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Original Research Article

Effectiveness of Animated Cartoon as a Distraction Strategy on Level of Pain among Children Undergoing Venipuncture at Selected Hospital

Susan Maharjan[1], Bhima Uma Maheswari[2], Manju Maharjan[3]

[1]Lecturer (Child health Nursing, Lalitpur Nursing Campus),
[2]Professor (Department of Child Health Nursing, Padmashree Institute of Nursing),
[3]Research Officer (CREHPA)

Corresponding Author: Susan Maharjan

ABSTRACT

Background: Venipuncture is an invasive procedure and for children it is generally accompany by fear. Distraction technique is one of the non-pharmacological methods of controlling pain and different distraction techniques have been used to alleviate pain. This study aims to assess the effectiveness of animated cartoon as a distraction strategy on level of pain among children undergoing venipuncture.
Method and Material: Quasi-experimental study was conducted among children of 4-6 years who were undergoing venipuncture in selected hospital. The study comprised of 60 children selected purposively- 30 in each experimental and control group. Animated cartoon was shown along with routine care for the experimental group and only routine care was provided to control group. The post venipuncture pain was assessed by using FLACC scale in both groups.
Results: Finding showed that in post test, majority of the subjects 56.7% in the experimental group had pain score between 4-6 (moderate pain) and 43.3% had score (7-10) severe pain and in control group all children had pain score (7-10) severe pain. With regard to pain in experimental group, post test pain mean±SD was 6.63 ± 0.80. In control group post test pain mean±SD was 9.43±0.62. The findings showed that significantly less pain ($p<0.05$) felt by the children who viewed animated cartoon during venipuncture than those who did not receive it.
Conclusion: This study concluded that distraction is an effective technique for the children undergoing venipuncture in order to alleviate pain level.

Key words: Animated cartoon, pain, children, FLACC scale

INTRODUCTION

Pain is a subjective experience with cognitive, behavioral, and emotional dimensions which is affected by environmental, socio-cultural and evolutionary factors of an individual. [1]

Deutsch described that any rupture of the skin surface or entry into the body as an invasive procedure. In childhood venipunture is considered as unpleasant medical invasive procedures which are understood to be puncturing the vein with an injection needle. [2] Repeated venipuncture is an especially stressful and painful experience for children. Venipuncture involving rough treatment, poor preparation or unbearable pain can have extensive effects that include anxiety, decreased pain threshold, and reduced effects of analgesia for further procedures and avoidance of medical care. [3] In case of failure to use appropriate strategies to

alleviate pain, venipuncture has been reported as one of the largest sources of pain among children. [4]

It is reported that anxiety in children can increase their subjective perception of pain. However, it can be reduced if their attention is focused on a pleasant activity. [5] Distraction techniques are often provided by service providers, parents or child life specialists and help in pain alleviation during procedures. [6] Distraction is a non-pharmacological intervention aimed to reduce procedural pain in children. Distraction is one of the pain control techniques utilizing five senses in order to focus the patient's attention on other stimuli and hence control pain in a better way. [7] Some of the various methods of distraction used to reduce pain in children include handheld video games, audio-visual systems, bubble maker tools and mobile toys, listening to music and therapeutic touch. [8-11]

The distraction appears to offer significant promise in the control of pain. Conscious attention is necessary to experience pain. Distraction helps the child to focus attention on something other than the pain. Distraction technique that are more likely to be effective because, they provoke curiosity in children to use their auditory, visual, tactile and kinesthetic sense when maneuvering them and thus distraction effectively minimizes the distress associated with painful event. All the distracting techniques such as progressive muscle relaxation, breathing technique, simple imagery toys, videogames, animated cartoon, party blowers and music help the child to keep away from thinking of their pain. Distraction techniques seek to focus a child's attention on interesting or challenging tasks to avert the attention from painful or distress medical procedures. [12]

