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Original Article

A Descriptive Study to Assess the Knowledge of Staff Nurses Regarding the Use of Buzzy Device for Pain Reduction during Injections among Pediatric Patients in Selected Hospitals of Kanpur, Uttar Pradesh

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Abstract

Pain during injection is a common and distressing experience among pediatric patients, often leading to fear and anxiety and negatively affecting future healthcare interactions[1]. Non-pharmacological interventions such as the Buzzy device, which combines vibration and cold therapy, have been shown to be effective in reducing injection-related pain[2.] The present study aimed to assess the knowledge of staff nurses regarding the use of the Buzzy device for pain reduction during injection among pediatric patients in selected hospitals of Kanpur, Uttar Pradesh. A descriptive research design was adopted for the study. A total of 100 staff nurses were selected using a non-probability convenient sampling technique. Data were collected using a structured knowledge questionnaire and analyzed using descriptive and inferential statistics. The findings revealed that the majority of staff nurses had moderate knowledge, while some had adequate and a few had inadequate knowledge regarding the use of the Buzzy device. A significant association was found between knowledge scores and selected demographic variables. The study concluded that although staff nurses possess a moderate level of knowledge, there is a need for structured educational and training programs to enhance their knowledge and promote effective utilization of the Buzzy device for better pain management among pediatric patients.

Keywords: Buzzy Device, Pain reduction, Pediatric patients, Staff nurses, Knowledge.

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Introduction

Pain during pediatric procedures such as injections is a common and distressing experience among children. Inadequate pain management may lead to fear, anxiety, and negative behavioral responses, which can affect children's cooperation and future healthcare experiences[3].

Non-pharmacological methods such as cold application, distraction, and vibration techniques are widely used because they are safe, effective, and easy to apply in clinical settings[4]. These methods help in reducing pain perception without causing side effects and are considered suitable for pediatric patients.

The Buzzy Device is an innovative non-pharmacological technique that combines cold and vibration and works on the gate control theory of pain to reduce discomfort during injections4. It is simple to use and helps in minimizing pain and anxiety among children during needle-related procedures.

Several studies have reported that the Buzzy Device is effective in reducing pain intensity and anxiety among pediatric patients during injection procedures[5].

On-pharmacological pain relief methods are widely recommended because they are safe, economical, and easy to apply in clinical settings. Methods such as cold application, distraction, and vibration techniques are helpful in reducing pain perception without causing side effects. The Buzzy Device is an effective technique that combines cold and vibration and works on the gate control theory of pain to decrease discomfort during injections Several studies have shown that the Buzzy Device helps in reducing pain and anxiety among pediatric patients during needle-related procedures[7]. Therefore, it is important to assess the knowledge and practice of staff nurses regarding the use of the Buzzy Device to improve pediatric pain management[6].

A randomized controlled open-label study was conducted by Romano et al. (2023) at Pisa University Hospital, Italy, to evaluate the effectiveness of the Buzzy device in reducing needle-related pain among children. The study included 234 pediatric patients aged 1 month to 18 years who were randomly assigned to either the Buzzy (intervention) group or the control group. Pain was assessed using age-appropriate standardized pain scales. The results revealed that the intervention group experienced significantly lower pain scores compared to the control group (2.5 ± 2.4 vs 4.7 ± 2.8, $P < 0.001$), and pain was found to be inversely correlated with age. A significant reduction in pain was observed across all age groups, with no difference between boys and girls. The study concluded that the Buzzy device is an effective, safe, and non-pharmacological intervention for reducing pain during venipuncture among children and can be easily implemented in clinical practice.[7]

A quasi-experimental study was conducted by Cho et al. (2022) in Taiwan to evaluate the effectiveness of the Buzzy device in reducing pain during intravenous injection among hospitalized children. The study included 60 children aged 3 to 7 years, who were divided into treatment and non-treatment groups with 30 participants in each group. Pain was assessed using standardized tools including the Wong-Baker Faces Scale (WBFS) and FLACC scale at different time intervals. The findings revealed that the Buzzy device significantly reduced pain levels in the intervention group compared to the control group ($P < 0.001$), and children in the treatment group had a more pleasant experience during the procedure. The study concluded that the Buzzy device is an effective non-pharmacological intervention for reducing injection-related pain among hospitalized children and can be widely used in clinical practice.[8]

Objectives of The Study

- To assess the level of knowledge of staff nurse regarding the use of Buzzy device regarding the use of Buzzy device for pain reduction during injections among pediatric patients
- To find out the association between knowledge of staff nurse and selected demographic variables.

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Hypothesis

Research hypothesis

"A hypothesis is a tentative predictive or explanation of the relationship between the variable"

H_1: There is a significant association between knowledge of staff with their selected demographic variables

Null hypothesis

H_{01}: There will be no significant association between knowledge of staff nurses with their selected demographic variables.

Materials and Methods

Research Approach: The present study used a **quantitative research approach**

Research Design A **non-experimental descriptive survey research design** was adopted for the study.

Variables

Research variable- In this present study, research variable was the knowledge of staff nurses regarding the use of Buzzy Device for pain reduction during injection among pediatric patient.

