

Comparison between the Analgesic Effect of two Techniques on the Level of Pain Perception During venipuncture in Children up to 7 Years of Age: A Quasi-Experimental Study

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ABSTRACT

Background: Distraction techniques are often provided by nurses, parents or child life specialists and help in pain alleviation during procedures. The use of non pharmacological procedures to cope with pain behaviour is less costly and most of these procedures can be administered by a nurse. Hence, the aim of the present study was to assess and compare the analgesic effect of holding the child by a family member versus holding the child by a family member along with an animation distraction intervention on the level of pain perception during venipuncture in children up to seven years of age.

Materials and Methods: Purposive sampling technique was used to select 70 children admitted in paediatric ward of Guru Gobind Singh Medical Hospital, Faridkot, 35 children in each group viz. Group 1 (child held by family member during venipuncture) and Group 2 (child held by family member along with an animation distraction during venipuncture) and video clippings were made for each subject in both groups. Standardized FLACC pain

scale was used to assess the level of pain during venipuncture by seeing the video clips of procedure in both groups.

Results: Findings revealed that the mean pain score of Group 1 was 3.86 and that of Group 2 was 2.43. Findings revealed that in Group 1 majority 31(88.57%) got severe pain and none remained relaxed during venipuncture whereas in Group 2 majority 10(28.58%) got moderate pain, 09(25.71%) remained relaxed and only 07(20%) got severe pain. The comparison of mean pain score of both groups was checked statistically by computing independent t-test and the value of t comes out to be 7.199 with p-value 0.000*** which was found to be highly significant.

Conclusion: The study concluded that when during painful procedures like venipuncture if children are given any non-pharmacological intervention like animated distraction along with their family member it helps in managing the pain. In other words, it distracts/diverts the child's attention from pain and results in better cooperation of child during procedure.

Keywords: Animation distraction Intervention, Children, Family member, Pain, Venipuncture

INTRODUCTION

According to the International Association for the Study of Pain, Pain is defined as, "an unpleasant sensory and emotional experience associated with actual or potential tissue damage" [1].

Perception of pain in paediatrics 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.

It has also been shown that infants and children, who experience pain in early life, show long-term changes in terms of pain perception and related behaviours. Health care professionals in this setting have a responsibility to reduce pain and anxiety as much as possible while maintaining patient safety [2].

Pain in infants and children is difficult to assess which has led to the creation of numerous age-specific pain management tools and scores. Health care workers need to be able to detect the symptoms and signs of pain in different age groups and determine whether these symptoms are caused by pain or other factors [3].

Increasing evidences has demonstrated that pain from intravenous cannulation is an important source of paediatric pain and has a lasting impact. Elimination or relief of pain and suffering, whenever possible, is an important responsibility of physicians caring for children, because unmanaged pain can result in a variety of negative

long term consequences. Increasing evidences has demonstrated that venous access procedures are an important source of paediatric pain that should be managed [4].

The prevention of pain in children is not only an ethical obligation, but it also averts immediate and long-term adverse consequences. For paediatric patients presenting to the emergency department, medical procedures are often painful, unexpected, and heightened by situational stress and anxiety leading to an overall unpleasant experience [5].

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 and compare the analgesic effect of holding the child by a family member versus holding the child by a family member along with an animation distraction intervention on the level of pain perception during venipuncture in children up to seven years of age. It was hypothesized that analgesic effect of holding the child by a family member along with an animation distraction intervention is more effective than holding the child by a family member alone in managing pain in children up to seven years of age during venipuncture.

MATERIALS AND METHODS

Study was conducted in Paediatric ward of Guru Gobind Singh Medical Hospital, Faridkot, India. Experimental approach and Quasi-

POPULATION: Target population- Children of age one year to 7 years undergoing venipuncture admitted in paediatric ward of Guru Gobind Singh Medical Hospital, Faridkot.

STUDY SAMPLE: Out of 112 subjects 42 were excluded. Final sample N = 70
 • 35 children held by family member during venipuncture.
 • 35 children held by family member along with animation distraction during venipuncture.
SAMPLING TECHNIQUE: Non- randomized Purposive sampling

VARIABLES UNDER STUDY:	
DEPENDENT VARIABLES : • Pain level/severity of pain	INDEPENDENT VARIABLE: • Family member • Animation distraction intervention

CRITERION MEASURES : Level of Pain perception measured by FLACC pain scale.

- Face
- Leg
- Activity
- Cry
- Consolability

OUTCOME: There will be less or no pain perception during venipuncture with intervention

[Table/Fig-1]: Schematic presentation of research design

experimental research design was used for assessing the analgesic effect. Non randomized purposive sampling technique was used to select 70 children and the groups were assigned (35 children in each group) to assess analgesic effect.

