

Effectiveness of Animated Cartoon Video as a Distraction Strategy on Pain Perception during and after Venipuncture among Preschoolers

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Abstract: **Background:** Venipuncture is a minor invasive procedure, but for children it is also accompanied by pain, fear and anxiety. According to the International Association for the Study of Pain, "Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage". When a child is brought to the hospital, the environment itself makes the child anxious and unsecure. Thus, the investigator intended to conduct a study to assess the effectiveness of animated cartoon video as a distracter to reduce pain during venipuncture among preschoolers. **Objectives:** To show the animated cartoon video to preschoolers prior to venipuncture in the experimental group. 2) To assess the pain by using modified FLACC scale in preschoolers during and after venipuncture in experimental and control group. 3) To evaluate the effectiveness of animated cartoon video in reduction of pain perception by comparing post pain assessment score between experimental and control group. **Method:** The research approach adopted for the study was quantitative evaluative survey approach and the research design used was quasi experimental, non-equivalent, control group posttest only. By using non-probability purposive sampling, 32 preschoolers were selected. 16 in experimental group (Vardhan Child Hospital and Niramaya Hospital, Kolhapur) and 16 in control group (Shri Ram Hospital and Om Sai Child Hospital, Kolhapur). The content validity and reliability of the tool was done, which suggested that the tool was reliable ($r = 0.85$). Pain scores were assessed during and after venipuncture by using modified FLACC scale. Data was tabulated and analyzed using mean, median, mode, range, standard deviation and unpaired *t* test. **Results:** The results of the study revealed that the calculated unpaired '*t*' value ($t_{cal} = 3.81$) is greater than tabulated value ($t_{tab} = 2.04$) during venipuncture and the calculated unpaired '*t*' value ($t_{cal} = 5.06$) is greater than tabulated value ($t_{tab} = 2.04$) after venipuncture. Hence H_1 is accepted. This indicates that there is statistically significant difference between the mean post assessment pain score value of experimental and the control groups. ($p < 0.05$). **Conclusion:** The present study revealed that majority of preschoolers had severe pain during venipuncture which was found to decrease after the intervention of animated cartoon video as a distraction strategy. Thus, the study concluded that animated cartoon video is effective in reducing pain perception among preschoolers.

Keywords: Effectiveness; Distraction strategy; Pain perception; Venipuncture; Animated cartoon video

1. Introduction

Children are the most innocent and pure of the heart. They do whatever comes in their mind. Health of the children has been considered vital to all societies, as they are the future of humankind.

We see in our day today life, children are getting admitted in clinics and hospitals. Often illness and hospitalization are the first crisis that children encounter. Children's way of reacting to this crisis depends on the age and previous experience of hospitalization.¹

Venipuncture is one of the most commonly experienced procedures by children and 36 – 64 % of children from 3 to 6 years old, experience significant level of distress during venipuncture.²

According to the International Association for the Study of Pain, "Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage". Perception of pain in pediatrics, is complex and entails physiological, psychological, behavioral, and developmental factors.³

Melzack and Wall proposed the Gate Control Theory, which suggests that factors such as the level of attention paid to the pain, the emotion associated with the pain and past experience of the pain, play a role in how the pain will be interpreted.⁴

Pains are often treated in children by using appropriate pain management technique. Children cannot express pain in words, but they do express with their facial expression, activities and behaviors. The most convenient pain scale for children is FLACC scale (Face Legs Activity Cry Consolability).⁵

The investigator's personal experience was that, children bear significant pain and depict discomfort during venipuncture in hospitals. This, motivated the researcher to conduct a study to evaluate the effectiveness of animated cartoon video as distraction strategy to reduce pain in children.

