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RESEARCH ARTICLE

Impact of an Intervention Program on Nurses Knowledge towards Infection Control Measures in Pediatric Surgical Wards

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ABSTRACT

***Background**: Infection control has become a major concern in the health-care system, and health-care personnel, especially nurses, are particularly vulnerable to infection. The goal of this study is to see how effective an intervention program is in improving nurses' knowledge of infection prevention in pediatric surgery wards.*

***Methods**: A pretest-posttest quasi-experimental design was used in this investigation. There were 40 people in the sample. Twenty nurses from the Central Teaching Hospital of Pediatrics were in the intervention group, whereas twenty nurses from the Children Welfare Teaching Hospital were in the control group. The questionnaire's dependability was established through a pilot research, and it was subsequently presented to experts for validation. The total number of items in the knowledge section of the questionnaire was 35. The information was gathered through self-reporting and analyzed using descriptive and inferential statistical data analysis.*

***Results**: The study's findings revealed that (80%) of nurses had inadequate knowledge, while (70%) of nurses had adequate knowledge after implementing the intervention program. In the pre-test period of assessment, there is no statistically significant difference between the intervention and control groups (p>0.05). At the post-test measurement period, there is a statistically significant difference between the intervention and control groups (p0.05).*

***Conclusions**: Nurses' awareness of infection control procedures can be improved through an intervention training program. The nurses' understanding of infection control was improved following the training, according to the findings of this study. This study found that the training program is very effective, and that all nurses should be exposed to infection control training in order to provide them with the knowledge and skills they need to combat illness spread in the health-care context.*

***Key-wards**: Intervention Program, Knowledge, Nurses.*

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INTRODUCTION

The structure for the prevention of infections linked with the provision of health care services is referred to as infection control. These methods and measurements are practical (rather than academic) pathology sub-measures. As a result, it is a component of the healthcare system (although there is little knowledge of it and low support for it). As a result, rather of being focused at society as a whole, hospital infection control and epidemiology are relevant to public health practice (Storret et. al., 2017). The clinical application of microbiology in practice has been defined as infection prevention and control. Simply said, it is the umbrella word for all activities aimed at protecting individuals from infection. Most people carry out such behaviors as part of their everyday routines; for example, people wash their hands before eating to protect themselves from illness (World Health Organization [WHO], 2020). Nosocomial infections have long been recognized as an issue that degrades health-care quality and is a major cause of negative health-care outcomes. It has been demonstrated in the literature that these infections have a significant influence on patient safety. Among the many negative consequences include longer hospital stays, higher healthcare expenditures, financial difficulty for patients and their families, and even death (Khan et. al., 2015). According to epidemiological research, nosocomial illnesses can be spread from infected patient to infected patient by direct person-to-person contact. Healthcare staff, non-infected patients, and by indirect contact with infected patients via equipment, supplies, medical procedures, or the air (Khan et. al., 2017). The severity of the pathogens, their accessibility to the patient, and the patient's susceptibility to the pathogen all influence the impacted body systems. The urinary tract, surgical wounds, respiratory system, and blood stream are the most prevalent types of nosocomial infections (Sikora & Zahraa, 2021). Several epidemiological studies have found that healthcare workers like doctors, dentists, and nurses are involved in the spread of nosocomial illnesses. Transmission has also been observed to happen regularly during medical operations when these healthcare workers fail to follow aseptic precautions. As a result, healthcare personnel who do not follow established guidelines expose patients to a wide range of infections (Setia et. al., 2013; Ulger et. al., 2015). In healthcare settings, nurses, regardless of speciality, have the most direct contact with patients. In addition, there are particular examples in the literature where nurses are implicated in the transmission of nosocomial diseases (Ronak, 2016). According to a study of the literature, nursing training programs include courses and instructional methodologies targeted at preparing the nurse practitioner in infection control protocols and, as a result, the decrease and transmission of nosocomial infections (Deolaso, 2017). Several epidemiological studies have found that healthcare personnel, such as nurses, are involved in infection control efforts. There is a scarcity of literature on nurses' knowledge. As a result, it is critical to examine the role of knowledge on infection control further. The findings of this study will be added to the current literature and could be utilized to design strategies to prevent nosocomial infections from spreading.

