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Effectiveness of educational program on nurses knowledge regarding neonatal pain management

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Abstract--Neonatal period is a period from birth to first twenty eight days of human life, pain management in newborns prevent short and long term problems that affect newborns suffering from untreated pain, there are two methods for newborns pain management pharmacological and non-pharmacological method, the combination of non-pharmacological approach with other is more effective than single approach. Method: A quiz-experimental study design was carried out in the Kerbela teaching hospital for children at Holy Karbala City between the periods from 15th of October 2021 to 16th of May 2022. A non-probability (purposive) sample of (50) nurses classified into two groups (25) nurses study group and (25) nurses control group were selected based on the study criteria. The study instrument consists of (11) items of Nurses knowledge related to characteristics of neonatal pain nurses' knowledge, (11) items of Nurses knowledge related to neonatal pain assessment and (13) items of Nurses knowledge related to neonatal pain management self-reported questionnaire was used. The data were analyzed by using the program of Statistical Package of Social Sciences (SPSS) Version 22. Both descriptive and inferential statistical analysis approaches were used in order to analyze the results of the study. Results: The results of the study indicated that there were high statistical differences between the periods before and after applying of the educational program related to neonatal pain management. The study found there were no statistical significant relationship between the effectiveness of the educational program and nurses' age, gender, educational level, years of experience and having neonatal pain management training course. Conclusion: The study concluded, that a clear improvement of the knowledge of nurses regarding how to manage newborns pain after applying the educational program. Recommendations: The study

recommended the necessity of applying the current program on a large sample of health care providers in health institutions because of its great importance to shortening time, effort and positive improvement of participant knowledge and the study recommended of applying continuous educational program regarding neonatal pain management.

Keywords---Educational Program, Nurses Knowledge, neonatal pain management.

Introduction

Neonates is a period from birth to first twenty eight days of human life, its critical period because of they may suffering from complication like hyperbilirubinemia and respiratory distress syndrome (wilson, 2019). Pain always is a bad experience and an emotive. Despite, that an individual are incapable to converse pain with speaking they real or possible tissue damage lead them to suffering from pain that involve indisputably sensation in a part of the body (Aydede, 2017). There are many causes of neonatal pain, including procedural pain that occurring as a result of Sick infants or premature required medical care are suffering from approximately fourteen painful procedures daily in the hospital that's leads to frequent and often severe pain experience for these newborns (Bucsea and Riddell, 2019).

Stressful environment and a high number of painful procedures while in the hospital leads to Short- and long-term complications if pain is not adequately treated. Despite evidence of neonatal pain and available guidelines, procedural pain continues to be undertreated. This gap between research and practice is primarily due to a lack of evidence-based knowledge implementation and time constraints (Balice, et al., 2020). Effective pain management in neonates is required to reduce acute physiological and behavioral distress and may also improve acute and long-term outcomes. In neonates, painful stimuli activate nociceptive pathways from the periphery to the cortex, and behavioral responses serve as the foundation for validated pain assessment tools. However, there is growing recognition of the importance of not only reducing acute behavioral responses to pain in neonates, but also protecting the developing nervous system from persistent sensitization of pain pathways and the potentially harmful effects of altered neural activity on central nervous system development (Walker, 2014). Because many non-pharmacologic methods for managing newborns' procedural pain were not considered pain-relieving strategies, it is critical to increase parental and nurse knowledge about the effectiveness of these interventions (Pölkki, 2018). Training, the use of appropriate and accurate pain tools, and clear and research-based protocols all significantly correlated with nurses' perceptions of well-managed pain (cong, 2013). Nurses knowledge are deficit about neonatal pain management. A gap lies between their attitude and practice. So educational programs are needed to develop assess and manage pain in the newborns (Muteteli, et al., 2019).

Method

A quasi-experimental study conducted on a group of nurses in Kerbela teaching hospital for children, using the pre and post assessment. Using an objective sample of 50 nurses divided into two groups of 25 samples for each them. The educational program was conducted on 25 nurses and they were compared to the control group.