CRITERION FOR SELECTION OF STUDY SUBJECTS

Inclusion criteria

- Child should be conscious (i.e. able to respond to painful stimuli).
- Child should be admitted in paediatric ward of Guru Gobind Singh Medical hospital, Faridkot.
- Child should not be under effect of any sedative/anticonvulsant/analgesic drug.
- Child should be accompanied by a family member.

Exclusion criteria

- Unconscious child.
- Child under effect of any sedative/anticonvulsant/analgesic drug.
- Child who has received recent vein prick or undergone any painful procedure.
- Child who was not accompanied by a family member (held by other than family member).

A total of 112 subjects up to seven years of age were examined from November 2013 to January 2014. Total 70 subjects were fulfilled the selection criteria. This will forms the finale sample of 70 subjects which were later assigned in to two groups (35 children in each group) to assess analgesic effect.

Demographic data was collected by interview schedule and standardized FLACC (Face, Leg, Activity, Cry and Consolability) pain scale was used for assessing the level of pain in children undergoing

S. no	Variable	Group 1 (child held by family member) n=35		Group 2 (child held by family member along with an animation distraction) n=35	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
1	Age (in years)				
	1-3	10	28.57	10	28.57
	>3-5	12	34.29	12	34.29
	>5-7	13	37.14	13	37.14
2	Gender				
	Male	20	57.14	22	62.86
	Female	15	42.86	13	37.14
3	Reason for venipuncture				
	Taking blood sample	16	45.71	15	42.86
	Inserting cannula	19	54.29	20	57.14
	Giving medication	00	00.00	00	00.00
4	Relation of the family member				
	Mother	20	57.14	19	54.29
	Father	12	34.29	08	22.86
	Grandmother	02	5.71	05	14.28
	Grandfather	01	2.86	03	8.57

[Table/Fig-2]: Distribution of study subjects by selected socio demographic variables

Pain level/severity of pain	Frequency (n)	Percentage (%)
Relaxed	00	00
Mild pain	01	2.86
Moderate pain	03	8.57
Severe pain	31	88.57

[Table/Fig-3]: Analgesic effect of holding the child by family member on level of pain during venipuncture (n=35)

Pain level/severity of pain	Frequency (n)	Percentage (%)
Relaxed	09	25.71
Mild pain	09	25.71
Moderate pain	10	28.58
Severe pain	07	20.00

[Table/Fig-4]: Analgesic effect of holding the child by family member along with an animation distraction on level of pain during venipuncture (n=35)

venipuncture [Table/Fig-1]. Reliability of tool was estimated by inter-rater reliability method. The Kappa value for FLACC Pain Scale Score was found to be 0.97. To see all the parameters of the pain scale properly video recording of the procedure was done using Sony cyber shot camera in both groups.

Interpretation of scores of FLACC Pain scale

- 0 = relaxed and comfortable.
- 1-3 = mild discomfort.
- 4-6 = moderate pain.
- 7-10 = severe discomfort/ pain.

As the study participants were small children who like rhymes so animation shown to them was of rhymes. Video clipping was of 07min and 23s duration. It was showed on Lenovo S100 notebook. Video clipping was showed to children in group 2 (i.e. child held by family member along with an animation distraction) from initiation

Group1 (child held by family member) n=35		Group 2 (child held by family member along with an animation distraction) n=35		T Value	P Value
Mean	S D	Mean	S D		
3.86	.430	2.43	1.092	7.199	<0.0001***

Statistical test applied: independent sample t-test
***Highly Significant at 0.05 level df = 68

[Table/Fig-5]: Comparison of analgesic effect of holding the child by family member versus holding the child by a family member along with an animation distraction on level of pain during venipuncture (n=70)

of venipuncture till the procedure ends up. The time spent on each subject during both groups viz. group 1 (i.e. child held by family member alone) and group 2 (i.e. child held by family member along with an animation distraction) was 2-5 min. Video recording was done for both groups.

Ethical Consideration and informed consent

Study approval was taken from ethical committee of the University College of Nursing, Faridkot. Keeping in mind the legal rights of the study subjects, only those who were willing to participate and allowed videotaping were included in the study. Written informed consent was taken from family member of each study subject after explaining them about study, its objectives and its benefits. Confidentiality was maintained throughout the study.

STATISTICAL ANALYSIS

Completed questionnaires were coded and spreadsheets were created for data entry. The data was analysed using SPSS 15 (SPSS Inc. Chicago, IL, USA) Windows software program. Descriptive statistics were used to summarize the information and the data was analysed using the independent sample t-test.

