

Effectiveness of Distraction Techniques upon Pain among Children receiving immunization.



Medical Science

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ABSTRACT

Immunization is a global health priority for every child. The majority of children show behavioral distress to pain while receiving immunization. Aim: To compare the effectiveness of distraction techniques upon pain among children (1-2 years) receiving immunization. Methodology: A quasi -experimental, post-test only control group design was adopted. Based on the inclusion criteria purposive sampling technique was used to select ninety children and equally divided in to three groups. Experimental group I received the distraction technique of sound producing toy, experimental group II received playing of familiar music and where as control group received the routine care. The acute pain observed and scored by using FLACC behavioral pain assessment scale and Wongs-Baker faces pain rating scale. Results: In Group I, 90 % children had moderate pain and 10% had severe pain. In Group II, 80 % children had moderate pain and 20% had severe pain where as in Group III (control group), nearly half of children (46.7%) had moderate pain and 53.3% had severe pain. Mean pain score in Group I was 10.63, 12.77 in Group II and 15.13 in Group III. The obtained 't' value is 8.49 and 4.49 which is significant at 0.001 level. Conclusion: Hence the percentage difference score was 22.50 in group I and 11.80% in group II reveals that toy distraction technique (group I) was effective than music therapy (Group II) in children receiving immunization.

Introduction

Children are precious to their family and as well as Nation. Immunization is a global health priority for every child. For Children, Routine immunization is an almost universal experience. Although it is a relatively minor painful procedure, the fear of the "shot" is widespread, fear of injection is most frequent in children and persists for 140/1000 people at age of 20. Immunization is little painful and most children while receiving immunization show behavioral distress to pain. A child's anxiety and fear of a procedure and actual pain experience during the procedure often are manifested by the child's distress behavior such as crying, flailing and refusal to co-operate. The child's distress is disappointing not only for the child but also for the adults involved, both parents and professionals and it often makes it more difficult to complete the procedure. Although hospitals are committed to provide health and wellness, children are frightened to come to the hospital and start crying at the sight of health personnel like nurses, as it makes their young mind to associate the hospital with the pain they had experienced during their precious visit of hospitalization. **Need for the study:**

The perception of pain depends on anatomic, physiologic and cognitive behavioral factors. Most of the children express their pain by means of cry, restless, kicking or legs drawn up, rigid or jerkin. Reducing pain is essential to healing. Pain that is not relieved promptly, it leads to anger and mistrust, emotional and sleep problems, and it may temporarily slow down a child's developmental progress. The pediatric nurses working in primary care settings, it is necessary for them to reduce pain and child distress during immunization. Treating the pain is essential with the help of non- pharmacological technique such as distraction which is has the property of analgesic effect for the toddlers who are receiving immunization injection or other invasive procedures. Distraction diverts attention from a noxious stimulus through passively redirecting the subject's attention or by actively involving the subject in the performance of diversion task. It involves capturing child's attention and focusing away from the stressful situation and to something more pleasant. So, the distraction was chosen as the primary intervention because it provides a simple approach in reducing pain and anxiety that has been effective in all settings, and requires only little training. In the present study the investigator compares two affordable and easily available distracters of toy and music in altering the behavioral responses to pain in children.

Statement of the Problem

"A study to compare the effectiveness of distraction techniques upon pain among children (1-2 years) receiving immunization."

Objectives of the study

1. Assess the level of pain among children receiving immunization in Group I, Group II & Group III.
2. Evaluate the effectiveness of distraction techniques among children receiving immunization in group I & group III, group II & group III.
3. Compare the effectiveness of distraction techniques among children receiving immunization in group I & group II
4. Associate the level of pain among children receiving immunization in group I, group II and their selected demographic variables.

Hypothesis

- H1: There will be a significant difference in the level of pain among Children, receiving Immunization in group I, group II and group III.
- H2: There will be a significant difference in the level of pain among Children receiving immunization in group I and group III.
- H3: There will be a significant difference in the level of pain among Children receiving Immunization in group II and group III.
- H4: There will be a significant difference in the level of pain among Children receiving Immunization in group I and group II.
- H5: There will be a significant association between the level of pain among Children in group I and group II & their demographic variables.

Materials and methods:

A quasi - experimental post-test only control group design was used in this study. It is composed of three randomly assigned groups but no pre-test was done. The study was conducted at pediatric immunization clinic, Institute of Child Health, Government Rajaji Hospital, Madurai, Tamilnadu,India. Based on the inclusion criteria, purposive sampling technique was used to select ninety children.

Research Design notation

Group	Intervention	Observation
E1	X1	O1
E2	X2	O2
C	-	O3

E1=Experimental group I Children receiving immunization (Sound producing toy)

E2=Experimental group II Children receiving immunization (Sun time theme music)

C = Group III (Control Group): Children receiving immunization without any Distraction.

X1- Experimental group received sound-producing toy as a distraction.

X2- Experimental group received music as a distraction.

O1, O2, O3 - Observation by FLACC behavioral pain assessment scale and Wong- Baker Faces pain rating scale.

Criteria for selection of sample:

The study samples were selected based on,

Inclusion criteria:-

1. Children who are healthy attended immunization clinic.
2. Children with 1-2 years of age.
3. Children who are eligible for DPT vaccination.
4. Mothers who were willing to co operate.

