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Effectiveness of Diversional Activity on Pain and Anxiety during Venipuncture among Children in a Selected Hospital Dehradun, Uttarakhand

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Abstract

Background: Hospitalization is stressful condition for children of all age groups. Venipuncture is one of the common painful procedures performed in hospital. Pediatric patients are often subjected to unexpected medical procedures that cause pain and anxiety.

Statement of the problem: "A study to assess the effectiveness of Diversional Activity on pain and anxiety during venipuncture among children in a selected Hospital of Dehradun, Uttarakhand".

Objectives: To determine the effectiveness of diversional activity on pain and anxiety during venipuncture among children in both experimental and control group and to find the association between level of pre interventional anxiety and pain of children with their personal profile.

Methodology: A quantitative research approach with quasi experimental, two group pre-test post-test design for anxiety and post-test only design for pain was used. The study was conducted in pediatric areas of Himalayan Hospital, Dehradun, Uttarakhand. Consecutive sampling technique was used to select the study subjects. Data was collected from 69 children (34 in control group and 35 in experimental group) by using children's fear scale to measure anxiety and Wong Baker Face Pain scale to measure pain.

Results: The mean post interventional anxiety score of children in experimental group was 1.2 ± 0.54 which was significantly lower than the control group 3.4 ± 0.5. The mean post interventional pain score of children in experimental group was 4.5 ± 1.9 which was significantly lower than the control group 9.1 ± 1.3. Comparison of mean post interventional anxiety of experimental and control group was done by using independent 't' test and calculated 't' value was 8.4 which was found statistically significant at $p<0.05$. Comparison of mean pain score of children in experimental group and control group was computed by using independent 't' test and calculated 't' value was 5.54 and also found statistically significant at $p<0.05$.

Conclusion: On the basis of findings the investigator concluded that the diversional activity was effective in reducing anxiety and pain during venipuncture.

Keywords: Effectiveness; Pain; Anxiety; Venipuncture; Diversional activity

Introduction

Hospitalized children are usually segregated by care requirements or by age or by both. Children needs can be classified under three main headings: Adequate provision of care; protection from physical danger and protection from a psychologically threatening environment [1]. Hospitalization is considered as a stressful event for the children; the environment which surrounds the children in a hospital, physical conditions such as pain, anxiety, underlying disease, hospital procedures or even a medical examination in the hospital could be stressor for children [2]. During the early years, crises of illness and hospitalization have adverse impact on routine activities and rituals of children [3]. Venous cannulation often is performed without any analgesia; even though the pain associated with this procedure is at times very distressing [4]. Venipuncture has been reported to be the most common painful event for a hospitalized child [5]. About 28% to 83% of pediatric patient are diagnosed with acute behavioral distress while routine venipuncture test [6]. Pain is one of the most common causes of human suffering, warning sign for physical harm which is typically undertreated [7]. Pain is described as the fifth vital sign and inadequate pain management is linked to numerous immediate and long term negative outcomes [8]. Pain is a highly prevalent problem in children and adults. It is a predominantly subjective emotional distress that leads to impairment in the quality of life [9]. It is reported that anxiety in children can increase their subjective perception of pain, but

it can reduced if their attention is focused on a pleasant activity [10]. Play is an essential part of a child's life and is an important aspect in fostering growth and development. Toys are the "tools" of play and provide a more "natural" environment for a child. The proper selection and use of toys can reduce the traumatic effects of hospitalization experiences and aid in the recovery phase of illness [11]. Distraction is one of the techniques to gain the co-operation and overcome of the anxiety. Distraction means focusing on the thing other than the things which are causing pain and anxiety. Distraction just pulls the focus of mind from one thing to another it doesn't erase the pain or anxiety causing element [12]. In a hospital setting, children often experience unpredictable and sever procedure-related pain that can be associated with negative emotional and psychological implications. Child health care is a major public issue for last 2 decades now. Disease whether with severe or sudden onset or by contrast a long developing creates a foot mark on the mind of the children which cause further problem in venipuncture [13]. The American pain society reveals 70% of children reported pain during hospitalization, almost 30% reported sever pain and 15% reported extremely severe pain 1992 to 2004 [14]. Unplanned visits, family anxiety, illness and injury lead to significant emotional and physical distress [10]. Medical procedures can be daunting for many. Children are often more disturbed and threatened by medical situations because of the separation from caregivers and the novelty of the situation [15]. Children's adverse reactions to hospitalization have long been recognized. Such reactions include short term sequelae to hospitalization such as sleep disturbance and aggression [16].