Validity was given to a panel of 11 expert were offer their opinions and suggestions on each of the study questionnaire's components in terms of language appropriateness, association with the dimension of study variables to which it was assigned, and suitability for the study population. To assess the questionnaire's reliability, data were collected from nurses, and the test was administered to 5 subjects from the study population who were not part of the original sample. Cronbach's alpha was discovered to be 0.82.

The SPSS version 20.0 software application was used to conduct statistical analysis. The information was evenly distributed. Analysis of variance (ANOVA) and independent sample t test were used to examine variations in variables based on demographic characteristics. Descriptive data is reported as mean standard deviation, and for categorical variables, it is shown as number (percent). Statistical significance was defined as a $p < 0.05$.

Result

Table 1
Descriptive Statistic of Socio-Demographic Variables (SDVs) of the Study-Control Groups

Age /years	Classification	Study		Control		<i>p-value</i>
		Freq.	%	Freq.	%	
	20-29 years old	18	72.0	17	68.0	0.618
	30-39 years old	3	12.0	3	12.0	
	40-49 years old	4	16.0	4	16.0	
	50 and older	0	0.0	1	4.0	
	<i>Mean± SD</i>	27.44 ± 7.492		30.08 ± 8.592		
Gender	Male	2	8.0	4	16.0	0.394
	Female	23	92.0	21	84.0	
Education level	School Nursing	21	84.0	20	80.0	0.738
	Diploma in Nursing	3	12.0	4	16.0	
	Bachelor in Nursing	1	4.0	1	4.0	
Years of experience	<5 years	17	68.0	14	56.0	0.705
	5-10 years	2	8.0	10	40.0	
	>10 years	6	24.0	1	4.0	
Training sessions	No	19	76.0	18	72.0	0.753
	Yes	6	24.0	7	28.0	

Findings show participants age, the mean age for nurses in study group is 27, the age 20-29 years old were recorded the highest percentage among nurses in study group (n=18; 72%). While, the mean age for nurses in control group is 30, the age

20-29 years old were recorded the highest percentage among nurses in control group (n=17; 68%). Respect to the gender, the female nurses were predominated among nurses in both study and control groups (n=23; 92%) and (n=21; 84%) respectively. In regard with education, the study participants expressed a school nursing in both study and control groups (n=21; 84%) and (n=20; 80%) respectively. Years of experience related findings, the nurses in both study and control groups had less than five years of experience (n=17; 68%) and (n=14; 56%) respectively. In terms of training courses, the nurses in both study and control groups exhibit no participants in training session (n=19; 76%) and (n=18; 72%) respectively. There were no-significant differences in sample characteristics between both groups ($p > 0.05$).

Table 2
Independent Sample t-test between the Study and Control Group responses at pre-posttest Knowledge related to Neonatal Pain Management

	Weighted	Mean	S.D	t-value	d.f	$p \leq 0.05$	Sig
Pre-test Knowledge	Study	1.09	0.915	0.322	48	0.749	NS
	Control	1.17	0.867				
Post-test Knowledge	Study	2.75	0.656	6.571	48	0.000	HS
	Control	1.27	0.917				

M: Mean, SD: Standard deviation, t: t-test, d.f: Degree of freedom, Sig: Significance, p: Probability value, HS: NS: No significant, Highly significant

This table shows that there is a no statistical significant difference between study ($M \pm SD = 1.09 \pm 0.915$) and control ($M \pm SD = 1.17 \pm 0.867$) groups in the pre-test period of measurement ($p = 0.749$). While, there is a highly statistical significant difference between the study ($M \pm SD = 2.75 \pm 0.656$) and control ($M \pm SD = 1.27 \pm 0.917$) groups at the post-test period of measurement ($p = 0.000$). With respect to the statistical mean, the study results indicate that there is an improvement in the study group responses after the application of the program compared with the control group.

