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Effectiveness of buzzy technique on pain during intravenous cannulation among children admitted in pediatric ward at MGMCRI, Puducherry

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Abstract

The simple insertion of a needle has been shown to be one of the most frightening and distressing medical procedures for hospitalized children. Buzzy device (Cold and vibration) is one of the non-pharmacologic methods used and acts through local skin desensitisation according to gate-control theory which reduces the pain associated with Intravenous cannulation. Hence, the investigator was interested to do this study to put instant pain management in the hands while performing IV cannulation. The main aim of the study was to determine the effectiveness of Buzzy Technique on pain level during IV cannulation among children.

A Quantitative research approach and randomized controlled trial post test only design was adopted. A total of 60 samples in the age group between 6- 12 years (30 in experimental and 30 in control group), were selected based on inclusion criteria. Children belonging to the experimental group were applied the Buzzy, during IV cannulation, while children in the control group received the routine care. The pain level was assessed by Wong-Baker FACES Pain Rating Scale. Descriptive and inferential statistics were used to analyze the data. Demographic characteristics presents that majority of the children 16 (53.3%) were in the age group of 6- 8 years, 33 were male children, 16 children were studying first standard, most of the children were not previously hospitalized and most of the children did not have any history of previous IV cannulation. Majority of the children 12(40%) in the experimental group stated that it hurts little bit and for none of the children it hurted worst and 10(33.3%) stated worst pain in the control group; The application of Buzzy in the experimental group was found to be effective in reduction of pain, which was statistically significant at $p < 0.001$ level.

Keywords: children, pain, buzzy technique, intravenous cannulation

Introduction

Pain is derived from the Greek word "Peon" meaning suffering and punishment. International Society of Pain described pain as an unpleasant sensory and emotional experience resulting in actual or potential tissue damage or described in terms of such damage. Due to illness and hospitalization, children experience various painful and uncomfortable care. Many children experience IV cannulation as a painful and frightening act, as this procedure is an invasion to the mental, spiritual, and physical medium for the child and involves some harm for the child. This has kindled the interest in managing the pain of children and study related to it as fabricated in recent years. Thus, nurses should be able to manage painful procedures to reduce the physical and emotional effects in children.

Buzzy is a new handled device to help block sharp pain and provide distraction when giving injections to the children. Buzzy was invented by Amy Baxter M.D., Emergency Pediatrician and Pain Researcher. Buzzy is a device designed to numb the skin and "distract the nerves" to "reduce pain on contact. To alleviate pain, Buzzy vibrates and soothes the skin with an "ice wing"— a cold pouch that is frozen and then attached to the Buzzy for use. The vibration and cold distract nearby nerves to reduce pain during an injection, similar to how running cold water over your finger helps a burn. The mechanism of the Buzzy device is based on the gate control theory, whereby cold and vibratory stimulation stimulate large fiber and inhibitory neurons to interrupt nociception. The nerves receive non-painful stimuli like vibration or cold, the brain closes the gate on receiving the pain signals.

Need for the study

Nurses should be aware of the detrimental effects of procedural pain and anxiety in children, by using distraction methods and have appropriate knowledge about different non-pharmacological methods that may reduce their impact. Over 31 million needle procedures have used Buzzy device to block the pain. As like cool running water soothes a burn, Buzzy uses a patented combination of cold and vibration to minimize the pain with temperature and movement. Over 20 independent clinical trials proved Buzzy works!

Buzzy is powered by two alkaline AAA batteries, and can be attached with a standard tourniquet. The Buzzy units come with blue gel ice packs that can be cleaned and reused. While activating, the body of the Buzzy vibrates vigorously and its detachable wings contains a freezable gel which produces a cooling effect. It functions mainly in two ways in order to maximize its ability to take advantage of it. According to the gate control theory of pain, The cold gel numbs the area of needle insertion for about 30–60 seconds. However, by moving the device 3–5 cm proximal to the expected sharp pain allows the vibration to “confuse the nerves and interrupt pain pathways to the brain” and Baxter says, the vibration also dilates nearby veins, making it easier to stick a needle in successfully.

In an emergency department, nurses and doctors can get too busy to wait for numbing creams for needle procedures. Buzzy is developed to put instant pain management in the hands while performing IV cannulation; hence, the researcher was interested to evaluate the effectiveness of Buzzy on reduction of pain among children undergoing intravenous cannulation.