Statement of Problem

"A study to assess the effectiveness of diversional activity on pain and anxiety during venipuncture among children in a selected hospital of Dehradun, Uttarakhand".

Objectives of the Study

1. To assess the pre and post interventional anxiety of children in control (routine care) and experimental group (diversional activity).
2. To compare post interventional anxiety score of children during venipuncture in control and experimental group.
3. To compare post interventional pain score of children during venipuncture in control and experimental group.
4. To find association between level of pre interventional anxiety of children with their personal profile.
5. To find association between level of pain in children with their personal profile.

Hypotheses

All the hypotheses would be tested at $p<0.05$.

H1: The mean post interventional anxiety scores of children in experimental group would be significantly lower than the control group.

H2: The mean post interventional pain score of children in experimental group would be significantly lower than control group.

H3: There would be significant association between the level of pre interventional anxiety of children and their personal profile.

H4: There would be significant association between the level of pain in children and their personal profile.

Methodology

Research approach

Research approach indicates the basic procedure of conducting the research. Quantitative research approach was adopted as research approach in the present study.

Research design

In this present study quasi experimental, two group (experimental and control Group) was pretest.

Posttest design was used for the variable anxiety and two group (experimental and control group) posttest only design was used for the variable pain as research design.

Variables

The variables in present study includes:

Independent variables: The independent variable used in the study was diversional activity.

Dependent variables: The dependent variables used in the study were pain and anxiety of children.

Research hypotheses

The aim of the study was to test the following hypotheses. All the hypotheses were tested at $p<0.05$ level of significance.

- **H1:** The mean post interventional anxiety score of children in experimental group would be significantly lower than the control group.
- **H2:** The mean post interventional pain score of children in experimental group would be significantly lower than control group.
- **H3:** There would be significant association between the levels of pre interventional anxiety of children with their personal profile.
- **H4:** There would be significant association between the levels of post interventional pain of children with their personal profile.

Setting of the study

The present study was conducted in Himalayan Institute Hospital Trust, Swami Ram Nagar, Dehradun. It is 750 bedded hospital with multispecialty hospital, which provides routine as well as super speciality services at an affordable cost. Here treatment modalities for children are Pediatric medicine ward and surgical care, plastic surgery and pediartic oncology, available at reasonable cost. In pediatric units approximately 200- 250 children admitted per month. The selection of the area was done on the basis of geographical proximity, feasibility for conducting study and availability of sample. The setting for the study was Pediatric areas of HIHT (Pediatric medicine ward, Plastic surgery ward and Pediatric oncology ward).

Population

The population under study constituted children aged between 6-12 years.

Sample

Children of age group 6-12 years who were admitted in pediatric areas of selected hospital were taken as sample in the study. Consent was taken from the parents of children to conduct the study as they were minors.

Sample size

In the present study, sample size was 69 children between the age group of 6-12 years (34 in control group and 35 in experimental group).

Sampling technique

Selection of subjects for present study was done by using consecutive sampling technique. All the subjects who fulfilled the inclusion criteria and available at the time of data collection were selected for the study.

Sampling criteria

The criteria used for selection of study subject includes:

Inclusion criteria: The following criteria were included in the study.

- Children scheduled for venipuncture.
- Children who were conscious and mentally alert.
- Both male and female child.

Exclusion criteria:

- Children who brought for emergency critical care were excluded from the study.
- Children who already had any kind of pain present at the time of veinpunture.

Description and Development of Tool

The tool consisted of the following:

Tool 1: Personal profile consists of age, gender, diagnosis, area of residence, history of previous hospitalization, previous experience of venipuncture, presence of caregiver during venipuncture and number of prick.

Tool 2: Children's fear scale [17] (CFS) was used to assess the anxiety during venipuncture. According to this scale the highest score is 04 which indicate extreme anxiety and the lowest score is 0 which indicates no anxiety.

Tool 3: Face pain scale was developed by wong baker. It was used to assess the pain during venipuncture. According to this scale the highest score is 10 which indicate hurts as much as you can imagine and lowest score is 0 which indicates no hurt.