2. Material & Methods

A Quasi-Experimental, Non-Equivalent control group post test design was adopted for the present study. Prior to the data collection, permission was obtained from the authorities of the selected hospitals Kolhapur. Written assent was obtained from the parents of the preschoolers after explaining the purposes and objectives. Preschoolers were

selected by using non probability purposive sampling technique and those who fulfilled the criteria of selective hospitals taken as (16) experimental and (16) control. Animated cartoon video was showed to the preschoolers in the experimental group, five minutes prior to the procedure and it was shown throughout the venipuncture procedure. No animated cartoon video was shown to the control group. Pain score of preschoolers during and two minutes after venipuncture was assessed using modified FLACC scale for both experimental group and for control group.

3. Findings & Discussion

The major findings of the study were discussed under the following sections:

- 1) Finding related to socio-demographic variables of preschoolers undergoing venipuncture procedure.
- 2) Finding related to pain scores in experimental and control group.
- 3) Finding related to effectiveness of animated cartoon video in reduction of pain perception by comparing post pain assessment score between experimental and control group.

Section I: Finding related to socio-demographic variables of preschoolers undergoing venipuncture procedure.

Table 1: Frequency and percentage (%) distribution of preschoolers in experimental and control group according to socio-demographic variables. (n = 32)

Sr. No	Socio-demographic variables	Exp. Group		Control Group		Total	
		(f)	(%)	(f)	(%)	(f)	(%)
1. Age in years							
a) 3 – 4		10	62.5	7	43.8	17	53.1
b) 5 – 6		6	37.5	9	56.2	15	46.9
2. Gender							
a) Male		10	62.5	9	56.2	19	53.9
b) Female		6	37.5	7	43.8	13	40.7
3. Type of family							
a) Nuclear family		11	68.8	6	37.5	17	53.1
b) Joint family		5	31.2	10	62.5	15	46.9
4. Habitat							
a) Rural		12	75	9	56.2	21	65.7
b) Urban		4	25	7	43.8	11	34.3
5. Number of siblings							
a) None		6	37.6	4	25	10	31.2
b) One		9	56.2	12	75	21	65.7
c) Two		1	6.2	0	0	1	3.1
6. Family member present during the venipuncture procedure							
a) If yes,							
i. Mother		0	0	2	12.5	2	6.2
b) No		16	100	14	87.5	30	93.8
7. Occupation of mother							
House wife		14	87.6	13	81.2	27	84.4
Skilled labor		1	6.2	2	12.6	3	9.4
Professional		1	6.2	1	6.2	2	6.2
8. Past history of hospitalization							
Yes, how many Times							
Once		7	43.8	8	50	15	46.9
No		9	56.2	8	50	17	53.1

9. Previous experience of venipuncture							
	None	10	62.5	4	25	14	43.8
	b) Once	6	37.5	11	68.8	17	53.9
	c) Twice	0	0	1	6.2	1	3.1
10. Site of venipuncture							
	a) Upper extremity	16	100	16	100	32	100
11. Size of needle							
	a) 22G	5	31.2	10	62.5	15	46.9
	b) 24G	11	68.8	6	37.5	17	53.1
12. Number of attempts							
	a) Once	14	87.5	13	81.2	27	84.3
	b) Twice	2	12.5	2	12.6	4	12.6
	c) More than three	0	0	1	6.2	1	3.1

