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A Study To Assess The Effectiveness Of Leg Crossing And Hand Gripping Technique On Pain Level Among Children Admitted In Pediatric Ward During Venipuncture Procedure At Government Hospital, Daman

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ABSTRACT

Background: Pain is a part of life. Occasionally it is useful and can be a warning sign of risk, injury or illness. Children learn to avoid something that may cause injury or harm because of pain, but for curative, preventive and promotive care the child have to undergo with immunization and hospitalization and they are been exposed with needle-related procedures. These procedures often cause pain and worry and slow their healing process. The distraction works on pain control theory, can be achieve through leg crossing and hand gripping technique. This mechanical stimulation activates mechanoreceptors, which close the "gate" of pain transmission and inhibit the pain signals. So, leg crossing and hand gripping will give relaxation and active distraction in the child's body. **Aim**: To reduce the pain among children admitted in pediatric ward during venipuncture procedure. **Methodology**: A Quasi experimental non-equivalent control group post-test-only design was used for both control and experimental group. Total 62 samples were selected by using purposive sampling technique and the pain was assessed by Wong-Baker FACES pain scale. Results: The post-test mean score and SD of control and experimental group was (6.064±1.965) and (3.935 ±1.590) respectively. Mean difference is 2.129 and calculated 't' value was 4.79 is more than table value (2.00). The study result shows that the leg crossing and hand gripping technique during venipuncture procedure is more effective than the routine procedure. **Conclusion**: Thus, it was significantly proved that the leg crossing and hand gripping technique is more effective to perceive less pain than routine venipuncture procedure among children admitted in pediatric ward.

KEYWORDS: Routine venipuncture procedure, leg crossing and hand gripping technique, children, Wong-Baker pain score scale.

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INTRODUCTION

Children are adored by everyone in the community. Children form an important part of a nation's population since they are our next generation. Today's children are tomorrow's future. Having children makes you happy because they create lifelong memories. Children can be really immature and silly. They frequently make foolish statements and actions. Such events can create wonderful memories and may have been humorous at the time.

Due to this developmental period of children, generally they're really active and curious to perform new activities which can eventually give them injury and illness and that's why they're prone to minor and major injury or other health problem. About three-fourth of the children are considered as unhealthy and surviving with the impairment of physical and intellectual function of poor health status. There are differences in illness between children and adults and they are grounded on anatomic, physiologic and mental differences. For therapeutic, preventative and promotive care of the children they have to suffer with immunization and hospitalization. For the treatment and laboratory investigation they're being exposed with needle-related procedures. These procedures frequently bring pain, fear, uneasiness, modesty and they respond with defence mechanisms like separation, anxiety, negativism, depression.

Pain relief is a fundamental right of all the children. Pain can be reduced with leg crossing with muscle tensing and hand gripping technique and this doesn't mean that you'll ignore the pain completely and suffer in silence. It just means that you can divert your mind from pain. This allows your body and mind to be stronger and avoid the sense of pain. It'll hurt if the child will think about the pain cause by the venipuncture. So, why not just avoid the thought and concentrate more on the task at other hand. Eventually it also gives relaxation to the child body due to contraction and relaxation of body muscles during performing this technique. The leg-crossing and muscle-tensing techniques help reduce the pain of intravenous cannulation through gate control theory, which blocks or hamper the pain signals by introducing non-painful stimulants (Muscle tension) reduces perception of pain. This combination of physiological and psychological factors can significantly reduce the discomfort and pain associated with needle insertion.

Squeezing a ball is a simple and effective technique to reduce pain and fear associated with venipuncture in children. This technique involves squeezing a soft ball such as a sponge ball/stress ball/rubber ball during the procedure to distract the child from the needle insertion and reduce their anxiety. When a child squeezes the ball, it provides a physical outlet for their stress and anxiety, allowing them to concentrate on the sensation of the ball rather than the needle pain. This distraction can help to reduce the child's perception of pain and discomfort during the procedure. Benefits are that it is simple and easy to administer, no special tools required and can be used in combine with other distraction techniques.