METHOD

The before and post assessments were used in a quasi-experimental study conducted on a group of nurses in Baghdad, with Central Teaching Hospital of Pediatrics as the intervention group and Children Welfare Teaching Hospital as the control group. An objective sample of 40 nurses was used, which was divided into two groups of 20 samples each. The intervention program was tested on 20 nurses, who were compared to the control group's 20 nurses.

Validity was determined by a panel of 11 arbitrators who were asked to comment on each component of the study questionnaire in terms of language appropriateness, correlation with the dimension of study variables to which it was assigned, and suitability for the study population.

The reliability of the study instruments means making sure that the answer will be almost the same, if it is repeatedly applied to the same people, at different times. The same people the second time, after confirming the apparent validity of the study tool, the researcher applied it to a random exploratory sample of 5 nurses, using the test-retest method, where each nurses from the sample was given a number from 1 to 5 and the questionnaire was distributed to them without prior known of them that they are a sample to measure the stability of the tool, and after an interval of about two weeks, 5 questionnaires were redistributed to the same exploratory sample, where the members of this sample were later excluded from the original sample on which the final study was conducted. Reliability coefficient using the sample coefficient of Alpha Cronbach as shown below

Test=0.74

Re-test=0.79

The SPSS version 20.0 software application was used to conduct statistical analysis. The information was evenly distributed. Paired and independent sample *t test* were used to examine variations in variables intervention and control groups. For continuous variables, descriptive data is reported as mean standard deviation, and for categorical variables, it is shown as number (percent). Statistical significance was defined as a p≤0.05.

RESULTS

The mean age for nurses in the study group is 28 (±6.76), while the mean age in the control group is 30.5 (±9.02). The age 21-29 years old was reported as the highest percentage in both groups (60 percent) for each of them. There were no statistically significant differences in age groups in both groups (p=0.562). In terms of gender, female nurses dominated the study (70%) and control (55%) groups, compared to male nurses (30%) and 45 percent, respectively. In terms of gender, there were no significant differences between the two groups (p=0.186). Nurses in both the research and control groups had a diploma in nursing (50 percent and 45 percent, respectively) when it came to education. In terms of education level, there were no significant differences between the two groups (p=0.067). The majority of nurses in both the research and control groups had at least 5 years of experience in the nursing sector (57 percent and 55 percent, respectively) and in pediatric wards (85 percent). In terms of experience, there were no significant differences between the two groups (p=0.069 and 1.00). In terms of training courses, the findings show that in both the study (80%) and control (65%) groups, the majority of nurses did not attend any training sessions. In terms of training courses, there were no significant differences between the two groups (p=0.083).

Table 1. Demographic characteristics related to participants.

SDVs	Classification	Intervention		Control		*p-value*
		Freq.	%	Freq.	%	
Age/yer	21-29	12	60.0	12	60.0	*.562*
	30-39	6	30.0	3	15.0	
	40 and older	2	10.0	5	25.0	
	M± SD	*28±6.76*		*30.5±9.02*		
Gender	Male	6	30.0	9	45.0	*.186*
	Female	14	70.0	11	55.0	
Education Level	School Nursing	7	35.0	5	25.0	*.067*
	Diploma Nursing	10	50.0	9	45.0	
	Bachelors Nursing	3	15.0	6	30.0	
Years of Experience	<5 years	15	75.0	11	55.0	*.069*
	5-10 years	4	20.0	5	25.0	
	>10 years	1	5.0	4	20.0	
Experience in Pediatric Words	<5 years	17	85.0	17	85.0	*1.000*
	>5 years	3	15.0	3	15.0	
Training related ICMs	No	16	80.0	13	65.0	*.083*
	Yes	4	20.0	7	35.0	

Table 2 shows that the majority of nurses (80%) had a low level of knowledge regarding infection control methods at the pre-test, as evidenced by low mean scores. While, following the implementation of the education program, studies revealed that the majority of nurses (70%) had a high level of knowledge at the post-test, as evidenced by high mean scores.

