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Original Article

A Descriptive Study to Assess the Knowledge Regarding Use of the Kaleidoscope Distraction Technique in Reducing Procedural Pain Among Mothers of Hospitalized Children Aged 5–10 Years at Selected Hospitals, Kanpur, U.P.

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Abstract

Procedural pain is a common and distressing experience among hospitalized children undergoing invasive procedures such as injections and venipuncture, which often leads to anxiety, fear, and poor cooperation during treatment. Non-pharmacological interventions, particularly distraction techniques, are considered safe, effective, and economical methods for reducing pain perception in children. The kaleidoscope distraction technique is a simple visual method that diverts the child's attention away from painful stimuli and enhances comfort during procedures.

The present study was conducted to assess the knowledge regarding the use of the kaleidoscope distraction technique in reducing procedural pain among mothers of hospitalized children aged 5–10 years. A descriptive cross-sectional research design was adopted, and 50 mothers were selected using a convenient sampling technique from a selected hospital in Kanpur, Uttar Pradesh. Data were collected using a self-structured questionnaire, and analysed using descriptive and inferential statistics.

The findings revealed that 52% of mothers had moderate knowledge, 32% had inadequate knowledge, and only 16% had adequate knowledge regarding the kaleidoscope distraction technique. The mean knowledge score was 13.84 ± 5.83, indicating an overall moderate level of knowledge among mothers.

A statistically significant association was found between knowledge level and selected demographic variables such as educational status ($p < 0.05$) and previous hospitalization of the child ($p < 0.05$). However, no significant association was observed with variables such as age, occupation, type of family, number of children, source of information, and area of residence.

The study highlights the need for improving mothers' awareness through structured educational programs and guidance by healthcare professionals. Enhancing knowledge regarding simple, non-pharmacological techniques like the kaleidoscope distraction method can significantly contribute to better pain management and improved comfort among hospitalized children.

Keywords: Procedural pain, Kaleidoscope distraction technique, Knowledge, Mothers, Hospitalized children, Pediatric nursing.

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Introduction

Procedural pain is a common and distressing experience among hospitalized children, often associated with diagnostic and therapeutic interventions such as injections and venipuncture[1]. Inadequate management of procedural pain can lead to anxiety, fear, and negative behavioural responses, affecting both the child's psychological well-being and cooperation during treatment[2]. Children aged 5–10 years are particularly sensitive to painful procedures due to their developmental stage and limited coping abilities[3].

Non-pharmacological pain management strategies, especially distraction techniques, have been widely recommended as safe and effective methods for reducing pain perception in children[4]. The kaleidoscope distraction technique is a simple visual intervention that engages a child's attention through colourful patterns, thereby diverting focus away from painful stimuli[5]. Parents, particularly mothers, play a crucial role in supporting children during hospitalization, and their knowledge regarding such techniques can enhance pain management and promote child comfort[6].

Procedural pain is a common experience among hospitalized children undergoing routine diagnostic and therapeutic procedures such as injections, venipuncture, and intravenous cannulation[1,7]. Inadequate management of procedural pain can result in increased anxiety, fear, and behavioral distress, which may negatively influence a child's cooperation with treatment and overall hospital experience[2,8].

Non-pharmacological interventions, especially distraction techniques, have gained importance as safe, economical, and easily applicable methods for reducing pain perception without causing adverse effects[4,9]. The kaleidoscope distraction technique provides visual stimulation that engages children's attention and diverts focus away from painful stimuli, thereby helping to reduce discomfort during procedures[5]. Despite its simplicity and effectiveness, the utilization of such techniques largely depends on the awareness and participation of caregivers[10].

Mothers play a vital role in providing emotional reassurance and support to hospitalized children. Their knowledge regarding distraction techniques can significantly contribute to successful pain management and promote family-cantered care practices[6]. However, limited awareness and lack of education about non-pharmacological pain relief methods may hinder their effective use in clinical settings. Therefore, assessing mothers' knowledge regarding the use of the kaleidoscope distraction technique is necessary to identify knowledge gaps and encourage educational interventions aimed at improving pediatric pain management outcomes.

Objectives

- To assess the level of knowledge regarding the use of the kaleidoscope distraction technique in reducing procedural pain among mothers of hospitalized children aged 5–10 years.
- To determine the association between the level of knowledge regarding the kaleidoscope distraction technique and selected demographic variables of mothers of hospitalized children.
- To identify the need for educational intervention regarding the use of the kaleidoscope distraction technique among mothers.