Table 3
Significant Differences in Knowledge and Nurses Age (n=25)

Age	Source of variance	Sum of Squares	d.f	Mean Square	F	$p \leq 0.05$
Pre-test knowledge	Between Groups	.754	2	.377	.428	.657 No-sig.
	Within Groups	19.377	22	.881		
	Total	20.132	24			
Post-test knowledge	Between Groups	1.406	2	.703	1.732	.200 No-sig.
	Within Groups	8.927	22	.406		
	Total	10.333	24			

Findings illustrated there were no significant differences in nurses knowledge about neonatal pain management with regard age groups at pre-test ($p = 0.657$) and posttest ($p = 0.200$) after education program.

Table 4
Significant Differences in Knowledge and Nurses Gender (n=25)

	Gender	Mean	S.D	t-value	d.f	$p \leq 0.05$	Sig
Pre-test knowledge	Male	.514	0.606	0.932	23	0.361	No-sig.
	Female	1.14	0.930				
Post-test knowledge	Male	2.54	0.888	0.465	23	0.646	No-sig.
	Female	2.77	0.655				

Findings illustrated there were no-significant differences in nurses knowledge about neonatal pain management at two period of measurement pre-test ($p=0.361$) and posttests ($p=0.646$) after education program with regard male and female nurses.

Table 5
Significant Differences in Knowledge and Nurses Education Level (n=25)

Education level	Source of variance	Sum of Squares	d.f	Mean Square	F	$p \leq 0.05$
Pre-test knowledge	Between Groups	3.339	2	1.669	2.187	.136 No-sig.
	Within Groups	16.793	22	.763		
	Total	20.132	24			
Post-test knowledge	Between Groups	.018	2	.009	.020	.981 No-sig.
	Within Groups	10.314	22	.469		
	Total	10.333	24			

Findings illustrated there were no significant differences in nurses knowledge about neonatal pain management with regard education level at pre-test ($p=0.136$) and posttest ($p=0.981$) after implementation of education program.

Table 6
Significant Differences in Knowledge and Nurses Years of Experience (n=25)

Experience	Source of variance	Sum of Squares	d.f	Mean Square	F	$p \leq 0.05$
Pre-test knowledge	Between Groups	.250	2	.125	.138	.872 No-sig.
	Within Groups	19.882	22	.904		
	Total	20.132	24			
Post-test knowledge	Between Groups	.356	2	.178	.392	.680 No-sig.
	Within Groups	9.977	22	.453		
	Total	10.333	24			

Findings illustrated there were no significant differences in nurses knowledge about neonatal pain management with regard years of experience at pre-test ($p=0.872$) and posttest ($p=0.680$) after implementation of education program.

Table 7
Significant Differences in Knowledge and Nurses Training Courses (n=25)

Training courses	Source of variance	Sum of Squares	d.f	Mean Square	F	$p \leq 0.05$
Pre-test knowledge	Between Groups	.086	1	.086	.099	.756 No-sig.
	Within Groups	20.046	23	.872		
	Total	20.132	24			
Post-test knowledge	Between Groups	.018	1	.018	.041	.841 No-sig.
	Within Groups	10.314	23	.448		
	Total	10.333	24			

Findings illustrated there were no significant differences in nurses knowledge about neonatal pain management with regard training at pre-test ($p=0.756$) and post test ($p=0.841$) after implementation of education program.

Discussion

Findings show participants age, the mean age for nurses in study group is 27, the age 20-29 years old were recorded the highest percentage among nurses in study group (n=18; 72%). While, the mean age for nurses in control group is 30, the age 20-29 years old were recorded the highest percentage among nurses in control group (n=17; 68%). Respect to the gender, the female nurses were predominated among nurses in both study and control groups (n=23; 92%) and (n=21; 84%) respectively. In regard with education, the study participants expressed a school nursing in both study and control groups (n=21; 84%) and (n=20; 80%) respectively. Years of experience related findings, the nurses in both study and control groups had less than five years of experience (n=17; 68%) and (n=14; 56%) respectively. In terms of training courses, the nurses in both study and control groups exhibit no participants in training session (n=19; 76%) and (n=18; 72%) respectively. There were no-significant differences in sample characteristics between both groups ($p > 0.05$).

