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ORIGINAL ARTICLE

Effective of an Intervention Program on Nurses Practices Concerning Infection Control Measures in Pediatric Surgical Wards

ALI NEAMAH MOUSA[1], AFIFA RADHA AZIZ[2]
[1]*Academic Nurse, College of Nursing, Baghdad University, Baghdad, Iraq*
[2]*Assist. Prof, College of Nursing, Baghdad University, Baghdad, Iraq*
Correspondence to: Ali Neamah Mousa, Email: aliallzainy487@gmail.com

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 changing nurses' practices in pediatric surgery wards when it comes to infection management.

Methods: This study used a quasi-experimental design for the pre- and post-test. The sample consisted of 40 persons. The intervention group included twenty nurses from the primary pediatric teaching hospital, while the control group included twenty nurses from the pediatric care teaching hospital. The questionnaire's dependability was proven through empirical study, and it was then submitted to specialists for validation. The total number of items in the questionnaire was 49. Self-reports were used to collect data, which was then evaluated using descriptive and inferential statistical data analysis.

Results: According to the findings, 70% of nurses had insufficient practices before implementing the intervention program, while 60% of nurses had adequate practices after implementing the 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: In order to improve nurses' infection control practices, an interventional training program is essential. The findings of this study revealed that after receiving training, nurses' infection control practices improved. This study found that the training program is highly successful, and that all nurses should receive infection control training to gain the information and skills necessary to prevent infection in a hospital context. Health-care executives should recognize the importance of establishing rules to improve nurse working conditions and offer the required training to guarantee infection-control strategies are implemented.

Keywords: Intervention Program, Practices, Nurses.

INTRODUCTION

As medical care in pediatric wards has become more complex and patients have become more complicated, health-care-associated infections (HAIs) have become more common. HAIs are linked to a high rate of morbidity, mortality, and financial costs. The creation of hospital epidemiology and infection control programs was prompted by rising HAI incidence and evidence that active surveillance and infection control procedures help prevent HAIs [1]. As rates of antibiotic resistance rise and HAIs result in increased patient risks and rising health-care costs, infection control programs' importance has grown and continues to grow. The history of hospital epidemiology and infection control, common HAIs and the bacteria that cause them, and the form and role of a hospital epidemiology and infection control program are all covered in this overview [2]. Nurses working in pediatric rooms should be trained to avoid cross infection and transmission of nosocomial infections by practicing aseptic technique and demonstrating sound knowledge and practices in maintaining a sterile field at all times to prevent potential pathogens from spreading to other sites [3]. Infection control in paediatric hospitals is especially critical, and it must take into account the unique demands and environment of paediatric patients. Infections that formerly protected older patients through vaccination or natural exposure are now more vulnerable in children. As a result, the hospital pathogens and infection sites most typically linked with pediatric healthcare differ from those in adults [4]. The most common locations of healthcare-associated infection in a Latin American higher education hospital were primary bloodstream infection (BSI), pneumonia, and urinary tract infection (UTI), accounting for 31%, 20%, and 20% of all cases, respectively. In the PICU and general wards, BSI was the most common site of infection, while pneumonia was the most common in the intermediate care unit. Pneumonia was the third most prevalent infection in the pediatric intensive care unit. Skin and vascular infections, as well as peritonitis and diarrhea, are among the most common HAI sites (pediatric surgical wards, 66 percent of cases) [5]. Despite advancements in infection control practices such as improved infection prevention room ventilation, sterilization methods, barriers, surgical techniques, and antimicrobial prophylaxis availability, infection control remains a major cause of morbidity and mortality among hospitalized children [6]. In children's hospitals, nurses must follow infection control and sterilizing techniques [7]. Pediatric ward nurses are in charge of medicine, dressing, sterilization, and disinfection. They interact with patients more frequently than other health-care employees (HCWs). As a result, they are more vulnerable to infections [8]. As a result, pathogens play a critical role in pathogen transmission, and their adherence to infection control measures appears to be critical for infection prevention and control [9]. As a result, they should understand how to avoid the spread of non-communicable diseases and the risks they pose to patients, other employees, and visitors [10]. Although many prior cross-sectional studies have demonstrated that nurses' knowledge and practice levels are relatively weak and inadequate [11], no study has been undertaken in Iraq, which is the context of the current study, to the researcher's knowledge. As a result, the goal of this research was to undertake educational training on infection control techniques in order to improve nurses' understanding and behaviors in pediatric wards. In Iraq, the infection rate remains high, and the severity of infections varies each institution, based on the number of patients and procedures performed. Children's Central Teaching Hospital, for example, has a 66 percent incidence rate. Furthermore, in Al-Kadhimiya Children's Hospital, 60-80 percent of all pediatric patients are affected. Despite the fact that the pediatric room nurse plays a significant role in preventing and controlling infections in hospitalized children, infections are common in this region. As a result, one of the goals of this study is to evaluate and train nurses' infection control practices in a pediatric hospital in Bagdad, Iraq.

MATERIAL AND METHODS

In Baghdad, a group of nurses participated in a quasi-experimental investigation. It was approved by the before and post evaluations at the Central Pediatric Teaching Hospital for the intervention group and the Pediatric Teaching Hospital for 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 a control group of 20 nurses.

A committee of 11 arbitrators was given the authority, and they were asked to submit their opinions and suggestions on each component of the study questionnaire in terms of the appropriateness of the language, relevance to the dimensions of the study variables to which they were assigned, and suitability to 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=0.72

Re-test=0.83

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: Sample Characteristics

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 at the pre-test, 70% of nurses had insufficient infection control practices, as evidenced by poor mean scores on infection control measures. While, following the implementation of the education program, studies revealed that (60%) of nurses had sufficient practices at the post-test, as evidenced by high mean scores.