Content validity

The tools were validated from seven experts. The experts were requested to various departments which include one from Psychiatric Department, three from Child Health Nursing Department, one from Mental Health Nursing Department, one from Medical Surgical Department and one from Pediatric Oncology Department. The selection of experts was based on their experience and clinical expertise. They were requested to give their opinion on the criteria checklist regarding adequacy, relevance, appropriateness and organization of items in the tool. Modifications given by different experts were incorporated and necessary modification was done in pain and anxiety tool as per expert's suggestion.

Reliability

Reliability of an instrument is the degree of consistency with which it measures the attributes it is supposed to measure. Reliability of the tool was done through interrator method by administering the tool to 20 children admitted in the selected hospital, Dehradun. Tool was found reliable (r=0.75 for anxiety) and (r=0.9 for pain).

Pre-testing

Pre-testing was done to determine clarity of items, understanding of language and time required to complete the items. Tool was administered to five children admitted in a selected hospital, Dehradun. There was no difficulty in language while administering tools and intervention. It took 30-35 minutes to collect the data from each subject.

Ethical consideration

The proposed study was conducted after taking administrative permission from Principal of Himalayan College of Nursing and Ethical permissions were obtained from ethical committee SRHU. After explaining the purpose of the study, written consent was taken from the parents of children as they were minors. They were informed that finding will be kept confidential and they can withdraw their children from the study at any time whenever they find difficulty or inconveniences. The confidentiality was maintained throughout the study.

Pilot study

Pilot study was conducted from 7th December to 12th December 2016 after taking permission from higher authority of the college. After obtaining written consent from the parent of the child, researcher met the subject who fulfilled inclusion criteria and informed about the venipuncture. Then with the help of tool 1 (personal profile) the data was collected from the parents by interview method in continuation with that pre-anxiety of the child was assessed with the help of tool 2 (children's fear scale). Then the child left for about 30-35 minutes (in experimental group the child receive diversional activity whereas in control group the child receive routine care). The child brought to procedure room for venipuncture. Before venipuncture researcher assessed post anxiety with the help of same tool (children's fear scale). During venipuncture, by using wong baker face pain scale the pain of the child was assessed. Result shows that there was significant difference in anxiety and pain score of experimental and control group at $p<0.05$ level of significance. The findings of the pilot study revealed that the study was feasible and practicable.

Data collection process

Data for the main study was collected from the selected subjects. After ethical clearance, written consent was obtained from parents and the aim of the study was explained to the parents of the child. In order to prevent sample contamination investigator took control group first and then experimental group.

In control group, investigator met the children who fulfill the inclusion criteria and informed about venipuncture to each child. Then

with the help of tool 1 (personal profile) the data was collected from the parents of the children by interview method and continuation with that pre-interventional anxiety of the child was assessed by using tool 2 (children's fear scale). Then the child was left for about 30-35 minutes and was provided routine care as intervention. Then the child was brought to the procedure room for venipuncture. Post-interventional anxiety was assessed just before venipuncture with the same tool. During venipuncture the pain of the child was assessed by using tool 3 (wong baker face pain scale).

Whereas in experimental group each child was informed about venipuncture. Then with help of tool 1 (personal profile) data was collected from the parents of child and pre-interventional anxiety of the child was assessed by using tool 2 (children's fear scale). After that the distraction activity as intervention was given to each child for 30-35 minutes. During distraction activity the child was asked to select toys as per their likes from the selected toys and engaged with toys. Then the child was brought to procedure room for venipuncture where posters, charts or cartoons are displayed in the procedure room. Post interventional anxiety was assessed by using same tool 2 (children's fear scale) just before the venipuncture. During venipuncture the pain of the child was assessed by using tool 3 (wong baker face pain scale).

Plan for data analysis

Data analysis was done according to objectives and hypotheses of the study by using descriptive and inferential statistics. A master sheet was prepared based on responses given by the study participants. Following tests were done for analyzing the data.

- Frequency, percentage
- Mean, median, SD, paired and independent 't' test.
- Chi-square, Yates' correction, fisher exact.