Statement of the problem

“Effectiveness of Buzzy Technique on Pain during Intravenous Cannulation among Children admitted in Pediatric Ward in MGMCRI, Puducherry.”

Objectives

- To assess the level of pain among children during intravenous cannulation.
- To determine the effectiveness of Buzzy Technique on pain level during intravenous cannulation among children.
- To associate the level of pain among children with selected demographic variables.

Materials and Methods

A Quantitative Research Approach and Randomized Controlled Trial Post Test only Research Design was adopted for the study the target population selected for this study included children between the age group of 6– 12 years. The children between the age group of 6– 12 years who helped the inclusion criteria were selected. The sample size for this study was 60 children. (30 Children in the Experimental group and 30 in the Control group). Simple Random Sampling Technique was used to select the samples by using lottery method.

Description of tool

Part I Demographic variables: It consists of 8 items seeking information about the children (age, sex, education,

religion, residential area, diagnosis, previous hospitalization, previous history of IV cannulation)

Part II Wong-baker faces pain rating scale assessment.



Fig 1: Wong-baker FACES pain rating scale assessment

Table 1: Scoring interpretation

S. no	Description	Score	Post test score
1.	No hurt	0	
2.	Hurts little bit	2	
3.	Hurts little more	4	
4.	Hurts even more	6	
5.	Hurts whole lot	8	
6.	Hurts worst	10	

Results

Distribution of demographic variables of children in Experimental group and control group.

The majority of the children 31 (51.7%) were in the age group of 6- 8 years and 29 (48.3%) were in the age group of 9- 12 years. 33(50.0%) were males and 27(45.0%) were females. Majority of children 52(86.7%) were Hindus and 2(3.3%) were Christians. Majority of children 16(26.7%) were studying in first standard and 11 (18.3%) were studying in fifth standard. Most of the children 34(56.7%) had no previous history of hospitalization and 26(43.3%) were hospitalized previously. It reveals that many children 40(66.7%) had no previous history of IV cannulation and 20(33.3%) had previous history of IV cannulation.

Assessment of the level of pain among children during intra venous annulation

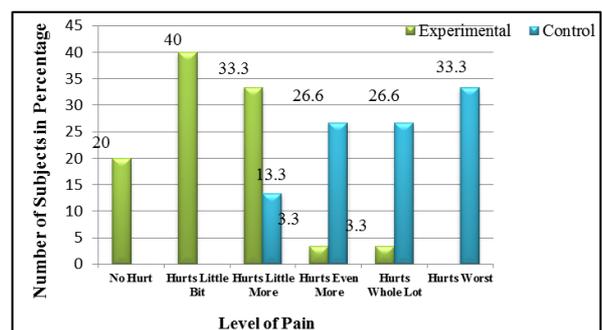


Fig 2: Assessment of the level of pain among children during intra venous annulation

The above figure depicts that out of 30 samples in the experimental group 12 (40.0%) stated that it hurts little bit and for none of the children it hurted worst after applying the Buzzy device during IV Cannulation. In control group out of 30 samples none experienced no hurt and 10(33.3%) stated it hurted worst.

Table 2: Determine the Effectiveness of Buzzy technique on Pain level during Intravenous Cannulation.

Group	Mean + Standard Deviation	Mean differ-ence	Mann Whitney Test	P value
Experimental	2.6 + 1.9	5	6.01	p<0.001
Control	7.6 +2.13			

The above table shows the Mean, Standard deviation, Mean differences and Mann Whitney Test of reduction in pain level among children between the Experimental group and Control group. The mean was of 2.6 with standard deviation of 1.9 in the Experimental group and the mean was 7.6 with a standard deviation of 2.13 in the control group. *The value* obtained by using Mann Whitney Test was 6. 01 which was highly statistically significant at $p<0.001$ level, which implies that the application of Buzzy during IV Cannulation was highly effective in reducing the pain.

Association of pain level among children with selected demographic variables

The study revealed that, with regard to demographic variable there was statistically significant association seen in the variable of residential area and the level of Pain. The obtained χ^2 value was 4.35 and the 'p' value was 0.037. It was significant at $p<0.05$ level. Hence it was inferred that there is significant association between residential area and the level of Pain.

Conclusion

Non- pharmacological methods used for alleviating pain during painful procedure is part of our Nursing care. As Buzzy is found to be highly effective in reducing pain among children, it can be used as an instant pain reliever for Children during IV Cannulation.

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