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An experimental study to assess the effectiveness of the kaleidoscope in reducing pain during the venipuncture procedure among hospitalized children at selected hospitals of Gurugram, Haryana

Ms. Deepti
M.Sc. Nursing Student, Child Health Nursing Department, Faculty of Nursing, SGT University, Gurugram, Haryana, India
Research Interest: Evidence-based pediatric healthcare

Dr. Khushbu
Associate Professor, Child Health Nursing Department, Faculty of Nursing, SGT University, Gurugram, Haryana, India
Research Interest: Evidence-based pediatric healthcare, innovative nursing technologies

Ms. Rajwant Kaur
Associate Professor, Mental Health Nursing Department, Faculty of Nursing, SGT University, Gurugram, Haryana, India
Research Interest: Mental Health, Women Mental Health, Child abuse

***Abstract*---Background:** Venipuncture is one of the most common invasive procedures in pediatric care, often causing considerable pain and anxiety. Distraction techniques, such as kaleidoscope use, are gaining recognition as effective, safe, and low-cost alternatives to pharmacological pain management. **Objective:** To assess the effectiveness of kaleidoscope distraction in reducing pain during venipuncture among hospitalized children. **Methods:** A quasi-experimental post-test only control group design was conducted in

***Corresponding author**: Deepti, D.; Email: deeptidabas154@gmail.com*
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three hospitals in Gurugram, Haryana. A total of 64 children aged 5–8 years were selected using non-probability purposive sampling, with 32 in the experimental group (kaleidoscope distraction) and 32 in the control group (standard care). Pain was assessed using the Wong-Baker FACES Pain Rating Scale. **Results:** The mean pain score in the experimental group was significantly lower (6.88 ± 1.51) compared to the control group (9.06 ± 1.13), indicating the effectiveness of the kaleidoscope in reducing venipuncture-related pain ($p < 0.05$). A significant association was found between age and pain level in the experimental group ($p = 0.030$). **Conclusion:** Kaleidoscope is an effective non-pharmacological intervention to reduce procedural pain in children. Its simplicity, affordability, and engagement potential make it a valuable addition to pediatric care.

***Keywords*---**Kaleidoscope, Pain, Distraction, Venipuncture, Hospitalized Children, Non-Pharmacological Intervention, Wong-Baker FACES Pain Scale.

Introduction

Venipuncture is a frequently performed invasive procedure in pediatric care, often associated with pain, fear, and anxiety (Mathews, 2011). Despite available pharmacological interventions, their limitations highlight the importance of non-pharmacological alternatives. Distraction techniques such as kaleidoscope use, cartoon videos, and virtual reality have been found effective in reducing procedural pain (Canbulat et al., 2014; Dani & Mathew, 2024; Wong & Choi, 2023). Based on the gate control theory of pain, distraction reduces the perception of pain by engaging children's attention away from the procedure (Wismeijer & Vingerhoets, 2005). Thus, this study was undertaken to evaluate the effectiveness of kaleidoscope distraction in reducing venipuncture pain among hospitalized children.

Methods

This quasi-experimental study adopted a post-test only control group design. It was conducted in three hospitals of Gurugram, Haryana. A total of 64 hospitalized children aged 5–8 years were selected using non-probability purposive sampling. Children were assigned to either the experimental group (n=32, received kaleidoscope distraction) or the control group (n=32, received routine care). Pain levels were measured using the Wong-Baker FACES Pain Rating Scale (Manworren & Stinson, 2016). Descriptive and inferential statistics including mean, standard deviation, and independent t-test were used for data analysis.

Results

The experimental group reported significantly reduced pain scores compared to the control group (mean = 6.88 ± 1.51 vs. 9.06 ± 1.13, $p < 0.05$). In the experimental group, 43.7% of children reported "Hurts Even More" pain, while

40.7% reported “Hurts Whole Lot.” In contrast, in the control group, 23.8% reported the “Hurts Worst” level of pain. Age was significantly associated with pain levels ($p = 0.030$), indicating older children responded better to kaleidoscope distraction.

Discussion

The findings demonstrate the significant effectiveness of kaleidoscope as a distraction technique during venipuncture. This is consistent with previous studies where distraction strategies such as distraction cards, cartoon videos, and virtual reality interventions significantly reduced children’s procedural pain (Koç Özkan & Polat, 2020; Shekhar et al., 2022; Ali et al., 2020). Canbulat et al. (2014) and Tailor & Goswami (2020) specifically demonstrated the efficacy of kaleidoscope distraction in pediatric pain management. Similarly, Bekar et al. (2022) showed its effectiveness in children undergoing central venous catheter dressing changes. These results support the integration of kaleidoscope distraction into routine pediatric nursing practices as a simple, cost-effective, and child-friendly intervention.

Conclusion

Kaleidoscope distraction is a safe, effective, and inexpensive method for reducing venipuncture-related pain in children. It enhances patient cooperation and supports child-friendly, non-pharmacological pain management practices in pediatric nursing. The study recommends incorporating kaleidoscope distraction in routine pediatric venipuncture procedures.

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