

Effectiveness of an Educational Program on the Nurses' Knowledge about Medication Errors for Children with Cardiac Disorders

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ABSTRACT

The study conducted to determine the effectiveness of the education program on nurses' knowledge about medication errors for children with cardiac disorders. A total number of nurses participating in the study program was (50) nurses. The sample had been taken in one study group only. The researchers used non-probability sampling (convenience sampling). Participants in the study are selected via a process known as randomly selected for nurse from all departments for Nasiriyah Heart Center. Knowledge questionnaire was to assess Knowledge of nurses about prevention of Medication Errors for Children with Cardiac Disorders. It consists of (26) multiple-choice questions. Statistical data analysis was done by using IBM SPSS version 25.0. A p value of less than 0.05 was considered statistically significant. The nurses' knowledge of medication errors in control group were unacceptable in pre (. 39) and post (. 33) while in study group unacceptable in pre (. 38), good in post one (. 79) and moderate in post two (. 69). So that this results showed there were highly significant statistical differences between control and study groups in posttest at $p < 0.001$. nurse's knowledge regarding medication errors for children with cardiac disorders was low in both groups in the pre-test of the program when applied education program the knowledge of the study group was improved in post-test one and post-test two which means the education program was effective to improve nurse's knowledge regarding medication errors.

Key words: Knowledge, Nurse, Medication Errors, Children, Cardiac Disorders

Introduction

Medication errors (MEs) are any preventable event that may lead to an inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer". Such events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use [1].

medication administration error occurs in 5 to 20 % of all drug administrations, at least 1.5 million about 4000,000 patients suffering from preventable adverse event per year The errors involved of 42 % dose omissions or 50 % wrong time administration [2].

Nurses play an important role in promoting neonate safety, because they are predominantly provide health care and administer medications. So, they must ensure that neonate receive the right medication, right dose, right route, right time and right evaluation for therapeutic and possible adverse events [3].

Materials and Methods

Sources of data

In Dhi Qar Governorate, in Nasiriyah Heart Center, to evaluate the Effectiveness of an Educational Program on Nurses 'Knowledge about Medication Errors for Children with Cardiac Disorders.

Study design: A pre-experimental design (one group pretest-posttest design) has been carried out.

Study sample size: 50

Study duration: The period of the study started from (7th December 2022 to 22th February 2023).

Place of sample collection: In Dhi Qar Governorate, in Nasiriyah Heart Center.

Methodology: the researcher has constructed the study instruments based on the review of the relevant literature and previous study. The study instrument consists of three parts which include; Socio-demographic characteristics of the nurses who participate in the present study consist of (age, gender, educational level, marital status, and years of experiences. This part was constructed to assess Knowledge of nurses about

prevention of Medication Errors for Children with Cardiac Disorders. It consists of (26) multiple-choice questions. The study instrument's reliability was examined using the Cronbach's alpha approach and “the Statistical Package for Social Science Program (SPSS)

version 22.0. It was determined by assessing (5) nurse in Al Nasiriyah Heart Center using a test-and-retest procedure”. The reliability result shows that Cronbach's Alpha was ($r = [0.89]$) about Knowledge questionnaire about Medication Error.

Results

Table 1

Distribution of the Participants Including Study and Control Groups According to Demographic Characteristics

Demographic Characteristics	Variables	Control Group (n=25)			Study Group (n=25)	P. value	
		f	%	f.		%	
Age	< 25 years	7	28.0	6	24.0	.587 N.S	
	25- Less than 30 years	11	44.0	13	52.0		
	30- Less than 35 years	4	16.0	5	20.0		
	35 years or more	3	12.0	1	4.0		
	Total	25	100.0	25	100.0		
	Mean \pm SD Min - Max		27.80 \pm 4.592 23 – 41 years		27.20 \pm 3.109 23 – 35 years		
Gender	Male	11	44.0	4	16.0	.050 N.S	
	Female	14	56.0	21	84.0		
	Total	25	100.0	25	100.0		
Marital status	Single	14	56.0	12	48.0	.203 N.S	
	Married	11	44.0	11	44.0		
	Widow	0	0	1	4.0		
	Divorce	0	0	1	4.0		
	Total	25	100.0	25	100.0		