HYPOTHESIS

H_1: There is a significant difference in the level of knowledge regarding the use of the kaleidoscope distraction technique among mothers of hospitalized children aged 5–10 years.

H_2: There is a significant association between the level of knowledge regarding the kaleidoscope distraction technique and selected demographic variables of mothers of hospitalized children aged 5–10 years.

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Materials and Methods:

Research Approach- In the present study, descriptive approach was used.

Research Design- The research design used in this study was descriptive research design.

VARIABLES-

Dependent Variable: In this study, the dependent variable is the knowledge of mothers regarding the use of the kaleidoscope distraction technique in reducing procedural pain among hospitalized children aged 5–10 years.

Demographic-Variables: The demographic variables included in this study are age of mother, educational status, occupation, type of family, number of children, previous hospitalization of the child, source of information, and area of residence (urban/rural).

Population: The population for this study comprises of mothers of hospitalized children.

Target Population: In this study, the target population was mothers of hospitalized children aged 5–10 years.

Accessible Population: In this study, the accessible population consisted of mothers of hospitalized children aged 5–10 years who were admitted to selected hospital at Kanpur, Uttar Pradesh, met the inclusion criteria, and were willing to participate in the study.

Sample: The sample for the present study comprises of mothers of hospitalized children aged 5–10 years who fulfilled the inclusion and exclusion criteria.

Sample Size: The sample size for the present study consists of 50 mothers of hospitalized children aged 5–10 years.

Sampling Technique: In the present study, convenient sampling technique has been used for selection of mothers of hospitalized children.

Sampling Criteria

Inclusion Criteria:

i. Mothers of children aged 5–10 years admitted in the hospital.
ii. Mothers of children undergoing invasive procedures such as injections or venipuncture.
iii. Mothers who are present during the period of data collection.
iv. Mothers who are willing to participate and give informed consent.

Exclusion Criteria:

i. Mothers of children who are chronically ill or mentally challenged.
ii. Mothers of children with sensory impairments.
iii. Mothers who are not available during the data collection period.

Description of Tool

The tool used for data collection in this study was a structured self-administered questionnaire designed to assess the knowledge of mothers regarding the use of the kaleidoscope distraction technique in reducing procedural pain among hospitalized children. The tool was developed after an extensive review of literature and consultation with experts in pediatric nursing. The tool consists of two sections.

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Section-A

Demographic Data

This section was designed to collect baseline information about the participants. It includes variables such as:

Age of mother
Educational status
Occupation
Type of family (nuclear/joint)
Number of children
Previous hospitalization of the child (yes/no)
Source of information (health personnel/media/friends & relatives/others)
Area of residence (urban/rural)

Section- B

Knowledge Questionnaire

This section consists of structured multiple-choice questions related to the kaleidoscope distraction technique, including its meaning, purpose, procedure, advantages, and role of mothers in reducing procedural pain among children.

Each correct answer was awarded one mark, and each incorrect answer was given zero mark.

The total score ranged from 0 to 25.

Scoring Interpretation

The knowledge scores were categorized as follows:

Inadequate Knowledge: 0–12
Moderate Knowledge: 13–19
Adequate Knowledge: 20–25

Validity and Reliability of the Tool

The tool was validated by experts in pediatric nursing and medical professionals to ensure content validity. The reliability of the tool was established using appropriate statistical methods (such as Cronbach's alpha), and it was found to be reliable for data collection.

Data Collection Procedure

Ethical clearance was obtained from the Institutional Ethics Committee, and formal permission was taken from the concerned hospital authorities prior to data collection. Mothers who met the inclusion criteria were selected using a convenient sampling technique. The purpose of the study was explained to the participants, and informed consent was obtained before data collection.

A structured self-administered questionnaire was distributed to 50 mothers of hospitalized children aged 5–10 years. Clear instructions were provided, and adequate time was given to complete the questionnaire. The investigator remained available throughout the data collection period to clarify any doubts without influencing the responses.

Confidentiality and anonymity of the participants were strictly maintained. The data collection was carried out over a period of 1–2 weeks. After completion, the questionnaires were collected, checked for completeness, coded, and prepared for data analysis using appropriate statistical methods.

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Plan for Data Analysis

The collected data were organized, tabulated, and analysed using both descriptive and inferential statistics.

Descriptive statistics such as frequency and percentage were used to describe the demographic variables and the level of knowledge among mothers, while mean and standard deviation were calculated to determine the average knowledge score and variability of the data.