Table 1: Revealed that,

- Majority of preschoolers 10 (62.5%) in experimental group belonged to age group of 3 - 4 years whereas maximum 9 (56.25%) of preschoolers in control group belonged to age group of 5 – 6 years.
- Majority of preschoolers 10 (62.5%) in experimental group and 9(56.25%) in control group were males.
- Majority of the families in experimental group 11(68.75%) were nuclear families and on the other hand maximum 10 (62.5%) were belonged to joint families in control group.
- Majority of preschoolers 12(75%) in experimental group and maximum 9 (56.25%) in control group resided in rural areas.
- Maximum number of preschoolers 9(56.25%) in experimental group and 12(75%) in control group had one sibling.
- None of the family member 16(100%) in experimental group and 14(87.5%) in control group were present during the venipuncture.
- Majority of mothers 14(87.5%) in experimental group and 13(81.25%) in control group were housewife.
- Majority 9(56.25%) of the preschoolers in experimental group and 8(50%) in control group had no past history of hospitalization.
- Maximum number of preschoolers 10(62.5%) in experimental group had no previous experience of venipuncture whereas in control group majority 11(68.75%) had the experience of venipuncture once.
- All the preschoolers in both experimental and control groups 32(100%) had underwent venipuncture in upper extremities.
- Majority of preschoolers 11(68.75%) in experimental group had venipuncture with 24G needle and maximum 10(62.5%) had venipuncture with 22G needle in control group.
- Maximum number of preschoolers 14 (87.5%) in experimental group and 13(81.25%) in control group underwent venipuncture once.

Section II. Finding related to pain scores in experimental and control group.

Table 2: Frequency and percentage (%) distribution of pain scores in experimental and control group during venipuncture (n= 32)

Pain Scores	Exp. group		Control group	
	(f)	(%)	(f)	(%)
Relaxed and comfortable 0	0	0	0	0
Mild 1 - 3	1	6.25	0	0
Moderate 4 - 6	9	56.25	2	12.5
Severe 7 - 10	6	37.5	14	87.5

Table 2: Revealed that, majority of preschoolers in experimental group 9(56.25%) had moderate pain and one preschooler 1(12.5%) showed mild pain whereas in control group majority of preschoolers 14(87.5%) had severe pain and 2(12.5%) had moderate pain.

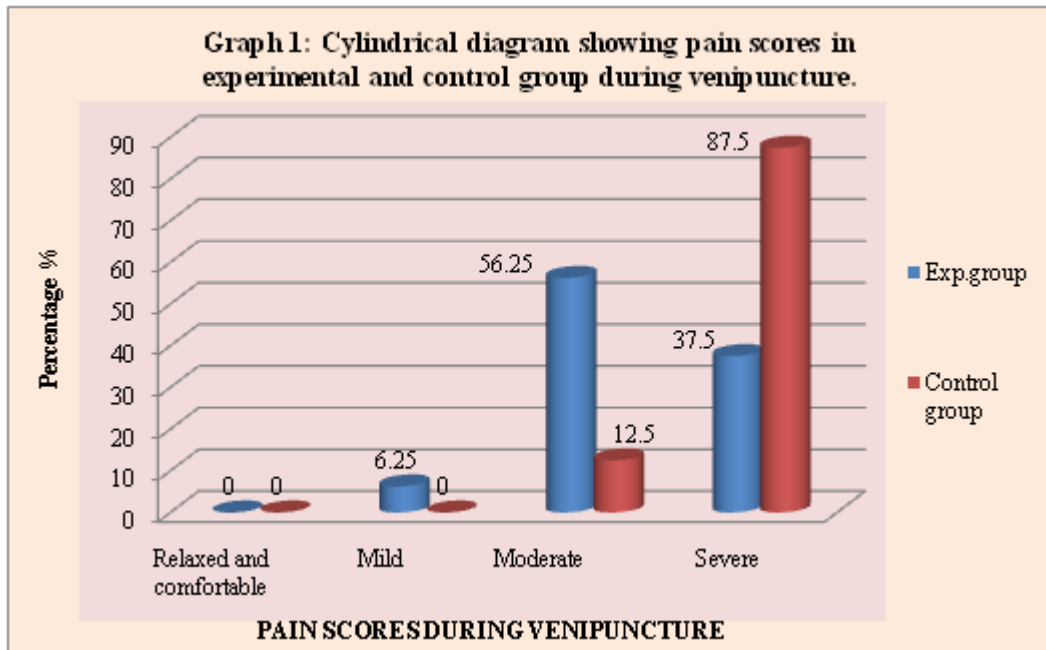


Table3: Frequency and percentage (%) distribution of pain scores in experimental and control group after 2 minutes of venipuncture. (n = 32)

