be available in a dry room (immunization, dressing)**	2.42	0.575	**G**	2.28	0.607	**M**	**0.239**	**NS**
2.4	**An alcohol solution must be available in the room (immunization, dressing)**	2.38	0.635	**G**	2.54	0.706	**G**	**0.236**	**NS**
2.5	**Tissue paper Must be available in the rooms (immunization, dressing)**	2.28	0.607	**M**	2.30	0.707	**M**	**0.880**	**NS**
2.6	**Manicure and do not put it paints**	2.40	0.639	**G**	2.38	0.602	**G**	**0.872**	**NS**
2.7	**Wash your hands with ordinary soap and includes hands and fingers for 40-60 seconds**	2.32	0.587	**M**	2.34	0.626	**G**	**0.869**	**NS**
2.8	**Rub your hands with lotion rubbing alcohol includes hands and fingers until dry alcohol**	2.30	0.614	**M**	2.44	0.541	**G**	**0.229**	**NS**
2.9	**Wipe oneself after washing hands by tissue paper or towels to dry healthy and disposed of after wipe**	2.36	0.693	**G**	2.22	0.648	**M**	**0.299**	**NS**
2.10	**Wear sterile gloves after Rinse and dry your hands immediately**	2.38	0.697	**G**	2.53	0.581	**G**	**0.246**	**NS**
2.11	**Switching another sterile gloves in the case of tear or puncture gloves during operations nursing**	2.48	0.614	**G**	2.58	0.538	**G**	**0.389**	**NS**
Third: Tactics of anti-contamination during safe injection									

3.1	**Safety at the injection nurse prepares the necessary tools (such as a syringe and a new needle and a sterile, alcohol concentration 70%, pieces of cotton or gauze, medical stuck)**	2.60	0.571	**G**	2.74	0.565	**G**	**0.221**	**NS**
3.2	**Uses techniques that include glaucoma (cleanse the injection place (except the vaccine) using 70% alcohol, in a circular motion from the center to the outside, leaving the alcohol to dry)**	2.60	0.535	**G**	2.74	0.527	**G**	**0.190**	**NS**
3.3	**Remove the needle from the injection place and put cotton or gauze dry, and pressing it gently on the injection place**	2.46	0.676	**G**	2.88	0.328	**G**	**0.000**	**HS**
3.4	**Dispose of all sharps in puncture-resistant containers.**	2.58	0.642	**G**	2.74	0.527	**G**	**0.176**	**NS**
3.5	**Sharps not break, bend or cut**	2.52	0.677	**G**	2.66	0.519	**G**	**0.249**	**NS**
3.6	**Disposal of needle and syringe together and considered as one unit**	2.54	0.646	**G**	2.52	0.614	**G**	**0.874**	**NS**
3.7	**Not to re-cover the needle only when needed**	2.46	0.706	**G**	2.58	0.642	**G**	**0.376**	**NS**
Fourth: cleaning Equipment surgical tools									
4.1	**Washing Equipment and surgical tools with soap and water well**	2.32	0.819	**M**	2.42	0.642	**G**	**0.867**	**NS**
4.2	**Rub tools with especially a brush**	2.34	0.717	**G**	2.42	0.609	**G**	**0.549**	**NS**
4.3	**We are drying equipment and tools after being washed by sterile gauze**	2.44	0.705	**G**	2.44	0.644	**G**	**1.000**	**NS**
4.4	**Sterilize of tools by Heat oven**	2.48	0.614	**G**	2.88	0.328	**G**	**0.000**	**HS**
Fifth Waste Management									
5.1	**Is there a system in place for how to dispose of waste?**	2.40	0.639	**G**	2.34	0.593	**G**	**0.627**	**NS**
5.2	**Train HCW on how to collect and throw the waste, taking into account the minimum deal with hands**	2.34	0.593	**G**	2.34	0.593	**G**	**1.000**	**NS**
5.3	**HCWs wear special protective clothing**	2.50	0.614	**G**	2.54	0.542	**G**	**0.731**	**NS**
5.4	**Must give to cleaners a vaccine against infected viral hepatitis**	2.48	0.614	**G**	2.36	0.563	**G**	**0.311**	**NS**
5.5	**Put waste in plastic bags and difference in the colors of bags depending on the type of waste, such as general waste bags placed black**	2.50	0.580	**G**	2.44	0.541	**G**	**0.594**	**NS**
5.6	**Solid waste must be disposed of in red bag a special mark to send the incineration**	2.44	0.541	**G**	2.42	0.642	**G**	**0.867**	**NS**

No. = number of item , M.S.= mean of score, S.D.= Standard Deviation, Eva.= Evaluation; Evaluation levels : 1.00- 1.66) = Poor; (1.67- 2.33) = Moderate; (2.34- 3.00) = Good.

Table (1) showed that majority of items are good level of mean of score in urban group concerning assessment of nurses' practice related to infection control application at the study sample, and items (2.1, 2.2, 2.5, 2.7, 2.8, & 4.1) reveals that there is moderate level of nurses' practice evaluation. While in rural group is presented that the nurses' practice for all items regarding to infection control application for study sample were a good,

except the items (1.5, 1.6, 2.3, 2.5 & 2.9) showed moderate level of nurses' practice evaluation.

Statistically, there are non-significant differences between urban and rural groups of study sample in all items for nurses' practices related to infection control application, except the items (2.2, 3.3 & 4.4) shows that there are significant differences between nurses' practices, when analyzed by t-test.