In pain gate theory, there are various nerve fibers out of which "C" fibers are responsible for slow or dull pain, it will be experienced by a person during venipuncture procedure. This "C" fibers carry the pain information from peripheral tissue to the spinal cord and brain. When tissue is damaged, it releases various chemicals such as prostaglandins, bradykinin, histamine and potassium ions. These activate pain receptors on "C" fibres, leading to generation of action potentials and travel towards spinal cord. This phase is called transduction phase, where physical damage converted into electrical signal that can interpretated by nervous system. This "C", opens the gate present at dorsal horn of spinal cord and the pain signals get into the brain. The distraction works on pain control theory, can be achieve through leg crossing and hand gripping technique by squeezing a ball. This mechanical stimulation activates mechanoreceptors, which close the "gate" of pain transmission and inhibit the pain signals. As a result, the child is less likely to perceive the pain, which is reflected in the decrease in pain scores within the intervention group.

Pain management is important in nursing because nurses can help the children to achieve a better quality of life and enhance their response to treatment. Pain management can help their children to get less traumatic memories and can reduce stress, blood pressure and heart rate among children.

OBJECTIVES OF THE STUDY

1. To assess the pain level among children admitted in pediatric ward during venipuncture procedure in control group and experimental group.
2. To assess the effectiveness of leg crossing and hand gripping technique on pain level among children admitted in pediatric ward during venipuncture procedure
3. To find out the association between post test score and the selected demographic variables in control group and experimental group.

HYPOTHESIS

The hypotheses will be tested at <0.05 level of significance.

H_1: There will be significant mean difference between pain level among children admitted in pediatric ward during venipuncture procedure in control group and experimental group.

H_2: There will be significant association between post test score and the selected demographic variables in control group and experimental group.

METHODOLOGY

Research approach : The research approach used for this study was quantitative research approach.

Research Design: The research design used was quasi-experimental non-equivalent control group post-test-only design for both experimental and control group.

Research setting: Pediatric ward, Government Hospital, Daman

Independent variable: leg crossing and hand gripping technique

Dependent variable: Pain

Sample size: In this study the sample size was 62 (31 in each control group and experimental group) Sample size was calculated through power analysis and the values were, mean-1 is 5.966, mean-2 is 7.033, mean difference is 1.067, SD-1 is 1.95, SD-2 is 1.711, ratio between both group is 1, alpha two sided is 0.05, power is 0.9 among population of 216 people calculated through formula as follows.

Formula :-

$$n=\frac{(Z1-\alpha/2+Z1-\beta)^2\times(\sigma^2+\sigma^2)/r}{(Mean_1-Mean_2)^2}$$

Sampling technique: purposive non-probability sampling Technique.

Inclusion criteria:

- The children age group of 6 years to 12 years admitted in pediatric ward.
- The children who are willing to take part in this research study.
- The children who are able to understand Hindi, Gujarati and English Language.
- The children who are able to follow verbal commands.

- The children who are been advised with intravenous cannulation by pediatrician

Exclusion criteria:

- The children who are not willing to take part of this research study.
- The children who are differently abled (physical and mental) to actively participate in the leg crossing and hand gripping interventions.

ETHICAL CONSIDERATION

Prior to data collection written permission was obtained from the managing directors of institutes NAMO Medical Education and Research institutes and SVBCH, U.T. of Dadra and Nagar Haveli.

TOOL USED FOR DATA COLLECTION:

Section I: Demographic Data:

It consisted of selected demographic variables like Age of the children, Gender of the children, Education of the child, previous exposure of venipuncture with number of exposures.

The tool was translated to Gujarati and Hindi by language experts. The language validity was determined by giving the tool to another language expert to retranslate the tool to English.

Section II: The self-assessment Wong-Baker FACES pain scale:

The Wong-Baker FACES Pain Rating Scale was created by Donna Wong and Connie Baker to help children effectively communicate about their pain. Once practitioners clearly understood the child's pain, they could develop a quality treatment and support plan.

RESULT

SECTION-I : Assess the frequency and percentage distribution of children according to their demographic variable.
n= 62

Sr. No	Demographic Variable	Control Group		Experimental Group	
		Frequency	Percentage (%)	Frequency	Percentage (%)
1.	**Age of the children**				
	a. 6 years	7	22.58	7	22.58
	b. 7 years	10	32.26	8	25.81
	c. 8 years	1	3.23	0	0.00
	d. 9 years	3	9.68	3	9.68
	e. 10 years	3	9.68	3	9.68
	f. 11 years	3	9.68	4	12.90
	g. 12 years	4	12.90	6	19.35
2.	**Gender of the children**				
	a. Male	17	54.84	14	45.16
	b. Female	14	45.16	17	54.84
	c. Transgender	0	0	0	0
3.	**Education of the children**				
	a. Illiterate	0	0.00	0	0.00
	b. 1st standard	15	48.39	12	38.71
	c. 2nd standard	2	6.45	3	9.68
	d. 3rd standard	1	3.23	0	0.00
	e. 4th standard	3	9.68	3	9.68
	f. 5th standard	3	9.68	2	6.45
	g. 6th standard	3	9.68	5	16.13
	d. 7th standard	4	12.90	6	19.35
	Previous exposure to venipuncture				
	a. Yes	11	35.48	15	48.39
	b. No	20	64.52	16	51.61
	4.1 If yes then how many times?				
	a. 1	4	12.90	2	6.45