Inferential statistics**,** specifically the chi-square (χ^2) test, was used to assess the association between the level of knowledge and selected demographic variables such as educational status, occupation, and previous hospitalization of the child. The level of significance was set at $p < 0.05$, where values less than 0.05 were considered statistically significant.

Results

Section-A:

Percentage Distribution of Demographic Variables (N = 50)

S. No.	Demographic Variable	Categories	Frequency (f)	Percentage (%)
1	Age of Mother	20–25 years	12	24%
		26–30 years	22	44%
		31–35 years	10	20%
		Above 35 years	6	12%
2	Educational Status	Primary education	10	20%
		Secondary education	18	36%
		Higher secondary	12	24%
		Graduate & above	10	20%
3	Occupation	Housewife	30	60%
		Private employee	8	16%
		Government employee	5	10%
		Self-employed	7	14%
4	Type of Family	Nuclear	22	44%
		Joint	28	56%
5	Number of Children	One child	14	28%
		Two children	24	48%
		Three or more	12	24%
6	Previous Hospitalization of Child	Yes	18	36%
		No	32	64%
7	Source of Information	Health personnel	20	40%
		Media (TV/Internet)	12	24%
		Friends/Relatives	10	20%
		No prior information	8	16%
8	Area of Residence	Urban	29	58%
		Rural	21	42%

Interpretation:

The demographic data revealed that the majority of mothers 22 (44%) were in the age group of 26–30 years. Regarding educational status, 18 (36%) had secondary education. Most of the mothers 30 (60%) were housewives. In relation to type of family, 28 (56%) belonged to joint families. Majority of mothers 24 (48%) had two children. Most of the children 32 (64%) had no previous

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hospitalization. The main source of information was health personnel 20 (40%). Majority of mothers 29 (58%) belonged to urban areas. These findings indicate moderate educational background and limited prior exposure to hospital procedures among participants.

Section B: Knowledge Level Regarding Kaleidoscope Distraction Technique

Knowledge Level	Frequency (n)	Percentage (%)
Inadequate Knowledge	16	32%
Moderate Knowledge	26	52%
Adequate Knowledge	8	16%

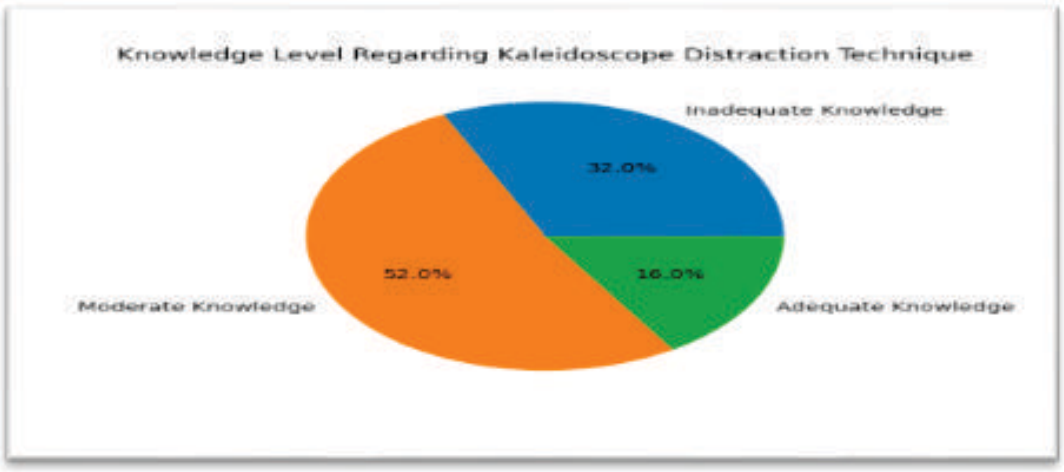

Figure 01: Knowledge Level Regarding Kaleidoscope Distraction Technique

Interpretation:
Majority of mothers (52%) had moderate knowledge, followed by 32% with inadequate knowledge and only 16% with adequate knowledge. This indicates a need for educational programs to improve awareness regarding the kaleidoscope distraction technique.

Section C:
Calculation of Mean and Standard Deviation
Total Score Mean = 13.84
Standard Deviation (SD) = 5.83
Interpretation:
The mean score indicates that the overall knowledge level among mothers was moderate.

