

Effects of Modulating Environmental Stimuli on pain experience During IV Cannulation in Neonates in NICUs

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ABSTRACT

Background and Objectives: To assess the nurse's knowledge regarding effects of modulating environmental stimuli on pain experience during IV Cannulation in neonates in NICUs.

To evaluate the nurse's knowledge after nursing interventions of environmental stimuli on pain experience during IV-Cannulation in Neonates in NICUs.

METHODOLOGY: A quasi-experimental study design was conducted in Ali Fatima Hospital Lahore. The study involved 30 participants' female nurses who were chosen using a combination of universal and convenient sampling method. The data collection process involved the use of modified Questionnaires. Questionnaires section consisted a non-randomized controlled trial with pre and post tests which aimed to assessing the knowledge of nurses and to evaluate the knowledge after nursing interventions. The intervention group (n=30) nurses received the comprehensive knowledge about pain management in Neonates in NICUs. After that, the data was analyzed using the SPSS software.

RESULTS: The sample consists of 30 participants. 56.7% (17 participants) are aged between 20-22 years. 43.3% (13 participants) are aged between 23-25 years. All participants (100%) are female, indicating a gender-specific sample. 33.3% (10 participants) hold a diploma. 66.7% (20 participants) have a degree. The significant increase in knowledge scores from pre-intervention (mean = 9.4000) to post-intervention (mean = 13.9667) indicates that the intervention (modulating environmental stimuli) effectively enhanced nurses' knowledge regarding the management of pain during IV -Cannulation in neonates. The p-value (Sig. 2-tailed) is .000, indicating a statistically significant improvement.

CONCLUSION: The sample consists of 30 participants. 56.7% (17 participants) are aged between 20-22 years. 43.3% (13 participants) are aged between 23-25 years. All participants (100%) are female, indicating a gender-specific sample. 33.3% (10 participants) hold a diploma. 66.7% (20 participants) have a degree. The significant increase in knowledge scores from pre-intervention (mean = 9.4000) to post-intervention (mean = 13.9667) indicates that the intervention (modulating environmental stimuli) effectively enhanced nurses' knowledge regarding the management of pain during IV -Cannulation in neonates. The p-value (Sig. 2-tailed) is .000, indicating a statistically significant improvement.

KEYWORDS: Neonates, nicu, IV cannulation, pain, environmental stimuli, randomized controlled trial.

INTRODUCTION

Neonates admitted to NICUs often undergo various painful procedures as part of their medical care, with intravenous (IV) cannulation being one of the most common. Pain experienced during such procedures not only causes distress to the neonates but can also have long-term physiological and psychological consequences. Therefore, effective pain management strategies are essential in neonatal care settings. Modulating environmental stimuli has emerged as a promising

approach to alleviate pain and distress during medical procedures in neonates. Environmental factors such as noise, light, touch, and non-pharmacological techniques can influence the neonate's perception of pain and stress. By optimizing these stimuli, it is possible to create a more conducive environment for pain management.¹⁻⁴

This literature review provides a summary of the current literature on pain management of neonates.

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Effective pain management presents positive patient outcomes, such as a decrease in length of stay in hospital; reduced incidences of infections; and steady increase in the weight of a child. There is the belief that neonates do not feel pain⁵⁻⁸

The total number of newborns who were candidates to receive a IV-Cannulation was 80, of whom 60 were included in the study. The neonates have no surgery and congenital anomalies. Both genders were included in this study; 24.6% of them suffer from respiratory distress syndrome and prematurity simultaneously.⁹ A study has shown that the nurses' knowledge and attitude are important in implementation of pain management program, guidance on the possible improvement of pain management is instructive in design and hold training courses to inform the Personnel. According to the review, the root causes of insufficient pain management in NICUs are NICU nurses' lack of expertise, lack of collaboration, and ineffective communication¹⁰⁻¹²

METHODOLOGY

A quasi-experimental study design could be suitable, specifically a non-randomized controlled trial with pre-and post-tests.

The research work was conducted in Ali Fatima Hospital Lahore. Slovin's formula was used to determine the sample size for simple random sampling. The formula is given by $n = N / (1 + N(e^2))$, where n is the sample size, N is the population size, and e is the desired level of precision.