Pain Scores	Exp.group		Control group	
	(f)	(%)	(f)	(%)
Relaxed and comfortable 0	4	25	0	0
Mild 1 - 3	8	50	14	87.5
Moderate 4 - 6	4	25	2	12.5
Severe 7 - 10	0	0	0	0

Table 3: Revealed that, majority of preschoolers in experimental group 8(50 %) had mild pain and 4 (25%) were relaxed and comfortable while 4(25%) had moderate pain. In control group majority of preschoolers 14(87.5%) had mild pain whereas 2(12.5%) had moderate pain.

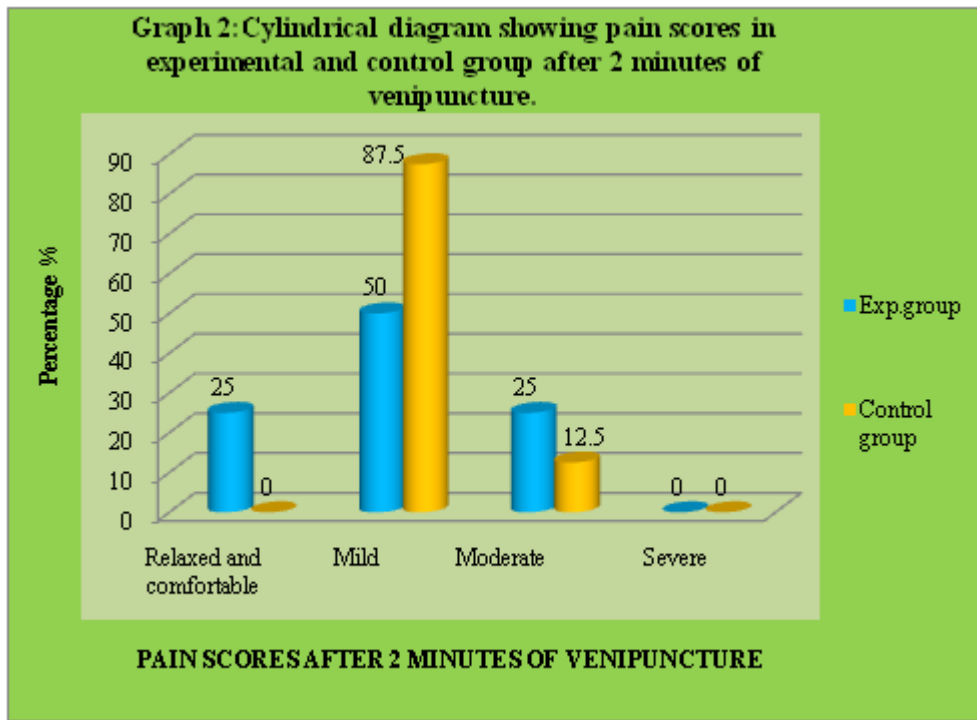


Table 4: Mean, median, mode, range and standard deviation of pain scores in experimental and control group during venipuncture. (n = 32)

Area of analysis	Mean	Median	Mode	Range	SD
Exp. Group (x)	5.75	5.5	4	6	1.85
Control group (y)	8.06	8	9	6	1.56
Difference (x - y)	2.31	2.5	5	0	0.29

Table 4: Indicated that, during venipuncture, the overall pain score of preschoolers in the experimental group was less than the control group by mean difference 2.31 units and median was 2.5units where mode was 5units. The variability around the mean of pain score distribution was higher by 0.29 units in experimental group and the range of between the highest and lowest score remained 0 unit after the intervention.