This table shows that there is a no statistical significant difference between study ($M \pm SD = 1.09 \pm 0.915$) and control ($M \pm SD = 1.17 \pm 0.867$) groups in the pre-test period of measurement ($p=0.749$). While, there is a highly statistical significant difference between the study ($M \pm SD = 2.75 \pm 0.656$) and control ($M \pm SD = 1.27 \pm 0.917$) groups at the post-test period of measurement ($p=0.000$). With respect to the statistical mean, the study results indicate that there is an improvement in the study group responses after the application of the program compared with the control group.

Findings illustrated there were no significant differences in nurses knowledge about neonatal pain management with regard to demographic characteristic of participant at pre-test and posttest after implementation of education. This findings is similar to the findings of Abd El-Aziz et al. (2018), The aim of the study was to improve nurses' performance towards non pharmacological pain management among neonates in neonatal intensive care unit through the implementation of an educational program. Quasi-experimental design was used in carrying out the study. A convenience sample of 51 neonatal nurses working in

the neonatal intensive care unit affiliated to Mansoura University Children's Hospital. There was a highly statistically significant positive effect of the educational program in improving nurses' performance towards non-pharmacological pain management in neonatal intensive care unit ($p < 0.001$), study recommended Conducting more periodical continuing education for neonatal nurses that encouraging more frequent use of non-pharmacological methods in clinical care with necessity of follow up that must be motivated by a multidisciplinary team to be a routine care inside the unit.

This finding is comparable with the finding of the study conducted in port said (El-husseiny et al., 2019), and another study at Minia University for Obstetric and Pediatric and General Hospitals at neonatal care units (Mohamed, et al., 2019). This might be due to the fact that training may increase their knowledge toward neonatal pain management, and may also add their value of benefit of neonatal pain management.

Numerous studies shows that best methods to increase knowledge are though educational program this might be because of commitment of the sample, use of modern educational method e.g. use of power point, Dissection is effective method for increasing knowledge level. Also, in this study we use modern educational technique and focus on discussion method, also study sample was active and was commitment in the study program. These finding of demographic data and nurses knowledge are in line with Sujatha et al. (2015), showed that the Pre-test and Post-test knowledge scores found statistically significant $t = 1.671$, $p < 0.05$. It reveals the effectiveness of structured teaching program. And the study also shows that there is no significant association between the knowledge scores of the staff nurses with the selected demographic variables like age, gender, educational qualification, total clinical experience, previous knowledge regarding Neonatal pain management.

Findings is supported by Hoda, (2020) study about (Effect of Educational Program on Nurses' Knowledge and Practices Regarding Preterm Infants' Pain Response and Nonpharmacological Strategies) indicate that there were statistical difference between nurses' years of experience and total knowledge score after the implementing the program but there were no statistical difference between nurses' age and total knowledge score after the program.

Also study result consistent with El Awady and Gharib, (2021) who stated (Enhancing Pediatric Nurses' Performance Regarding Selected Non-Pharmacological Techniques to Alleviate Pain in Neonates: An Educational Program) showed that there were no statistical difference between years of experience, age, and training courses and nurses knowledge scores after applying the program. so, organizational factors play a crucial role in the health care services development for the neonates, involving pain management. It is necessary to provide the needed training for all the personnel working with neonates (Azza et al., 2020).

In the present study educational program is not affected by participant age, gender, years of experience, educational levels and training course so it can be applied to increase nurses knowledge regardless of these variables.

Conclusion

The study concluded, that a clear improvement of the knowledge of nurses regarding how to manage newborns pain after applying the educational program. Also there no statistical differences between effectiveness of the program and nurses demographic characteristics

Recommendations

1. The ministry of health should adjust training on nursing care about neonatal pain management and give direction health department to encourage nurses to participate
2. Encouraging nurses to be enrolled in training sessions to improve their knowledge to keep them up to date toward information about neonatal pain management.
3. It is recommended to make guidelines about neonatal pain assessment scale available in all neonatal care unit.

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Conflict of Interest: Nothing will happen to harm anyone.

Ethical Clearance: An approval was attained from the Scientific Research Ethical Committee from the University of Kerbala/ Nursing College. Informed consent was obtained from each participant to be enrolled in this study. Furthermore, each participant is given the right to be withdrawn from the study at any time.

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