Analysis and Interpretation

Section-A: Personal profile of study participants

Table 1 Showed that half of the children 51.42% were between the age group of 9-12 years in experimental group where as 52.94% were between the age group 9-12 years in control group. More than half 62.8% children were male in experimental group and 61.2% were male in control group. Most of children 54.3% were surgically diagnosed in experimental group and more than half 58.8% of the study were medically diagnosed in control group. Half of the children 51.5% were belong to urban area in experimental group and majority 73.5% of children were belong to rural area in control group. Most of the children 45.7% were first child in family in experimental group and 50.2% children were second child in family in control group. Majority 74.2% of the children had previous experience of hospitalization in experimental group and 76.5% children had experience of previous hospitalization in control group. Majority 74.2% of children had previous experience of cannulisation in experimental group and 76.5% of children had previous experience of cannulisation in control group. Most of the mother's 54.3% were present at the time of venipuncture in experimental group and 47.2% father were present during venipuncture in control group. Majority of children 91.5% undergone only one prick during venipuncture in experimental group and 85.3% children undergone one prick during venipuncture in control group.

N=69								
S.No	Characteristics	Experimental group		Control group		Total		p value
		f	%	f	%	F	%	
1	**Age of children**							
	6-8 years	17	48.58	16	47.06	34	49.28	0.49
	9-12 years	18	51.42	18	52.94	36	52.72	
2	**Gender**							
	Male	22	62.8	21	61.2	43	62.32	0.48
	Female	13	37.2	13	38.8	26	37.68	
3	**Type of diagnosis**							
	Medical	16	45.7	20	58.8	36	52.2	0.5
	Surgical	19	54.3	14	41.2	33	47.8	
4	**Area of residence**							
	Rural	17	48.5	25	73.5	42	60.8	0.5
	Urban	18	51.5	9	26.5	27	39.2	
5	**Birth order**							
	First	16	45.7	11	32.2	27	39.13	0.5
	Second	13	37.1	17	50.2	30	43.01	
	Third	5	14.4	6	17.6	11	15.06	
	Fourth	1	2.8	-	-	1	2.8	
6	**Have your child hospitalized before?**							
	No	9	25.8	8	23.5	17	24.64	0.49
	Yes	26	74.2	26	76.5	52	75.36	
7	**Previous experience of cannulization**							
	Yes	26	74.2	26	76.5	52	75.36	0.49
	No	9	25.8	8	23.5	17	24.64	
8	**Presence of care giver during cannulisation (n=65)**							
	Mother	19	54.3	16	47	35	50.7	0.49
	Father	14	40	16	47.2	30	44.2	
	Grandparents	2	5.7	2	5.8	4	5.1	
9	**Number of prick**							
	One	32	91.5	29	85.3	61	88.5	0.5
	Two	3	8.5	5	14.7	8	11.5	

Table 1: Frequency, percentage distribution and test of homogeneity of personal profile of children.

Independent t test was used to find the difference between the experimental and control group. The table revealed that there is no significant difference between experimental and control group in terms of personal profile such as age, gender, diagnosis, birth order and area of residence. Hence it can be interpreted that participants in control and experimental group were homogenous.

Section-B: Effectiveness of diversional activity on anxiety

N=69				
Group	**Pre-intervention anxiety score Mean ± SD**	**Post-intervention anxiety score Mean ± SD**	**'t' value**	**p value**
Control group	2.7 ± 0.80	3.4 ± 0.55	6.94	0.001
Experimental group	3.5 ± 0.55	1.2 ± 0.54	9.9	0.0001
Maximum possible score= 4, t_{33}=2.02 , t_{34}=2.02, level of significance<0.05				

Table 2: Effectiveness of intervention on anxiety of children among control (routine care) and experimental group (diversional activity).

Table 2 illustrated that mean pre interventional (routine care) anxiety score and standard deviation of children in control group was 2.7 ± 0.80 and mean post interventional anxiety score and standard deviation was 3.4 ± 0.55. Paired 't" test were calculated and the value was 6.94, whereas, in experimental group the mean pre and post interventional anxiety score was 3.5 ± 0.55 and 1.2 ± 0.54. Paired 't' test were calculated and value was 9.9.

N=69				
Groups	**Post interventional anxiety Mean ± SD**	**Obtained range**	**'t' Value**	**p value**
Experimental group	1.2 ± 0.54	0-3	8.4	0.001
Control group	3.4 ± 0.55	2-4		
Maximum possible score=4, t_{67}=1.98, level of significance<0.05.				

Table 3: Comparison of post interventional anxiety score of children in control and experimental group.

Table 3 illustrated that the mean post interventional anxiety score and standard deviation of children in experimental group was 1.2 ± 0.54 whereas the mean post interventional anxiety and standard deviation of children in control group was 3.4 ± 0.55. The calculated 't' value was 8.4 which was higher than the tabulated value 1.98 at <0.05 level of significance.

