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Effectiveness of distraction technique upon pain among children (6 Month-24 Month) receiving vaccination at selected hospital at Mangaluru

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Abstract
Introduction: Recently increasing attention has been paid to the routine childhood immunization. Immunization is considered as one of the most significant medical achievement. During immunization lack of adequate pain management exposes children to unnecessary suffering from long term consequences, such as fear of needles. To reduce vaccine injection pain numerous pain management are available. However, Distraction is useful for children of all ages undergoing procedural pain. Distraction is one of the non-pharmacological method which is used for diverting attention from noxious stimulus and passively redirecting the attention by the subject in the performance of diversion technique. And it is considered as powerful method of pain management in children, in the first seven years of life because it does not require advanced cognitive skills.
The aim of the present study was to assess the effectiveness of distraction technique upon pain among children (6 month to 24 month) receiving vaccination at selected hospital at Mangaluru.
Objectives of the study: To assess the level of pain among children receiving immunization in experimental group and control group as measured by FLACC behavioral pain assessment. To Evaluate the effectiveness of distraction technique among children receiving immunization in experimental group. To find the Association in the level of pain among children receiving immunization in experimental group and control group and their selected baseline variables.
Method: Quasi-experimental research (post-test-only control group) design was used for this study. The sample was drawn through purposive sampling technique and comprised of 60 children undergoing immunization (30 in experimental and 30 in control group) in a selected Hospital in Mangalore. Data was collected using FLACC Behavioral assessment scale.
Result: The mean score of behavior response to pain of experimental group was 5.17± 1.74. The mean score of behavior response to pain of control group was 9.57± 0.57.
Majority of children in experimental group (66.7%) having moderate behavioral response to pain, only 20.0% were having severe response to pain and whereas in control group (100%) all the children experienced severe behavioral response to pain during immunization. The mean score of control group (9.57± 0.57) is greater than the experimental group (5.17± 1.74).
The unpaired t test showed that there was significant difference between the level of behavioral response to pain among children in experimental group and control group ($t_{58}=2.002$) at 0.05 level of significance.
There was no significant association between levels of pain among children in experimental group and control group with their selected demographic variables ($p>0.05$)
Conclusion: Finding of the study show that the rotating musical toy during immunization procedure can be an effective non pharmacological method of treatment to reduce the behavioral response to pain among children. The study concluded that the musical rotating toy can be an easy, effective, simple, non-invasive and cost-effective diversional technique had positive effect on children's distress behavior on pain and having no side effects on children who are receiving immunization.

Keywords: Musical rotating toy, immunization, behavioral response, pain, children

Introduction

Immunization is one of the worldwide requirements for all the new-born. One of the most notable achievements in the history of medicine is this. The immunization process is one of the most frequent and painful procedures performed on infants worldwide. It is a crucial public intervention and a cost-effective technique to manage infectious diseases, particularly in all children. It plays a crucial role in all children's promotion of good health and disease prevention strategies [1]. Parents pick immunizations as a preventive strategy because they want their kids to be free from any sickness [2]. Around the world, receiving standard hospital vaccinations is a more painful experience, and kids who get these shots convey their discomfort to their parents [3]. This discomfort may result in nervousness before a procedure for individuals giving the injections [4].

Distraction is a psychological intervention that involves directing the children attention away from the procedure. Distraction by a health care provider is effective for children of all ages, for children 3 years of age and older self-led distraction is also effective. Distraction led by a parent is less effective possibly because the parent has difficult providing distraction when he or she is also distressed. Distraction that can be commonly used for children include sound and light producing movable attractive toys, picture books, talking with the child and music etc., the children engage in more qualitative distraction leads to lower pain experienced by them, depend on the type of child distraction stimuli. Clinicians are advised to combine different pain-relieving strategies with combinations hence it improves pain relief. Distraction helps in the reduction of pain and focuses the activity in the environment. Distraction is useful for children of all ages undergoing procedural pain. diversion is one of the most often used, straightforward methods for relieving pain and anxiety. It takes little training and has theoretically good justifications for why it works in numerous medical situations.

The aim of current study was to examine the effectiveness of musical toy as a distraction tool for pain reduction in infants during vaccination procedure.