Table 5: Mean, median, mode, range and standard deviation of pain scores of experimental and control group after 2 minutes of venipuncture. (n = 32)

Area of analysis	Mean	Median	Mode	Range	SD
Exp. Group (x)	1.93	2	0	5	1.59
Control group (y)	4.31	4	4	4	0.98
Difference (x - y)	6.25	2	4	1	0.61

Table 5: Indicated that, after 2mins of venipuncture, the overall pain score of preschoolers in the experimental group was less than the control group by mean difference 6.25units and median was 2units whereas mode was 4units. The variability around the mean of pain score distribution was higher by 0.61 units in experimental group and the range between the highest and lowest score was higher by 1 after the intervention..

Similar finding were reported in the study done by Baljit Kaur1, Jyoti Sarin and Yogesh Kumar on effectiveness of cartoon distraction on pain perception and distress in children during intravenous injection. Their study revealed

that the mean distress score of children without cartoon distraction at initiation (15.00, 14.87), at five minute (14.13, 13.73) and at termination (12.37, 12.17) of intravenous injection were higher than the mean distress score of children with cartoon distraction at initiation (6.80, 6.65), at five minute (5.77, 5.50) and at termination (3.87, 4.50) of intravenous injection on day 1 and day 2 respectively. It further showed that t value calculated between mean distress score of children with and without cartoon distraction at initiation (t (29)=11.57, 17.80), at five minute (t (29)=12.61, 19.48) as well as at termination (t (29)=13.57, 14.39) of administration of intravenous injection were found to be statistically significant at 0.05 level of significance.⁶

Section III. Finding related to effectiveness of animated cartoon video in reduction of pain perception by comparing post pain assessment score between experimental and control group.

Table 5: Mean difference, Standard error (SE) and Unpaired 't' values of pain scores of preschoolers in experimental and control group during and after 2 minutes venipuncture. (n = 32)

Area of analysis	Mean difference	Standard error difference (SED)	Unpaired 't' values	
			Calculated	Tabulated value
During venipuncture	1.15	0.29	3.81	2.04
After 2 minutes of venipuncture	1.18	0.26	5.06	2.04

Table 5. Revealed that, the calculated unpaired 't' value ($t_{cal} = 3.81$) is greater than tabulated 't' value ($t_{tab} = 2.04$) during venipuncture and the calculated unpaired 't' value ($t_{cal} = 5.06$) is greater than tabulated 't' value ($t_{tab} = 2.04$) after venipuncture .This indicates that there is statistically significant difference between the mean post assessment

pain score value of experimental and the control groups. ($p < 0.05$).

The finding of this study were supported by the study done by Ms. Melba Roshini Lobo in Mangalore on effectiveness of cartoon distraction reduces venipuncture pain among preschoolers. The present study showed that the mean post test score of the experimental group(5.9) is lesser than the mean post test score (8.7) of the control group. The independent 't' value computed between the pain score of preschoolers in experimental and control group was statistically significant at 0.05 level of significance. The calculated 't' value ($t=7.3$) was greater than the table 't' value ($t=1.66$). This indicates that the cartoon distraction was effective on pain during venipuncture in preschoolers.⁷

4. Conclusion

Hence, it is proved that animated cartoon video is effective as a distraction strategy on pain perception among preschoolers. These findings will be helpful in areas of Nursing Education, Nursing Practice, Nursing Administration and Nursing Research.

5. Recommendations

- 1) Similar study can be conducted in future regarding the analgesic effect of animation as a distraction strategy on pain perception during other painful procedures.
- 2) Further researches can be conducted by taking other non-pharmacological strategies (like imagery, blowing bubbles, music therapy, playing video game, etc.) as an intervention to reduce the pain perception among children.
- 3) Similar study on a large setting with more samples for a longer period of time would be pertinent in making broad generalization of the findings.
- 4) Comparative study can be conducted in different settings.
- 5) Randomized controlled trial can be done on the same research study where there is large setting and more samples.

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7. Conflict of Interest

None

8. Source of Funding

Self

9. Ethical Clearance

Permission received from D.Y.Patil Deemed University, Kolhapur.

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