N=69				
Groups	**Post interventional Pain Mean ± SD**	**Obtained range**	**'t' Value**	**p value**
Experimental group	4.5 ± 1.8	02-10	5.54	0.001
Control group	9.1 ± 1.3	06-10		
Maximum possible score=10, t_{67}=1.98, level of significance<0.05.				

Table 4: Comparison of post interventional pain score of children in experimental and control group.

Table 4 illustrated that mean post interventional pain score and standard deviation of children in experimental group was 4.5 ± 1.8 whereas in control group it was 9.1 ± 1.3. Independent 't' test was calculated to find the difference and value was 5.54 which was higher than the tabulated value 1.98 at <0.05 level of significance.

Section C: Association between anxiety and personal profile of children

Table 5 showed that there is statistically significant association between pre interventional level of anxiety of children with area of residence (chi-square=8.95) at p=0.002 level of significance whereas, there was no significant association found with other variables like age, type of diagnosis, gender, birth order, hospitalization before, previous experience of cannulisation, presence of caregiver during cannulization and number of pricks.

Table 6 showed that there was no significant association between post interventional pain level of children with personal profile such as age, diagnosis, gender, area of residence, birth order, child hospitalised before, previous experience of cannulisation, presence of caregiver during venipuncture except number of prick (chi-square=0.04) p<0.05 level of significance.

N=69				
Characteristics	**Below median (<3)**	**At and above median (≥ 3)**	**Chi square (χ2)**	**p value**
Age of children				
6-8 years	03	30	2.02	#0.154
9-12 years	09	27		
Type of diagnosis				
Medical	06	30	0.233	0.629
Surgical	07	26		

Gender				
Male	05	38	2.638	0.10
Female	07	19		
Area of residence				
Rural	22	19	8.95	0.002
Urban	05	23		
Birth order				
First	02	25	0.26	#0.158
Second and above	10	32		
Have child hospitalized before				
No	01	16	1.153	#0.283
Yes	11	41		
Previous experience of cannulisation				
Yes	11	41	1.153	#0.283
No	01	16		
Presence of care giver during cannulisation				
Mother	08	26	0.29	0.851
Father	06	27		
Grandparents	00	02		
Number of prick				
One	09	52	1.21	#0.271
Two	03	05		
#indicates Yates correction test.				

Table 5: Association between pre interventional levels of anxiety of children with their personal profile.

N=69				
Characteristics	**Below median(<3)**	**At and above median (≥ 3)**	**Chi square (χ2)**	**p value**
Age of children				
6-8 years	11	22	0.059	0.80
9-12 years	13	23		
Diagnosis				
Medical	09	27	2.352	0.125
Surgical	14	19		
Gender				
Male	18	26	2.009	0.516
Female	06	19		

Area of residence				
Rural	13	29	1.295	0.255
Urban	12	15		
Birth order				
First	11	17	0.75	0.38
Second and above	12	29		
Have child hospitalized before				
No	17	35	0.40	0.52
Yes	07	10		
Previous experience of cannulization				
Yes	17	35	0.40	0.52
No	07	10		
Presence of care giver during cannulization				
Mother	13	22	0.262	#0.851
Father	09	20		
Grandparents	01	03		
Number of prick				
One	23	37	4.63	##0.04
Two	00	08		
(# indicates Yates correction test, ## indicates fisher exact test).				

Table 6: Association level of pain of children with their personal profile.

Discussion

The finding of the present study showed that there was significant difference in the post anxiety score of experimental group as compared to the control group. The post interventional anxiety score of experimental group is lower than that of post interventional anxiety score of control group. This study was supported with the quasi experimental study done by James et al. (at Gujarat India) conducted to assess the effectiveness of play therapy on anxiety among hospitalized children. The study revealed that the post mean interventional anxiety of experimental group was lower than the post mean interventional anxiety score of control group [18]. Finding of the present study showed that the pain score of experimental group was lower than pain score of control group. This study was supported with the quasi experimental done by Umarani et al. (at Mangalore) conducted on effect of music therapy in reducing invasive procedural pain. The result revealed that pain score of children in experimental group was lower than control group [19].

Conclusion

The overall finding of the present study clearly indicated that use of diversional activity during venipuncture was significantly effective in reducing the anxiety and pain. Hence this can be concluded that diversional activity significantly effective in reducing anxiety and pain during venipuncture.

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