b. 2	2	6.45	5	16.13
c. 3	2	6.45	5	16.13
d. >3	3	9.68	3	9.68

SECTION-II: Assess the post-test pain level among children admitted in pediatric ward during venipuncture procedure in control group and experimental group.
n= 62

Wong-Baker FACES pain scale.	Control group		Experimental group	
	Frequency	Percentage (%)	Frequency	Percentage (%)
0- no hurt or pain	0	0	0	0
2- it hurts a little bit	2	6.5	10	32.3
4- it hurts a little more	6	19.4	12	38.7
6- it hurts even more	14	45.2	9	29
8- it hurts a whole lot	7	22.6	0	0
10- it hurts the worst	2	6.5	0	0
Total	31	100	31	100

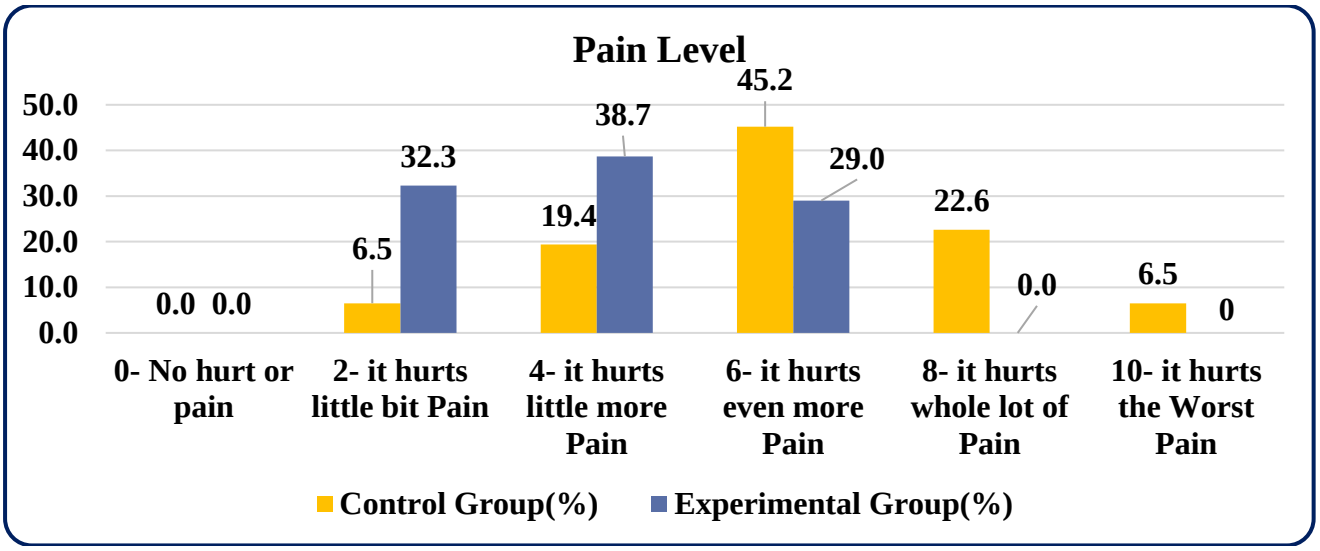

Figure-1: Distribution of post- test pain score among children during venipuncture.

SECTION-III: Analysis of the effectiveness of leg crossing and Hand gripping technique on pain among children during venipuncture procedure admitted in pediatric ward.
n= 62

Group	Mean	Mean difference	SD	SE	Calculated 't' value	df	Table value	Level of significance
control group (post-test)	6.064	2.129	1.965	0.353	4.79	60	2.00	S*
Experimental group (post-test)	3.935		1.590	0.286				