The reticular activating system inhibits painful stimuli when a child receives sufficient or excessive sensory input like distraction. With a meaningful sensory stimulus, one can ignore or become unaware of pain. Distraction which is pleasurable stimuli causes the release of endorphins, the natural opioid neuro modulators present in the brain and spinal cord. This modulator binds to specific opioid receptor sites throughout the central nervous system, blocks the release or production of pain transmitting substances and thereby modulates the pain perception. [13]

Distraction techniques are often provided by service providers, parents or child life specialists and help in pain alleviation during invasive procedures. The use of non pharmacological procedures is economical. Perception of pain in pediatrics is complex, and entails physiological, psychological, behavioral and developmental factors. However, in spite of its frequency, pain in infants, children and adolescents is often underestimated and under treated. [14] Despite these facts, emphasis on the assessment and management of pain in the children is lacking. In the light of above observations the present study was undertaken with the aim to assess the effectiveness of animated cartoon as a distraction strategy on level of pain among children undergoing venipuncture.

MATERIALS AND METHODS

Quasi-experimental control group post-test only design [15] was adopted for the study. After getting approval of institution ethics committee and written consent from the parents of the children after explaining the purposes and objectives data was collected.

The study was conducted among children of ages of 4 to 6 years undergoing venipuncture admitted in paediatric ward of Vani Villas Hospital, Bangalore. Children who were in emergency critical care, visual and auditory impairment and who were not permitted by parents were excluded from the study. A sample of 60 children who have been selected from population was grouped into 2 groups. Non probability purposive sampling technique was adopted in selecting samples.

Animated cartoon video was showed to the experimental group and it was shown throughout the venipuncture procedure. No animated cartoon video was shown to the control group. The post venipuncture pain was assessed by using FLACC scale in both groups.

FLACC Scale includes five categories of pain behavior, including facial expression, leg movement, activity, cry, consolability. Interpretation of FLACC scale score: 0 "no pain", 1-3 "mild pain", 4-6 "moderate pain", 7-10 "severe pain". Reliability of the tool to assess the level of pain was established through inter-rater method where r = 0.98 and the tool was found to be reliable. The outcome was level of pain among the children undergoing venipuncture. The determinants were age, gender, class studying, religions, and monthly family income, history of previous hospitalization, experience of venipuncture and site of venipuncture.

Statistical analysis

Completed questionnaires were coded and spreadsheets were created for data entry. The data was analysed using SPSS 20. A preliminary statistical analysis involved examining the frequency distribution of determinants, mean and standard deviation. Mann-Whitney U test was used to compare the post test mean level of pain among children undergoing venipuncture between the experimental group and control group.

RESULTS

Table 1 depicted that in experimental groups; half of the children belong to age group 5 years and very less 6(20%) children belongs to age group 4 years. Similarly, in control group, majority of children 12(40%) belong to age group 4 years. Whereas 9(30%) belongs to each 4 and 6 years age group. Regarding the gender, in the experimental group 18(60%) of children were males and 12(40%) were females. Likewise, in the control group, 21(70%) of children were males and 9(30%) were females. In the experimental group, 18(60%) children belong to Hindu, 12(40%) belong to other religion. In the control group, 19(63%) children belong to Hindu, 11(37%) children belong to other. In reference to class studying, in the experimental group, majority 17(57%) were studying in L.K.G, 7(23%) were studying in nursery and 6(20%) were studying in U.K.G. In the control group, 13(43%) were studying in nursery, 11(37%) were from L.K.G and 6(20%) were from U.K.G. In the context to family income per month, in experimental group, 19(63%) had income less than Rs. 5000 and 11(37%) had income ranging from Rs. 5000- Rs. 10000. In the control group, 18(60%) had income less than Rs. 5000 and 12(40%) had income ranging from Rs. 5000- Rs. 10000. In reference to previous hospitalization, in the experimental group, 24(80%) had no history of hospitalization and 6(20%) had history of hospitalization and in control group, 26(87%) had no history of hospitalization and 4(13%) had history of hospitalization. Regarding experience of venipuncture, in experimental group, 26(87%) had no experience of venipuncture and 4(13%) had experience of venipuncture. In control group, 27(90%) had no experience of venipuncture and 3(10%) had experience of hospitalization. In reference to site of vein puncture, in experimental group, majority 25(83%) got venipuncture at radial and 5(17%) got venipuncture at brachial and in control group, 27(90%) got venipuncture at radial and 3(10%) got venipuncture at brachial.