Table (2): Nurses Knowledge about Infection Control Measures in intervention Group

Weighted	*Pre-test*			*Post-test*		
	Freq.	%	*M ± SD*	Freq.	%	*M ± SD*
Poor (35-58)	16	80.0	*52.6 ± 15.04*	1	5.0	*84.8± 15.68*
Fair (59-81)	2	10.0		5	25.0	
Good (82-105)	2	10.0		14	70.0	

Total	20	100.0		20	100.0	

M: Mean of total Scores, SD: Standard Deviation for total scores

Table 3 shows that the majority of nurses (80%) had a low level of knowledge regarding infection control methods at the pre-test, as evidenced by low mean scores. After a length of time had elapsed, studies revealed that the majority of nurses (70%) had a low level of knowledge at the post-test, as evidenced by low mean scores.

Table (3): Nurses Knowledge about Infection Control Measures in Control Group

Weighted	*Pre-test*			*Post-test*		
	Freq.	%	*M ± SD*	Freq.	%	*M ± SD*
Poor (35-58)	16	80.0	*51.2 ± 16.54*	14	70.0	*54.4± 19.32*
Fair (59-81)	3	15.0		4	20.0	
Good (82-105)	1	5.0		2	10.0	
Total	20	100.0		20	100.0	

M: Mean of total Scores, SD: Standard Deviation for total scores

Table (4) shows that in the pre-test period of assessment, there is no statistically significant difference between the intervention and control groups (p=0.789). At the post-test measurement period, there is a statistically significant difference between the intervention and control groups (p=0.000).

Table (4): Difference between the Intervention and Control Group responses at pre-post test

Periods	Groups	Mean	SD	t-value	d.f	*p-value*
Pre-test Knowledge	Intervention	1.50	.429	.270	38	*0.789*
	Control	1.46	.472			
Post-test Knowledge	Intervention	2.42	.448	5.462	38	*0.000*
	Control	1.55	.552			

DISCUSSION

Using Liker's questionnaire items approach for knowledge and practices, which were categorize in to three categories responses, along studied (Pre and Post) periods owing to implementation of an intervention program for study group, as well as controls group are chosen for meaningful comparisons.

The results of significant testing with reference to questionnaire items are mostly significant differences at p-value 0.05, indicating that the studied interventional program was effective in raising knowledge and practices in the study group, and that it was able to confirm the importance or success of implementing the suggested program. When there are no significant differences at p-value >0.05 and the suggested program cannot be used, vice versa.

Nurses Knowledge towards Infection Control Measures at Pre-Test for both Groups (Intervention and Control)

A total of 35 questions were used to measure the knowledge of respondents regarding The mean score for infection control measures was 82-105 for a higher level, 59-81 for a moderate level, and 35-58 for a lower level. Nurses in both the intervention group 52.6 (±15.04) and the control group 51.2 (±16.54) had low understanding of infection control measures at the pre-test period of measurement, according to the current study findings. Infection control in pediatric surgery wards is a concern, according to this report.

In the pre-test period of measurement (t=0.270; p=0.789), there was no statistically significant difference in nurses' knowledge of infection control methods between the intervention 1.50 (±0.429) and control 1.46 (±0.472) groups. In terms of the statistical mean, the study findings show that the nurses in the intervention group have weak knowledge to the same extent as the nurses in the control group, implying an assessment of 40 nurses with inadequate knowledge.

Our findings are consistent with findings from Pediatric Teaching Hospitals in Baghdad City, which show that nurses had limited awareness of how to recap used needles and how to wear a surgical mask for more than 3 feet to minimize droplet transmission. The study suggests that nurses should adapt and reinforce their knowledge of universal precautions through ongoing teaching programs, as well as increase their awareness (Shouq et. al., 2014).