Table (2): Overall evaluation of nurses' practice regarding infection control application for urban and rural group

Levels of evaluation	Urban group		Rural group	
	F	%	F	%
Poor : (1.00 – 1.66)	0	0.0	0	0.0
Moderate: (1.67 - 2. 33)	15	30.0	9	18.0
Good: (2. 34 - 3.00)	35	70.0	41	82.0
Total	**50**	**100.0**	**50**	**100.0**
$\bar{x} \mp$ Std. Dev.	**2.45 ± 0.267**		**2.51± 0.239**	

F= Frequencies, % = Percentages, Arithmetic Mean ($\bar{x}$) and Std. Dev.= Standard. Deviation.

This table reveals that the most of participants of nurses in both groups (urban & rural) have a good levels of nurses' practice regarding infection control application at primary health care centers in the study sample (n=50; 35(70%), 41(82%) respectively, with arithmetic mean and standard deviation (2.45 ± 0. 267), (2.51 ± 0. 239) respectively.

DISCUSSION

A general information about infection. Regarding the general information about infection, the findings in table (2). Table (1) showed that majority of items are good level of mean of score in urban group concerning evaluation of nurses' practice related to infection control application at the study sample, and items (2.1, 2.2, 2.5, 2.7, 2.8, & 4.1) reveals that there is moderate level of nurses' practice evaluation. While in rural group is presented that the nurses' practice for all items regarding to infection control application for study sample were a good, except the items (1.5, 1.6, 2.3, 2.5 & 2.9) showed moderate level of nurses' practice evaluation.

(14) This study showed that nurses in this age group were characterised by a high level of activity and attention to preventative measures, so it might have a considerable impact on the average degree of practises for this age group, with no significant correlation between gender and behaviours related to COVID-19 preventative measures when looking at participants' gender and their preventive measures.

Nurses' practices concerning PPE (gown, gloves, face masks) shows the result of nurses' practices concerning the PPE (gown, gloves, face masks) that there was good level a significantly of scores for most items in urban, while nurses' practices were good level at all items except (1.5,1.6) were moderate level. It could be concluded that the nurses' performance in workplace at primary health care centres was adequate. WHO showed that care settings and regarding the use of gowns, gloves, and face masks, where appropriate. In addition to the grade of the evidence underpinning their recommendations there is an indication of a Health and Safety (H&S) requirement both nurse and the patient from the risk of contamination and potential cross infection (COVID-19) (15).

Concerning the nurses' practices were good significance level for most items (3,4,6,9,10,11) and (1,2,5,7,8) were moderate in urban while the majority of items were good level (1,2,4,6,7,8,10,11) and (3,5,9) items were moderate in rural. This means that the nurses' performance for hand washing was adequate.

WHO has reported regarding hand washing, applies guidelines on Hand Hygiene in Health Care with ongoing actions on blood safety, injection and immunization safety, safer clinical practices, and safe water, sanitation and waste management on blood safety, injection and immunization safety, safer clinical practices, and safe water, sanitation, and waste management (16). WHO;CDC has reported regarding hand washing applies guidelines on Hand Hygiene in Health Care with ongoing actions applies guidelines on hand hygiene in health care ongoing actions on blood safety, injection, PPE gloves, face masks, cleaning equipment and immunization safety, safer clinical practices, and safe water, sanitation and waste management, guidelines for preventing transmission of infection can ensue in a broad variety of infections such as, for example, COVID-19, MERS, respiratory, blood, bone and skin infections(17).

These findings based on the researcher's point of view, the majority of items are agood level of mean of score in urban group and rural group concerning evaluation of nurses' practice related to infection control application and used PPE at the study sample, the reason for the increase in the level of practices in primary health care centres is due to the risk of exposure to communicable diseases such as Covid-19 and reason for the increase in disease transmission and the rate of mortality and morbidity globally led to a commitment in the use of personal protective equipment.

Nurses' practices concerning the tactics of anti-contamination during safe injection all items included in this table were of good level of nurses' practices concerning the tactics of anti-contamination during safe injection at rural and urban primary health care centres, this indicates adequate nurses' performance concerning the tactics of anti-contamination during safe injection. This finding agrees with (18) study, which reported that up to (48.4%) respondents had good practice of injection safety while (47.5%) of them had excellent practice.

Concerning the Preventive measures of infection, the finding in table (5) present that there are mean of scores Regarding Nurses' This table reveals that the most of participants of nurses in both groups (urban & rural) have a good levels of nurses' practice regarding infection control application at primary health care centres in the study sample (n=50; 35(70%), 41(82%) respectively, with arithmetic mean and standard deviation (2.45 ± 0. 267), (2.51 ± 0. 239) respectively.

(19,20) Which has reported the level of education was found to be one of the factors significantly and positively associated with nurses' practice in preventing health care institution-acquired infections, in which degree diploma holders. This could be due to the possibility that more educated respondents have a higher opportunity of exposure to different courses directly or indirectly related to the prevention HAIs. The study also showed nurses' length of clinical experience significantly differed significantly from HAI prevention practice scores. This might be because nurses with more years of clinical experience have more chances to work with different professionals to learn from their co-worker's experiences.

CONCLUSION

Concerning the nurses' practices about infection control application, the results found adequate nurses' practices toward hand washing, tactics of anti-contamination during safe injection, while inadequate nurses' practice toward (PPE).

RECOMMENDATIONS

Strict observation of nurses' performance/ utilization of infection control standard precautions and correction of poor practices by the infection control team are required. Providing training programs for newly joined nurses about infection control standard precautions and at regular intervals. Recommendation of nurses about (PPE) to decrease the risk of infection.

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