Education level	Institute	1 4	56.0	8	32.0	.110 N.S
	College	1 1	44.0	17	68.0	
	High certificate	0	0	0	0	
	Total	2 5	100.0	25	100.0	
Years of experience in heart unit	1 – Less than 6 years	1 8	72.0	19	76.0	.793 N.S
	6 -11 years	6	24.0	5	20.0	
	11 years or more	1	4.0	1	4.0	
	Total	2 5	100.0	25	100.0	
	Mean ± SD Min - Max		4.20 ± 3.500 1 – 14 years		4.44 ± 2.917 1 – 13 years	

f.: Frequency, No.: Number, %Percentage, M = Mean of score, S.D=Standard Deviation, Min, minimum, Max= maximum and N.S = Non significant at $p > 0.05$.

in table 1 showed that the age of the participants ($n= 50$ for two groups) was at most from 25- less than 30 years old (44% in control group and 52% in study group) as accounted for study and control group respectively with mean 27.80 years control group and 27.20 years in study group. According to gender, the female was a more than male in the two groups (56% in control and 84% in study groups respectively). Regarding the educational level in control group at most (56%) have institute certificate in nursing while in study group at most (68%) have college

certificate in nursing. The results also showed the most of participants were singles (56% in control and 48% in study group). Regarding the years of experience in heart unit of the participants at most from 1 – less than 6 years (72% in control group and 76% in study group) as accounted for study and control group respectively with mean 4.20 years control group and 4.44 years in study group. Based on the analyzed result there is no statistically significant difference with demographics two groups ($p > 0.05$).

Table 2

Comparison for nurse's knowledge about medication errors between control and study groups

Domains		Control group		Study group		Statistical analysis		
		M	SD	M	SD	t-test	df	p. value
Dimension 1/ nurses' knowledge of medication errors	Pre	.39	.100	.38	.083	.279	24	.783
	Post	.33	.112	.79	.111	-16.543-	24	.000
	Post2			.69	.175			
Dimension 2/ Nurses' knowledge toward cardiac drugs	Pre	.25	.157	.30	.094	-1.273-	24	.215
	Post	.20	.163	.77	.137	-12.611-	24	.000
	Post2			.71	.164			
Overall knowledge nurses'	Pre	.32	.098	.34	.072	-.925-	24	.364
	Post	.27	.098	.78	.098	-18.185-	24	.000
	Post2			.70	.148			

M = mean of score, S.D=Standard Deviation, d.f=degree freedom, Sig. = Significance, N.S =Non Significant at $p > 0.05$, S= Significant at $p < 0.05$, H.S: High Significant at $p < 0.001$.

Table 2 the results showed there were highly significant statistical differences between control and study groups in posttest at $p < 0.001$.

Table 3

Comparison for nurse's knowledge about medication errors between pre and post in control and study groups

Domains		Pre		Post		Post2		Statistical analysis		
		M	SD	M	SD	M	SD	t-test	df	p. value
Overall nurses' knowledge	Control	.32	.098	.27	.098			2.801	2 4	.051
	Study	.34	.072	.78	.098			-20.440-	2 4	.000
	Study	.34	.072			.70	.148	-11.149-	2 4	.000
	Study			.78	.098	.70	.148	2.365	2 4	.026

M = mean of score, S.D=Standard Deviation, d.f=degree freedom, Sig. = Significance, N.S =Non Significant at $p > 0.05$, S= Significant at $p < 0.05$, H.S: High Significant at $p < 0.001$.

Table 3 the results showed there were highly significant statistical differences between pre with first post and second posttest in study group at $p < 0.001$.

Table 4

The differences between Pre, first and second post - test for the study and control groups by total mean score and evaluation level

Group	Pre → first Post→ second post	The change in the level	The differences
Control	.32 → .27	Unacceptable → Unacceptable	.05 (↓)
Study	.34 → .78 → .70	Unacceptable → Good → Moderate	.44 (↑) → .08 (↓)

Eva=evaluation level, P = poor (0 – 0.25), UN= Unacceptable (0.26 – 0.50), M= Moderate (0.51- 0.75), G = Good (0.76 - 1).