Objectives

1. To assess the level of pain among children receiving immunization in experimental group and control group as measured by FLACC behavioral pain assessment.
2. To evaluate the effectiveness of distraction technique among children receiving immunization in experimental group.
3. To find the association of the level of pain among children receiving immunization in experimental group and control group with their selected baseline variables.

Methodology

a quasi-experimental posttest only control design in which data is collected from research subjects after the intervention. Ethical clearance obtained from institutional committee. The formal permission was obtained from the medical officer, Ganjimatta Health Centre, Mangaluru.

The study samples were selected by purposive sampling method based on sample selection criteria. The study purpose and method were explained to the parent of selected children. Informed consent was obtained from the study participant's parent for participating in the study. All the children received their routine hospital care.

The main study was conducted for 6 weeks. The data were collected on every Thursday. The data was collected from 9am to 1pm. Every day average of ten subjects who were satisfying the inclusion criteria was selected. Totally 60 samples were selected by purposive sampling who fulfilled inclusion criteria. Among that 30 samples for experimental group, 30 for control group. The time taken to collect the data of each sample in experimental group is approximately 5 minutes.

The baseline data are gathered first, and then the parent is made to sit comfortably in a chair with the child on their lap by the researcher. The child was in the caretaker's arms. A musical rotating toy was introduced to the Experimental Group's kids two minutes prior to the inoculation, continued for one minute during the procedure, and continued for another two minutes after the operation was finished by the researcher. While the procedure was being done, routine care was given. Whereas children in the control group received immunization without any distraction and only routine care were maintained. The investigator observed and scored the child's response to acute pain by using FLACC behavioral pain assessment scale for both the groups. The data collection procedure was terminated by thanking the respondents.

Result

Section 1: Description of baseline Performa

Analysis of data related to baseline Performa of the toddler comprises of many factors such as age of the child, gender, weight of the child, child's past experience during vaccination, relationship with the care taker, position given during vaccination and known distraction technique. This section deals with the sample. The section deals with the sample characteristics of the subjective in terms of frequency and percentage.

Table 1: Distribution of samples according to demographic variables N= 60

Sl. No	Demographic variables	Experimental group (n=30)		Control group (n=30)	
		Frequency	Percentage	Frequency	Percentage
1	Age of child in months				
	6-12	15		13	43.3
	13-18	12	40.0	13	43.3
	19-24	3	10.0	4	13.3
2	Gender				
	Male	15	50.0	17	56.7
	Female	15	50.0	13	43.3
3	Weight of the child				
	<9kg	16	53.3	12	40.0
	9.1-10	9	30.0	12	40.0
	10.1-12kg	4	13.3	6	20.0
	>12kg	1	3.3		
4	Relationship of caretaker with the child				
	Father				
	Mother	30	100.0	30	100.0
	Others				
5	Income of the family Per month				
	<Rs10000				
	10001-15000	6	20.0	2	6.7
	15001-20000	14	46.7	8	26.7
	20001-25000	8	26.7	17	56.7
	>25000	2	6.7	3	10.0
6	Position of the child during present immunization				
	Lying position				
	On lap	30	100.0	30	100.0
7	Whether care taker knows any distraction techniques?				
	Yes	16	53.3	4	13.3
	No	14	46.7	26	86.7
	Any type of complications observed during previous vaccination?				
	Yes				
	No	30	100.0	30	100.0

Section 2: description of level of behavioural response to pain among children during immunization in control and experimental group.

This section deals with frequency and percentage of area wise mean percentage show that the behavioural response to pain in experimental and control group.

Table 2: Distribution of samples in experimental and control group according to level of pain N= 60

Level of Knowledge	Grading	Experimental group (n=30)		Control group (n=30)	
		Frequency	Percentage	Frequency	Percentage
Relaxed and comfortable	0				
Mild discomfort	1-3	4	13.3		
Moderate pain	4-6	20	66.7		
Severe discomfort or pain or both	7-10	6	20.0	30	100.0

Section 3: comparison of level of behavioural response to pain among children during immunization in experimental and control group.

Table 3: Range, mean, standard deviation and median of pain score among children in experimental and control group. N=60

Group	Range	Mean	Standard deviation	Median
Experimental (N=30)	1-8	5.17	1.74	6.0
Control (N=30)	8-10	9.57	0.57	10.0

The mean score of group control group (9.57± 0.57) is greater than the experimental group (5.17± 1.74).