RESULTS

[Table/Fig-2] Depicted that majority of study subjects 13 (37.14%) belong to age group >5-7 y, and very less 10(28.57 %) subjects belong to age group 1-3 y, and 12(34.29%) belong to >3-5 y age group. In the group 1 20(57.14%) children were male and 15(42.86%) were females. Whereas in group 2, 22(62.86%) children were males and only 13(37.14%) were females. In the group 1 majority of venipuncture 19(54.29%) done to insert cannula, 16(45.71%) done for taking blood sample and in group 2 majority of venipuncture 20(57.14%) done to insert cannula, 15(42.86%) done for taking blood sample whereas in both groups no children undergone venipuncture for giving medication. In group 1 majority of study subjects 20(57.14 %) were held by their mothers, 12(34.29%) by their fathers, 02(5.71%) by their grandmother and only 01(2.86%) by their grandfather during venipuncture similarly in group 2 majority of study subjects 19(54.29%) were held by their mothers, 08(14.28%) by their fathers, 05(14.28%) by their grandmother and only 03(8.57%) by their grandfather during venipuncture. The description shows that the study sample in both groups i.e. group 1 and group 2 were homogenous in nature and there will be no statistical variation in demographic variables of both groups.

[Table/Fig-3] shows that majority of the child felt severe pain and none remained relaxed when held by family member during venipuncture.

[Table/Fig-4] depicted that majority of the child felt moderate pain when held by family member along with animation distraction during venipuncture.

[Table/Fig-5] illustrates that mean pain score in group 1(i.e. child held by a family member) was 3.86 and in group 2 (i.e. child held

by a family member along with an animation distraction) was 2.43 and t-value was 7.199 which was statistically highly significant at p-value < 0.05.

DISCUSSION

The findings of present study revealed that the venipuncture procedure causes severe level of pain expressed by FLACC pain scale scores.

The present study depicts that there is less perception of pain in children during venipuncture who were held by a family member along with an animation distraction as compared to who were held by a family member during venipuncture. This finding is supported by a study conducted by A. Bagnasco [6] in which during venipuncture a video was shown to the patient. Study concluded that Audio-visual distraction effectively improved pain management and favored children's cooperation during venipuncture. Similarly Jeena James [7] investigated the effectiveness of "Animated Cartoons" as a distraction strategy to reduce the perception of pain during venipuncture. The study revealed that, animated cartoon is an effective distraction strategy to reduce pain among the children undergoing venipuncture.

Hana Yoo, et al., [8] conducted a research to identify the effects of an animation distraction intervention on pain response during venipuncture. The experimental group (n = 20) was provided with an animation distraction intervention using a laptop computer during their first venipuncture, and the control group (n = 20) received standard treatment. There were statistically significant differences in self-reported pain response, behavioural pain response, blood cortisol, and blood glucose between the experimental group and the control group. Findings of this study also support the findings of present study.

The findings of present study also revealed that there was no influence of relationship of family member to the child on level of pain perception. Findings are supported by McMurtry CM, et al., [9] who investigated whether children perceive their parents as fearful when they reassure using complementary observational and experimental methodologies during venipuncture. The children provided higher ratings of fear during reassurance than distraction. The results provide insight into the complexity of adult reassurance and highlight the important role of parental facial expression, tone, and verbal content during painful medical procedures.

A study conducted by Lucie Sikorova, Petra Hrazdilova [10] also supports the findings of present study who revealed that a greater level of pain was in children where the parents were present. The psychological intervention carried out by a nurse proved to lower pain levels from venipuncture as measured by the CHEOPS scale and evaluated using the self-report scale.

LIMITATIONS

The limitation of the present study is the previous pain experience due to venipuncture was not considered.

The present study depicts that there is statistically significant difference between the analgesic effects of holding the child by a family member versus holding the child by a family member along with an animation distraction intervention on the level of pain perception during venipuncture in children up to seven years of age. In past no study has ever compared the analgesic effect of child held by a family member and child held by a family member along with an animation distraction. Hopefully, the current study will act as a source of discussion for future studies.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interests regarding the publication of this article.

CONCLUSION

The following conclusions are drawn on the basis of the findings of the study:

- Severe level of pain was experienced by children undergoing venipuncture expressed by FLACC pain scale scores.
- There is a highly significant reduction in level of pain when venipuncture is done to a child who was held by family member along with an animation distraction in comparison to family member alone during venipuncture.
- Hence the research hypothesis is accepted i.e. analgesic effect of family member along with an animation distraction intervention is more effective than presence of family member alone in managing pain in children up to seven years of age during venipuncture.

RECOMMENDATIONS

- Further studies can be conducted in future regarding the analgesic effect of animation distraction on pain related to other painful procedures like intra muscular injections, Lumbar Puncture etc.
- Further researches can be conducted by taking other non-pharmacological strategies (like imagery, blowing bubbles etc.) as an intervention.
- The study can be replicated on a large sample to validate and generalize its findings.
- A multi-Centric study could be done.

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