Section D:

Association Between Knowledge Level and Demographic Variables (N = 50)

S. No.	Demographic Variable		df	p-value	Significance
1	Age of Mother	2.14	4	0.71	Not Significant
2	Educational Status	8.21	4	0.04	Significant
3	Occupation	1.96	2	0.37	Not Significant
4	Type of Family	0.88	2	0.64	Not Significant
5	Number of Children	5.02	2	0.08	Not Significant
6	Previous Hospitalization	7.35	2	0.02	Significant
7	Source of Information	1.45	4	0.84	Not Significant
8	Area of Residence	0.69	2	0.70	Not Significant

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Interpretation:

The table shows that there was a statistically significant association between knowledge level and variables such as educational status and previous hospitalization of the child ($p < 0.05$). However, variables such as age of mother, occupation, type of family, number of children, source of information, and area of residence did not show any significant association with the level of knowledge ($p > 0.05$).

Discussion

The present study was conducted to assess the knowledge regarding the use of the kaleidoscope distraction technique in reducing procedural pain among mothers of hospitalized children aged 5–10 years. The findings revealed that the majority of mothers had a moderate level of knowledge (52%), while 32% had inadequate knowledge and only 16% had adequate knowledge. The mean knowledge score (13.84 ± 5.83) also indicates that overall knowledge among mothers was moderate, suggesting partial awareness but the presence of significant knowledge gaps.

The study findings further showed that there was a statistically significant association between knowledge level and selected demographic variables such as educational status and previous hospitalization of the child. This indicates that mothers with better education and prior exposure to hospital settings tend to have better knowledge regarding non-pharmacological pain management techniques. However, variables such as age, occupation, type of family, number of children, source of information, and area of residence did not show any significant association with knowledge level.

The hypothesis H_1 was accepted, as there was a noticeable variation in the level of knowledge among mothers. The hypothesis H_2 was partially accepted, since only some demographic variables showed a significant association with knowledge level.

Overall, the findings emphasize that although mothers possess a moderate level of knowledge, there is a clear need for structured educational interventions and guidance by healthcare professionals. Improving awareness regarding simple, safe, and effective distraction techniques like the kaleidoscope method can enhance procedural pain management and promote better comfort and cooperation among hospitalized children.

Nursing Implications

Nursing Practice: Nurses play a vital role in managing procedural pain among hospitalized children. They should encourage and guide mothers to use simple non-pharmacological techniques such as the kaleidoscope distraction method during painful procedures. By providing proper demonstration and support, nurses can help reduce anxiety, fear, and discomfort in children, thereby improving cooperation during treatment. Strengthening the role of nurses in educating caregivers will enhance the quality of pediatric care and promote child comfort.

Nursing Education: Nursing education should emphasize the importance of non-pharmacological pain management techniques, including distraction methods, in pediatric care. The kaleidoscope distraction technique should be included in the nursing curriculum and clinical training. Workshops, demonstrations, and skill-based training programs should be conducted to improve knowledge and competency among nursing students and staff. This will help in promoting evidence-based practice and improving patient outcomes.

Nursing Administration: Nursing administration should take initiative in organizing regular in-service education programs and workshops for nurses and caregivers regarding effective pain management techniques. Policies and guidelines should be developed to incorporate non-pharmacological interventions as a routine part of pediatric care. Providing adequate resources and supervision will help in ensuring the proper implementation of distraction techniques in clinical settings.

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Nursing Research: Further research can be conducted to evaluate the effectiveness of the kaleidoscope distraction technique in reducing procedural pain among children using experimental designs. Studies with larger sample sizes and in different clinical settings can provide stronger evidence. Comparative studies can also be conducted to assess the effectiveness of various distraction techniques in pediatric pain management.

Conclusion

The present study was conducted to assess the knowledge regarding the use of the kaleidoscope distraction technique in reducing procedural pain among mothers of hospitalized children aged 5–10 years and to determine its association with selected demographic variables. The findings revealed that the majority of mothers had a moderate level of knowledge, while a considerable proportion had inadequate knowledge, indicating the presence of knowledge gaps.

The study also showed that knowledge level was significantly associated with educational status and previous hospitalization of the child, suggesting that education and prior exposure play an important role in improving awareness. However, other demographic variables did not show any significant association with knowledge level.

The results highlight the need for structured educational programs and guidance by healthcare professionals to improve mothers' knowledge regarding non-pharmacological pain management techniques. Enhancing awareness about simple, safe, and cost-effective methods such as the kaleidoscope distraction technique can contribute to better pain management and improved comfort among hospitalized children during procedures.

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

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