Table 4 showed that the differences between Pre, first and second post - test for study and control groups that showed there is a good development with the evaluation level from unacceptable in the pre-test to a good level in first posttest in the study group

Table 5 Association between nurses demographics with their Knowledge toward medication errors for children with heart disorders in study group first and second post - test

Demographic Characteristics	Variables	First Post - Test				Second Post - Test			
		Mean	SD	Analysis	p. value	Mean	SD	Analysis	p. value
Age	< 25 years	.71	.153	Cc = .192	.270	.70	.147	Cc = .130	.537
	25- Less than 30 years	.68	.177			.69	.153		
	30- Less than 35 years	.64	.215			.68	.173		
	35 years or more	.89	.			.83	.		
Gender	Male	.68	.185	t = -.302-	.766	.69	.160	t = .017	.800
	Female	.70	.173			.70	.144		
Marital status	Single	.67	.181	F = .889	.463	.69	.159	F = .559	.648
	Married	.73	.171			.72	.145		
	Widow	.67	.			.75	.		
	Divorce	.44	.			.52	.		
Education level	Institute	.58	.178	F = .154	.048	.60	.149	F= .142	.041
	College	.80	.178			.79	.153		
	High certificate		
Years of experience in heart unit	1 – Less than 6 years	.67	.174	Cc = .108	.606	.68	.150	Cc =.332	.105
	6 -11 years	.73	.183			.75	.146		
	11 years or more	.89	.			.83	.		

P=probability value, NS: Non-Significant at P > 0.05, S: Significant at P < 0.05, HS: Highly Significant at P < 0.01.

In table 5 the results showed there were significant statistical differences between nurses level of education with their Knowledge toward medication errors for children with heart disorders in study group first and second post - test at P < 0.05. The results also showed there was no significant statistical correlation between nurses' age and years of experience with their Knowledge toward medication errors for children with heart disorders in study group first and second post - test at P > 0.05. Also the results showed there were no significant statistical differences between nurses' gender and marital status with their Knowledge toward medication errors for children with heart disorders in study group first and second post - test at P > 0.05.

Discussion

The results in table 1 showed that the age of the participants (n= 50 for two groups) was at most from 25-29 years old (44% in control group and 52% in study group) as accounted for study and control group respectively with mean 27.80 years control group and 27.20 years in study group. The results of the present study reported that the distribution of the gender variable is no different between the two groups, as it is high of female in both group. This finding similar the study conducted by [4, 5, 6].

In terms of educational attainment, the control group had a maximum (56%) institute certificate in nursing while the study group had a maximum (68%) college certificate in nursing. participants had experience in the heart unit for a maximum of 1 to 5 years (72% in the control group

and 76% in the study group), with a mean of 4.20 years in the control group and 4.44 years in the study group. This finding similar the study conducted by [18] [10] [5]. This result disagrees with the study by [7, 8].

The result in table (2,3, and 4) showed evaluation the nurses' knowledge toward cardiac drugs (overall) in control group were unacceptable in pre (.32) and post (.27) while in study group unacceptable in pre (.34), good in post one (.78) and moderate in post two (.70) and this finding were supported by study conducted by previous study also was find study show that a low level of knowledge concerning medication administration errors at critical care unit [9, 10, 11].

Regarding post education program for study group the knowledge of the nurse regarding medication error raise pre (.34), to good in post one (.78) and moderate in post two (.70) and this finding supported by previous study were did study to assess nurses' knowledge regarding medication error they find that education is a fundamental part of nurses' career and since the acknowledgement of the contributing factors to medication errors has been attained in a several degrees, it is authoritative to implement respective .

Educational strategies to hinder errors' arrival or increase their appropriate management [12, 13, 14].

Another study also shows after the intervention the posttest one significant improvement in the intervention group and there is no improvement regarding control group [15, 16, 17,18].

Conclusion

Although nurse's knowledge regarding medication errors for children with cardiac disorders was low in both groups in the pre-test of the program when applied education program the knowledge of the study group was improved in post-test one and post-test two which means the education program was effective to improve nurse's knowledge regarding medication errors. Also, the study found significant statistical differences between nurses' level of education with their Knowledge of medication errors for children with heart disorders in the study group's first and second post-test and was no significant statistical correlation between nurses' age and years of experience with their Knowledge toward medication errors for children with heart disorders in study group first and second post-test.

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