Demographic variables – In this present study, demographic variables such as age, gender, educational qualification, years of experience, area of work, previous knowledge, and source of information**.**

Population

In this present study the population was all staff nurses working in hospitals

Target population- The Target population for the present study was Staff nurses working in pediatric departments

Accessible population- The Accessible population include Staff nurses working in Shyam Children & Maternity Centre, Kalyanpur, Kanpur and Ursula Horsman Memorial Hospital, Kanpur, Uttar Pradesh

Sample- The sample for the study comprise staff nurses who fulfill the inclusion and exclusion criteria

Sample size- The sample size of the study was 100 staff nurses

Sampling technique- In this study, **non-probability convenient sampling technique** was used to select the sample

Inclusion criteria-

Staff nurses working in pediatric wards

Staff nurses willing to participate in the study

Staff nurses available during data collection

Exclusion criteria-

Staff nurses who were on leave during data collection

Staff nurses not willing to participate in the study

Method of Data Collection

Prior permission was obtained from the concerned hospital authorities. The purpose of the study was

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explained to the staff nurses and informed consent was taken. Data were collected from 100 staff nurses using a structured questionnaire consisting of demographic variables, knowledge questions, and practice checklist regarding the use of the buzzy device. Confidentiality of the participants was maintained throughout the study.

Data collection tool

Data collection was carried out using a structured questionnaire designed to assess the knowledge of staff nurses regarding the use of the Buzzy device for pain reduction during injection among pediatric patients.

Development of research tool

The structured research tool was developed based on an extensive review of literature, expert opinions, and evidence-based nursing practices related to the use of the Buzzy device for pain management during needle-related procedures in children.

Description of the tool

Structured Knowledge Questionnaire:

Results

Section-A

Major finding related to demographic variables

- Majority of the staff nurses (55%) were in the age group of 31–40 years.
- Majority of the staff nurses (75%) were female.
- Majority of the staff nurses (55%) had completed B.Sc. Nursing.
- Majority of the staff nurses (40%) had 6–10 years of work experience.
- Majority of the staff nurses (52%) were working in ICU.
- Majority of the staff nurses (60%) had previous knowledge regarding the use of the Buzzy device.
- Majority of the staff nurses (45%) obtained information from in-service education programs

Section B: Knowledge of Staff Nurses Regarding Use of Buzzy Device

Level of Knowledge among Staff Nurses (N = 100)

S.NO	Level of Knowledge	Score Range	Frequency(f)	Percentage (%)
1.	Poor	0-10	20	20%
2.	Moderate	11-20	50	50%
3.	Good	21-30	30	30%
	Total		100	100%

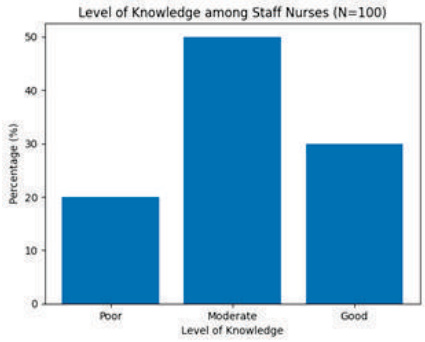

Figure 01: level Knowledge of Staff

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Section-C Association between Level of Knowledge Among staff nurse and Selected Demographic Variables regarding the use of buzzy device (N = 100)

S. No	Demographic Variables	Category	poor	Moderate	Good	χ²	df	p-value	Significance
1.	Age	20–25 years	10	15	5	5.20	6	0.158	Not Significant
		26–30 years	5	20	10				
		31–35years	3	10	7				
		>35years	2	5	8				
2.	Gender	Male	8	8	4	3.10	2	0.211	Not Significant
		Female	12	42	26				
3.	Educational Status	GNM	15	20	5	9.20	6	0.027	Significant
		B.Sc. Nursing	3	20	12				
		Post Basic B.Sc. Nursing	1	7	7				
		M.Sc. Nursing	1	3	6				
4.	Clinical Experience	<1 year	12	10	3	8.10	6	0.044	Significant
		1–3 years	5	25	10				
		4–6 years	2	10	8				
		>6 years	1	5	9				
5.	Area of work	Pediatric ward	5	25	15	6.80	4	0.078	Not Significant
		General ward	10	15	5				
		ICU/NICU/PICU	5	10	10				
6.	Previous knowledge	Yes	5	30	25	12.50	2	0.002	Significant
		No	15	20	5				

Nursing Implication

Nursing Practice: The findings of the study imply that in nursing practice, staff nurses should incorporate non-pharmacological pain management techniques such as the use of the Buzzy device during intramuscular injections in pediatric patients. This will help in reducing pain, fear, and anxiety among children and improve the overall quality of care. Nurses should also focus on providing child-centered care and make such techniques a routine part of clinical practice.

Nursing Education: In nursing education, the study highlights the need to enhance the knowledge of nursing students and staff nurses regarding the use of vibration techniques for pain management. This can be achieved by including such topics in the nursing curriculum and organizing regular workshops, seminars, and continuing nursing education (CNE) programs. Demonstration and hands-on training should also be provided to improve practical skills.

Nursing Administration: From the administrative perspective, hospital authorities should develop and implement protocols and guidelines for the use of the Buzzy device in clinical settings. Adequate supply and availability of such devices should be ensured in pediatric units. Additionally, regular in-service education and training programs should be organized to update the knowledge and skills of staff nurses.

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Nursing Research: In the field of nursing research, the study suggests that further research can be conducted with larger sample sizes and in different clinical settings to validate the findings. Comparative studies can also be carried out to assess the effectiveness of the Buzzy device in comparison with other non-pharmacological pain management techniques. This will help in strengthening evidence-based nursing practice.

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Conflicts of interests: The authors declare that they have no conflict of interest

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