Section 4: significant difference between level of behavioural response to pain among children during immunization in experimental group and experimental group.

To compare the difference between level of behavioural response to pain among children during immunization in experimental group and control group the following null hypothesis is stated:

H_{02}: There is no significant difference between level of behavioural response to pain among children during immunization in experimental Group and control group.

The above hypothesis is tested using unpaired 't' test.

Table 4: Mean, standard deviation, mean difference, t value and p value of post-test pain score among samples in experimental and control group. N=60

Group	Mean	SD	Mean difference	t value independent t test)	p value
Experimental (N=30)	5.17	1.74	4.40	13.141	<0.001***
Control (N=30)	9.57	0.57			

t (58) =2.002 at 0.05 level *** Significant at 0.001 level

The computed 't' value showed that a significant difference between the level of behavioural response to pain among children in experimental and control group (t_{58} =2.002) at 0.05 level of significance. hence the null hypothesis H_{01} is rejected and research hypothesis is accepted.

Section 5: Association of level of behavioural response to pain among children in experimental group and control group with their selected baseline variables.

This section deals with association of level of behavioural response to pain among children during immunization in experimental group and control group with their selected demographic variable is tested using chi square and Fisher exact test.

To find the association the following null hypothesis is stated

H_0: there is no significant association of level of behavioural response to pain and selected demographic variables.

Table 5: Association of pain score with selected demographic variables of children in experimental group N= 30

Sl. No	Demographic variables	Experimental Group		Total	χ^2 test
		≤Median (<6)	>Median (≥6)		
1	Age of child in months				
	6-12	7	8	15	χ^2=0.204
	13-18	5	7	12	
	19-24	1	2	3	
2	Gender				χ^2=1.222
	Male	8	7	15	
	Female	5	10	15	
3	weight of the child				
	<9kg	8	8	16	
	9.1-10	2	7	9	χ^2=4.321
	10.1-12kg	3	1	4	
	>12kg	0	1	1	
5	Income of the family Per month				χ^2=4.208
	<Rs10000				

	10001-15000	4	2	6	
	15001-20000	7	7	14	
	20001-25000	2	6	8	
	>25000	0	2	2	
7	care taker knows any distraction techniques				χ^2=2.039
	Yes	5	11	16	
	No	8	6	14	

NS – not significant

It is evident from table 5 that in the experimental group there is no significant association of level of pain during immunization with the selected baseline variables like age, gender, weight of a child, income of family, known distraction techniques. The obtained values of all these are lower than the table value. Therefore, null hypothesis was retained and research hypothesis was rejected**.**

Table 6: Association of pain score with selected demographic variables of children in control group N= 30

Sl. No	Demographic variables	Control Group		Total	χ^2 test
		≤Median (≤6)	>Median (>6)		
1	Age of child in months				
	6-12	4	9	13	χ^2=0.833
	13-18	6	7	13	
	19-24	2	2	4	
2	Gender				χ^2=0.362
	Male	6	11	17	
	Female	6	7	13	
3	weight of the child				
	<9kg	6	6	12	
	9.1-10	4	8	12	χ^2=0.833
	10.1-12kg	2	4	6	
	>12kg				
5	Income of the family Per month				
	<Rs10000				
	10001-15000	2	0	2	χ^2=3.815
	15001-20000	2	6	8	
	20001-25000	7	10	17	
	>25000	1	2	3	
7	whether care taker knows any distraction techniques?				
	Yes	2	2	4	χ^2=0.192
	No	10	16	26	

NS – not significant

It is evident from table 6 that in the control group there is no significant association of level of pain during immunization with the selected baseline variables like age, gender, weight of a child, income of family, known distraction techniques. The obtained values of all these are lower than the table value. Therefore, null hypothesis was retained and research hypothesis was rejected**.**

Discussion

Finding of the study

1. Description of the baseline proforma

- Majority (46.6%) of the samples were between 6-12month age.
- Majority (53.3%) of the samples were male.
- All children were brought by their mother.
- Majority (41.7%) of their family income is between Rs 21,000-25,000.
- Majority (46.6%) of children had more than 9kg weight at the time of immunization.
- All the study samples were kept on the lap of their mother during immunization.
- Majority (66.6%) of caretaker were unaware of distraction technique during immunization.
- No children had complication during previous immunization.