The sample size was (n= 30) nurses. The population would consist of registered pediatric nurses working in either inpatient or outpatient settings where IV therapy is regularly administered.

Non-Randomized sampling techniques was used. The pre and post results were analyses using paired sample statistics to determine the effects of interventional education. The research setting for this study was the neonatal intensive care unit at Ali Fatima Hospital Lahore. At Hospital, the upgraded neonatal unit can accommodate 20 babies, including provision for kangaroo mother care (KMC). The baseline characteristics of participant was collected with the help of questionnaire after distributing the questionnaire among the participants

RESULTS

The sample consists of 30 participants. 56.7% (17 participants) are aged between 20-22 years. 43.3% (13 participants) are aged between 23-25 years. All participants (100%) are female, indicating a gender-specific sample. 33.3% (10 participants) hold a diploma.

66.7% (20 participants) have a degree. This literature review provides a summary of the current literature on pain management of neonates.

Table 1: Demographic table shows variable of frequency and percentage.

		Frequency	Percent
Age	20-22	17	56.7
	23-25	13	43.3
Gender	Female	30	100.0
Education	Diploma	10	33.3
	Degree	20	66.7

Statistical Package for the Social Sciences was used to analyze the gathered data which reflect the data as graphical representations.

Pre-Intervention Knowledge: The mean score is 9.4000, with a standard deviation of 3.71019.

T test (paired sample test)

Paired Samples Statistics			
		Mean	N
Pair 1	Pre Knowledge	9.4000	30
	Post Knowledge	13.9667	30
			Value of p
			<0.001

The pre-training results showed a moderate to high level of understanding across various aspects related to modulating environmental stimuli for pain management during IV cannulation in neonates. However, there were some areas of uncertainty or misunderstanding, as indicated by incorrect responses ranging from 16.7% to 50.0%.

The post-training results demonstrated a significant improvement in understanding, with the majority of respondents correctly answering questions across all aspects covered in the training. Correct responses ranged from 86.7% to 100%, indicating a comprehensive grasp of the material.

Before the training program, there were notable knowledge gaps and inconsistencies among participants, with incorrect responses observed in several questions.

The training program effectively addressed these knowledge gaps and uncertainties, resulting in a substantial improvement in understanding and proficiency among participants. The training program had a positive and significant impact on participants' understanding of modulating environmental stimuli for pain management during IV cannulation in neonates.

DISCUSSION

There are great opportunities for neonatal nurse to improve their knowledge and skills, and highly training in the management of pain by performing non-pharmacological methods that have proven to be powerful aids in reducing procedural pain in neonates. 13-14 Regarding the nurses' characteristics, the present study results revealed that, This suggests that the intervention

successfully addressed knowledge gaps and provided valuable insights into pain management for neonates. The 95% confidence interval for the mean difference does not include zero, indicating that the improvement in knowledge is statistically significant. 15-16 The findings suggest that the intervention of modulating environmental stimuli significantly improves nurses' knowledge regarding pain management during IV cannulation in neonates. This improvement in knowledge is likely to contribute to better pain management practices, enhancing the overall care and comfort of neonates in the NNU.

These results highlight the importance of interventional education regarding environmental factors in pain perception and management in neonates. By creating a supportive environment with reduced sensory input, it is possible to minimize the pain and distress associated with medical procedures such as IV cannulation. This has significant implications for neonatal care practices in NICU settings, where optimizing pain management is paramount. 17-20

CONCLUSION

Providing education to nurses regarding Modulating environmental stimuli during IV cannulation in neonates admitted to NICUs can effectively improve their understanding of neonatal pain and management. Implementation of such interventions may contribute to enhanced neonatal care practices in NICU settings. Further research is warranted to validate these findings and explore additional strategies for optimizing pain management in neonates.

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Authors Contributions:

Amna Zia, Iqra Khan, Abida Parveen: Substantial contributions to the conception and design of the work.

Ms. Hajra sarwer, Ms. Alina Hameed: Design of the work and the acquisition.

Amina Kainat and Kanwal Zubair: Drafting the work. Final approval of the version to be published.

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