The Table 2 depicted that in the post test in the experimental group, majority of the subjects 17(57) had pain score between 4-6(moderate pain) and 13(43%) had score (7-10) severe pain. In control group, all the subjects 30(100%) had pain score (7-10) severe pain.

Table 1 Frequency and percentage distribution of children undergoing venipuncture according to their demographic variables

SN	Variables	Experimental n=30 (n %)	Control n=30 (n %)
1	Age (in years)		
	4 yrs	6 (20)	9 (30)
	5 yrs	15 (50)	12 (40)
	6 yrs	9 (30)	9 (30)
2	Gender		
	Male	18 (60)	21 (70)
	Female	12 (40)	9 (30)
3	Religion		
	Hindu	18 (60)	19 (63)
	Other	12 (40)	11 (37)
4	Education		
	Nursery	7 (23)	13 (43)
	LKG	17 (57)	11 (37)
	UKG	6 (20)	6 (20)
5	Family income per month in Rs		
	Below 5000	19 (63)	18 (60)
	5000-10000	11 (37)	12 (40)
6	Previous hospitalization		
	Yes	6 (20)	4 (13)
	No	24 (80)	26 (87)
7	Experience of venipuncture		
	Yes	4 (13)	3 (10)
	No	26 (87)	27 (90)
8	Site of venipuncture		
	Radial	25 (83)	27 (90)
	Brachial	5 (17)	3 (10)

Table 2 Frequency and percentage distribution of children undergoing venipuncture according to post test level of pain in both experimental and control group

SN	Level of pain	After distraction therapy	
		Experimental n=30	Control n=30
		n(%)	n(%)
1	No pain (0)	-	-
2	Mild pain (1-3)	-	-
3	Moderate pain (4-6)	17 (57)	-
4	Severe pain (7-10)	13 (43)	30 (100)

The table 3 depicted that in the experimental group, the overall range in post test was between 6-8, mean±SD was 6.63 ± 0.80 and in the control group, the overall range in post test was between 8-10, mean±SD was 9.43±0.62. Since the score are ordinal and comparison between two groups Mann-Whitney U test was used equivalent Non-parametric test for unpaired T test.

The Mann- Whitney U test value was 6.74 which were statistically significant at p-value <0.05 in the level of pain among children undergoing venipuncture after animated cartoon between experimental and control group.

Table 3 Mean±SD, range and Mann –Whitney U test analysis of post test level of pain among children undergoing venipuncture in between experimental and control group

SN	Groups	Max. score	Post test pain				Mann – Whiteny U test	p-value
			Range	Mean	SD	Mean %	Z-value	
1	Experimental	10	6-8	6.63	0.8	66.3	6.74*	p<0.05
2	Control	10	8-10	9.43	0.62	94.3		

DISCUSSION

The findings of this study are well supported by other studies findings conducted in western countries. Distraction has been shown to minimize fear, anxiety and pain associated with acute painful medical procedures in children. [16] Distraction is one of the non-pharmacological techniques of pain management strategies. Among distraction therapies, watching animated cartoon helps children to focus their attention to other stimuli which can be effective intervention to reduce pain of the venipuncture. [12,17]

CONCLUSION

This study assessed the effectiveness of animated cartoon on level of pain among children undergoing venipuncture. The samples were allotted to two groups-

experimental and control with 30 samples each. The samples in the experimental group received the intervention of animated cartoon during venipuncture and samples in control group received no intervention. Level of pain experienced by children undergoing venipuncture was measured by FLACC pain scale score. The results showed post test level of pain among children undergoing venipuncture in between experimental and control group is significantly difference which supported that animated cartoon is effective on the alleviating level of pain among children undergoing venipuncture. Hence, this study concluded that distraction is an effective technique for the children undergoing venipuncture in order to alleviate pain level.

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