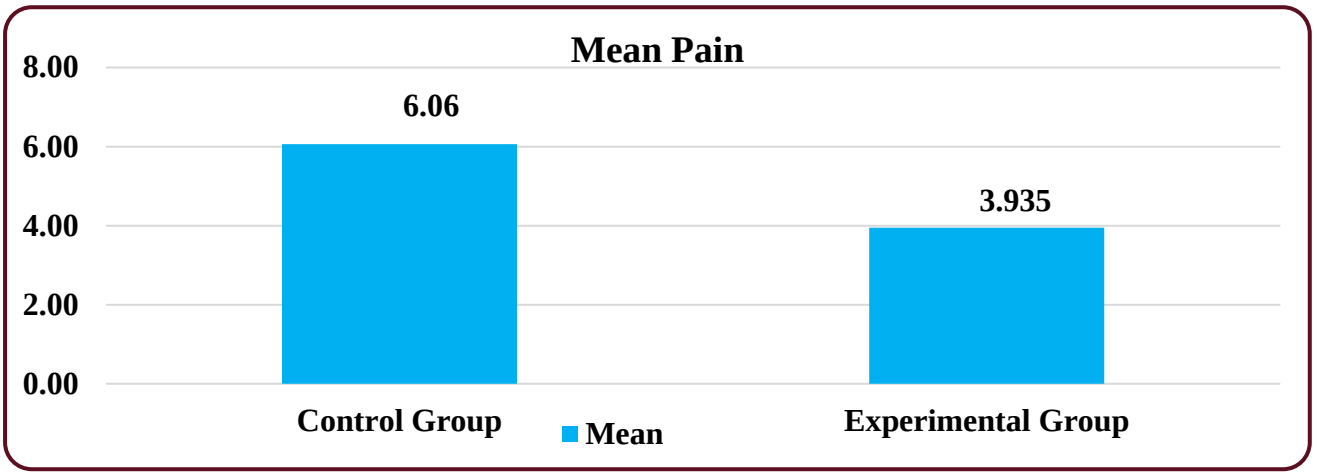

Fig2: Distribution of pain level mean score during venipuncture procedure in control and experimental group.

SECTION-IV: (A) Assess the association between post-test pain level among children admitted in pediatric ward undergoing venipuncture procedure and selected demographic variables in control group.
n= 31

Sr. No.	Demographic variable	Category	Pain score		$\chi 2$	df	Table Value	*P* - Value	Level of significance
			<Median	≥Median					
1.	Age in the children	6 years	1	6	11.554	5	11.07	0.041	S*
		7 years	0	10					
		9 years	1	2					
		10 years	2	1					
		11 years	1	2					
		12 years	3	1					
2.	Gender of the children	Male	6	11	1.77	1	3.84	0.183	NS
		Female	2	12					
3.	Education of the children	1st standard	1	14	11.763	6	12.59	0.067	NS
		2nd standard	0	2					
		3rd standard	0	1					

		4th standard	1	2					
		5th standard	2	1					
		6th standard	1	2					
		7th standard	3	1					
4.	**Previous exposure to vein flow**	Yes	4	7	0.992	1	3.84	0.319	NS
		No	4	16					
	4.1. If yes, then How many times	1	0	4	8.119	3	7.82	0.043	S*
		2	0	2					
		3	2	0					
		> 3	2	1					

(B) Assess the association between post-test pain level among children admitted in pediatric ward undergoing venipuncture procedure and selected demographic variables in experimental group.
n= 31

Sr. No.	Demographic variable	Category	Pain score		$\chi 2$	df	Table Value	*P* - Value	Inference
			<Median	≥Median					
1.	Age in the children	6 years	1	6	9.345	5	11.07	0.09	NS
		7 years	1	7					
		9 years	1	2					
		10 years	3	0					
		11 years	2	2					
		12 years	2	4					
2.	Gender of the children	Male	9	5	11.984	1	3.84	0.0005	S*
		Female	1	16					
3.	Education of the children	1st standard	2	10	10.527	6	12.59	0.104	NS
		2nd standard	0	3					
		3rd standard	1	2					
		4th standard	2	0					
		5th standard	3	2					
		6th standard	2	4					
		7th standard	2	10					
4.	Previous exposure to vein flow	Yes	6	9	0.797	1	3.84	0.371	NS
		No	4	12					
	4.1. If yes, then How many times	1	0	2	2.184	3	7.82	0.53	NS
		2	3	2					
		3	2	3					
		> 3	2	2					

Note:
S*: The p-value is less than 0.05
NS: Non-significant

CONCLUSION

Due to leg crossing and hand gripping technique the children perceive less pain during venipuncture procedure. The finding from the present study concluded that leg crossing and hand gripping technique was effective to perceive less pain among children admitted in pediatric ward during venipuncture procedure in Government Hospital, Daman.

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