Knowledge was found to be lower than in Northern Nigeria (Abdulrahman et. al., 2012), the Federal Medical Centre, and Asaba (Isar & Otfili, 2010), but greater than in other research (Johunson et. al., 2015) (Vas et. al., 2015). This could be attributed to pediatric hospitals' lack of infection control training courses.

In Palestinian pediatric facilities, there is a lack of information regarding infection management.

It is advised that nurses update their knowledge and practice through continuing in-service educational sessions, emphasizing the significance of adopting the most up-to-date evidence-based infection control procedures (Ayed, 2015).

In another study, it was discovered that pediatric hospitals have insufficient knowledge of infection control due to a lack of periodic training, and that hospitals policies should be updated by enrolling nurses in training programs and relying on academic nurses with more years of expertise (Shaalan, 2018).

The lack of knowledge about infection control measures in both the study and control groups could be due to a variety of factors, including a lack of training, a low education level, the nurses' failure to develop and update their knowledge on a regular basis, the majority of nurses working in health institutions have stopped reading books, so they do not follow up and only engage in nursing practices, and as a result, they have become unable to recall some information, particularly knowledge about infection control measures.

Nurses Knowledge towards Infection Control at Post-Test for both Groups (Intervention and Control)

At the post-test period of assessment 84.8 (±15.68) following implementation of the intervention program, nurses expressed a high degree of awareness about infection control measures, according to the current study findings. While the nurses in the control group had a low level of knowledge 54.4 (±19.32) when it came to infection control measures, their knowledge did not change over time. This finding indicates that an intervention program is effective, as nurses in the intervention group reported a benefit.

In terms of understanding of infection control measures, there was a statistically significant difference in knowledge scores between the intervention 2.42 (±0.448) and control 1.55 (±0.552) groups during the post-test measurement period (t-test= 5.462; p=0.000). In terms of the statistical mean, the study findings show that the intervention group's knowledge scores improved after the intervention program was implemented compared to the control group.

According to the hypothesis (There were substantial variations in nurses' knowledge between the intervention and control groups), nurses in the intervention group benefited significantly from the intervention program in terms of infection control measures. In this regard, 70% of nurses expressed an interest in expanding their knowledge. As a result, it was proved that a significant number of nurses will attend and benefit from training programs tailored specifically for them. However, research is needed to determine the success rate of these programs and their impact on pediatric hospital knowledge (El-shafey et. al., 2019).

This finding is consistent with (Galal et al., 2018), who reported that the post intervention phase exhibited a higher level of knowledge than the pre intervention phase. In addition, the post intervention phase indicated greater total knowledge and practice scores than the before intervention phase. In a similar vein Mohamed et. al. (2018), investigated the effectiveness of educational programs to improve healthcare workers' knowledge and compliance with standard precautions when measuring knowledge levels of occupational exposures and universal precautions. They discovered that after receiving the intervention, participants had a higher level of knowledge.

Furthermore, numerous similar and related studies in Zambia have found that 74.4 percent (Mukawato et. al., 2008) and 84.5 percent (Guliat & Tiruneh, 2008) of people in Bahirdar city. Furthermore, our findings are superior to those of studies conducted in Nigeria (65%) (Temesgan & Demissie, 2014), Nepal (22%) (Timilshina et. al., 2011), and Iran (57%) (Saraniet et. al., 2016), owing to the benefit of triaging and knowledge score differences.

CONCLUSIONS

Nurses' awareness of infection control procedures can be improved through an intervention training program. The nurses' knowledge and practice of infection control were improved following the training, according to the findings of this study. This study found that the training program is very effective, and that all nurses should be exposed to infection control training in order to provide them with the knowledge and skills they need to combat illness spread in the health-care context. Health-care executives should recognize the need of enacting rules that improve the working conditions of nurses and providing the required training to guarantee that infection control measures are followed. In the two teaching hospitals, a comparable study should be undertaken on other categories of health personnel.

ETHICAL CONSIDERATIONS COMPLIANCE WITH ETHICAL GUIDELINES

Ehical approval is received from the ethical committee in the college of nursing university of Baghdad.

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