2. Description of level of behavioural response to pain among children during immunization in experimental group and control group.

The behavioural response to pain in **control group** is more in the areas like Legs (mean percentage 100%), Cry (mean percentage 100%), Face (mean percentage 93.3%) and comparatively less in Consolability (mean percentage 83%) and Activity (mean percentage 80%). In experimental group the behavioural response to pain was more in the areas of Legs (mean percentage 86.7%), Face (mean percentage 83.3%), Activity (mean percentage 80%) and comparatively less in Cry (mean percentag53.3%) and Consolability (mean percentage 46.7%)

3. Comparison of level of behavioural response to pain among children during immunization in experimental and control group.

The mean percentage shows that majority of experimental samples (66.70%) are having moderate behaviour response to pain, only (20.00%) are having severe behaviour response to pain. Whereas in control group all the children (100%) experienced severe experience of pain.

Children between the ages of 3 and 6 were the subjects of a "quasi-experimental study" on the use of cartoon distraction to lessen venipuncture pain in pre-schoolers in a few hospitals in Mangalore. The study included 60 pre-schoolers

who were chosen by convenience sampling. Additionally, samples were given to the experiment and control groups. According to the findings, 73% of pre-schoolers in the experimental group reported considerable pain, 20% reported severe pain, 7% reported light pain, and no pre-schoolers fell into the category of "no pain." Pre-schoolers in the control group experienced 93% severe pain, 7% moderate pain, and 0 light or no pain [5].

The forementioned conclusions are in line with a quasi-experimental study that was carried out to determine whether watching cartoons could help toddlers feel less pain when receiving vaccinations. Toddlers in the experimental group watched a cartoon movie on a laptop during immunization, whereas toddlers in the control group with normal routine care. Toddlers in group I (83.33%) responded to pain moderately on average. Only 16.7% of people had extreme behavioural reactions to pain. While in group II, 100% of the toddlers had a strong behavioural reaction to the pain of the vaccination. During vaccination, group II's mean score for behavioral response to pain (10.97 1.69) was higher than group I's (7.17 1.206) [6].

4. Significant difference between level of behavioral response to pain among children during immunization in experimental and control group.

There is a significant difference in the level of behavioral response to pain among children during immunization in experimental group and control group with ‘t’ value 13.148 at 0.05 level significance, which is more than the table value.

The aforementioned conclusions are in line with a quasi-experimental study that was carried out to determine whether watching cartoons could help toddlers feel less pain when receiving vaccinations. Whereas receiving their vaccinations, toddlers in the experimental group watched a cartoon on a laptop, whereas those in the control group did not get the intervention. “The calculated 't' value (8.83) was greater than the table value t=2.00, p0.05, and the results demonstrated that there was a significant difference between the pain scores of the experimental group and control group. As a result, the animated movie proved beneficial in reducing the discomfort that toddlers experienced after vaccination [7].

5. Association between level of behavioral response to pain among children during immunization in experimental group and control group with their selected baseline variables.

The present study findings showed that there is no association between level of pain among children in experiment group and control group and selected baseline variable. (Fisher exact test, p<0.001)

A type of quasi-experimental research was conducted at a few clinics in Manglore to examine the impact of using cartoons as a diversion technique on toddlers' (ages 1-3) behavioral reactions to discomfort during vaccines. 60 children made up the sample, and they were randomly assigned to the experimental and control groups after being selected using the purposive sampling method. The “FLACC behavioral pain assessment scale” was used to measure how children behaved in reaction to pain. The findings indicated that the experimental group, which was distracted by a cartoon movie, had significantly lower behavioral pain response scores than the control group. The difference was significant at the 0.05 level of significance, according to an unpaired t test (t (58) = 7.557, p0.05). Except for age, there was no correlation between the behavioral reaction to pain and any of the demographic factors [8].

Conclusion

The study concluded that the musical rotating toy is effective on behavioral response to pain in children receiving immunization.so it is important for nurses, who administer immunization, to alter the painful response as much as possible. nurses must meet the challenges in relieving response by distracting the children.

Conflicts of interest

None

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