Table 2: Nurses Practices about Infection Control Measures in intervention Group

Weighted	Pre-test			Post-test		
	Freq.	%	M ± SD	Freq.	%	M ± SD
Inadequate (49-81)	14	70.0	74.3 ± 20.87	2	10.0	115.3± 22.15
Moderate (82-114)	5	25.0		6	30.0	
Adequate (115-147)	1	5.0		12	60.0	
Total	20	100.0		20	100.0	

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

Table 3 shows that at the pre-test, the majority of nurses (65%) had insufficient infection control practices, as evidenced by poor mean scores on infection control measures. While results showed the same scores of practices at the post-test as evidenced by low mean scores after a period of time had gone.

Table 3: Nurses Practices about Infection Control Measures in Control Group

Weighted	Pre-test			Post-test		
	Freq.	%	M ± SD	Freq.	%	M ± SD
Inadequate (49-81)	13	65.0	77.9 ± 26.45	13	65.0	80.6± 28.94
Moderate (82-114)	5	25.0		3	15.0	
Adequate (115-147)	2	10.0		4	20.0	
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 study and control groups (p=0.637). At the post-test measuring period, there is a statistically significant difference between the study 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 Practices	Intervention	1.51	.425	.475	38	.637
	Control	1.59	.540			
Post-test Practices	Intervention	2.31	.452	4.001	38	.000
	Control	1.64	.591			

DISCUSSION

Due to the application of an intervention program for the study group, as well as the control group being selected for significant comparisons, nurses exercise questionnaire items toward infection control measures, using the Liker Questionnaire items technique for knowledge and practices that are categorized into three-category answers, along the studied periods (before and after).

Significant test results were reported with reference to the questionnaire items, with the majority of statistically significant differences at p value 0.05, determining the effectiveness of the studied intervention program by increasing the study group's knowledge and practices, and confirming the importance or success of the proposed program application. When there are no significant differences at p value > 0.05, the proposed program cannot be used, and vice versa.

Nurses Practices towards Infection Control Measures at Pre-Test for both Groups (Intervention and Control): A total of 49 questions were used to assess respondents' practices regarding infection control measures, with a mean score of 115-147 indicating a higher level, 82-114 indicating a moderate level, and 49-81 indicating a lower level. In the current study, nurses in both the intervention group 74.3 (±20.84) and the control group 77.9 (±26.45) expressed insufficient infection control measures during the pre-test period of measurement. These findings support the need for nurse education programs.

In terms of infection control measures, there was no statistically significant difference in nurse practices between the intervention 1.51 (±0.425) and control 1.59 (±0.540) groups in the pre-test period of measurement (t=0.475; p=0.637). In terms of the statistical mean, the study findings show that the nurses in the intervention group had insufficient practices to the same extent as the nurses in the control group, implying an evaluation of 40 nurses with insufficient practices. An efficient of infection control program which indeed enable to develop nurses behaviors concerning infection control and patients safety from hospital acquired infection [10][12].

This study backs up findings from Mizan Aman General Hospital in southeastern Ethiopia, which indicated that the majority of nurses are undertrained due to a lack of standardized precautions with routine services [13]. Our findings were lower than those at Old Mutare Hospital, which revealed that because the majority of the nurses had a bachelor's degree, they had strong infection control measures [14]. On the other hand, our findings are greater than those of a prior study conducted in the North Wollo zone, which found 73.8 percent of practices to be unsatisfactory [15].

Because of insufficient practices, it is necessary to keep nurses' knowledge and practices up to date by encouraging and motivating them to attend special training programs and conferences on infection control measures, as well as expanding the work of the Continuing Nursing Education Unit to provide educational courses for nursing staff on infection control measures [16].

Nurses Practices towards Infection Control at Post-Test for both Groups (Intervention and Control): At the post-test period of measurement 115.3 (±22.15) following application of the intervention program, nurses indicated satisfactory practices with regard to infection control measures, according to the current study findings. While nurses in the control group had insufficient infection control procedures 80.6 (±28.94), they did not change their practices after a period of time had elapsed. This finding indicates that an intervention program is effective, as nurses in the intervention group reported a benefit.

At the post-test period of measurement, there was a statistically significant difference in practices scores between the intervention 2.31 (±0.452) and control 1.64 (±0.591) groups in terms of practices addressing infection control measures (t-test= 4.001; p=0.000). In terms of the statistical mean, the study findings show that after implementing the intervention program, the practices scores of the intervention group improved as compared to the control group.

There is a widely accepted hypothesis that states (There were substantial variations in nurse practices between the intervention and control groups), and that nurses in the intervention group benefited much from the intervention program in terms of infection control. In this aspect, 60 percent of nurses said they were willing to improve their methods. As a result, it was proved that a significant number of nurses will attend and benefit from training programs tailored specifically for them.

As a result, the null hypothesis is rejected in favor of the alternative hypothesis, and the researcher concludes that the mean infection control practice score differs significantly between the intervention and control groups.

This outcome is consistent with studies from Sudan, which show that the training program is helpful in boosting nurse midwives' use of conventional precautions in pediatric hospitals. The mean score for using standard precautions was 40.9 percent before the training, but it increased to 52.2 percent after the training [17]. According to findings from Olabisi Onabanjo University Teaching Hospital in Sagamu, Nigeria, there was a significant difference between the experimental and control groups' mean practices scores [18]. In addition, the findings back up a recent study by Temesgen and Demissie [19], which found that participants who got in-service infection control training had better practice and knowledge than those who were not.

CONCLUSIONS

Infection control practices among nurses can be improved with the use of an intervention training program. The results of this study revealed that following the training, nurses' infection control practices improved. 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.

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