Exclusion criteria:-

1. Mothers who are not willing to participate
2. Physically and mentally challenged children.

2.3. Description of the Tool

The study tool consists of two parts

Tool- I: Demographic variables

Tool- II: a. FLACC behavioral pain assessment scale

b. Wong-Baker faces pain rating scale

Tool I: Demographic variables

The demographic variables consisted of age, sex, religion, relationship of the child with caregiver, level of education of care giver, child's weight, past experience to immunization / injection, position.

Tool II:

FLACC behavioral pain assessment scale

FLACC Behaviors pain assessment scale is a standardized tool developed by Merkel et al., 1997 (tested on Children in the age group of 2 months to 7 years). The acronym FLACC represents five categories Face, Legs, Activity, Cry and Consol ability. The pain was assessed using observation method responses in each category scored between 0 and 2 for a maximum total score of 10⁵.

Wong Baker Faces Pain Rating Scale

Wong-Baker faces pain rating scale is a standardized scale developed by Wong DL (1999). This scale is consists of six cartoon faces ranging from smiling face for "no pain" to tearful face for "worst pain". The pain was assessed using observation method responses in each category scored between 0 and 2 for a maximum total score of 10. The Overall score level of pain categorized as 0-7 – Mild, 8-14 – Moderate, and 15-20 – Severe⁵.

2.4. Data collection procedure

Ethical Clearance was obtained from Institutional Review Board (Ethics Committee). Necessary administrative permission and informed consent was obtained prior to the study. Based on inclusion criteria, purposive sampling technique was used to select the ninety samples. Among this, 30 samples allotted for experimental group-I, 30 for experimental group-II, and 30 for control group-III. The children in the Experimental Group I and

II were distracted by play material 2 minutes before giving the immunization, continued during the procedure (1min) and for 2 minutes after completing the procedure by the researcher. The overall time duration of 5-8 minutes was taken to collect the data of each sample in experimental group and routine care was given. Whereas children in the control group received immunization without any distraction and only routine care was maintained. The investigator observed and scored the child's response to acute pain by using FLACC behavioral pain assessment scale and Wong's-Baker faces pain rating scale. The data was collected and analyzed by using descriptive and inferential statistics.

3. Results and Discussion:

The results were discussed based on objectives:

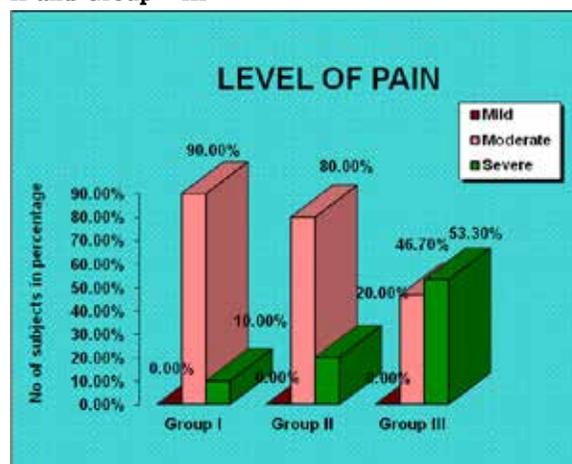
To assess the level of pain among children receiving immunization in group I, group II & group III.

The study results showed that 90% children had moderate pain and 10% had severe pain in Group I. In Group II, 80% children had moderate pain and 20% had severe pain. Whereas in Group III (control group) nearly half of children (46.7%) had moderate pain and 53.3% had severe pain. The Mean pain score in Group I was 10.63, Group II was 12.77 and Group III was 15.13. Hence the investigator proved the hypothesis H₁; There will be a significant difference in the level of pain among children receiving immunization in group I, group II and group III.

This study finding was supported by **Hockenberry and Wilson et al., (2007)** reported that brain perceives pain; there is a release of inhibitory neurotransmitters to hinder the transmission of pain and helps to produce on analgesic effect. This inhibition of the pain impulse is the fourth phase of the nociceptive process known as modulation. A protective reflex response also occurs with pain receptions. So while assessing pain intensity in children requires special techniques, therefore assessment requires using word such as owie, boo-boo. There are some unique tools available to measure pain intensity in children¹.

Figure 1: Distribution of samples according to the level of pain in Group I, Group-

II and Group – III



2. The second objective of the study was to evaluate the effectiveness of distraction techniques among children receiving immunization in group I & group III, group II & group III.

a. Regarding the comparisons of pain score in response to FLACC Behavioral pain assessment scale between group-I and group-III during the procedure.

Regarding physical response, 12 children (40%) showed frequent

to quivering chin, clenched jaw in Group I whereas in group-III (control group) 20 of children (66.7%) showed the frequent to quivering chin, clenched jaw. There is significant difference on pain score($X^2=4.28$) in Group-I and Group-III at $P \leq 0.05$ level.

Regarding verbal response, 11 children(36.7%) showed Crying steadily, screams or sobs, frequent complaints in group I whereas in Group-III(control group) 22 children(73.3%) showed Crying steadily, screams or sobs, frequent complaints during immunization. There is a significant difference on pain score ($x^2=8.14$) in Group-I and Group-III at $P \leq 0.01$ level.

Regarding Psychological response, 4 children (13.3%) showed difficulty to console or comfort during immunization shot in Group-I. But in group-III, 17(56.7%) of children showed difficulty to console or comfort during injection. There is a significant difference on pain score($x^2=12.38$) in Group-I and Group-III at $P \leq 0.01$ level.

b. Considering with the comparisons of pain score in response to FLACC Behavioral pain assessment scale between group-II and group-III during the procedure.

Regarding physical response, 23(76.7%) of children showed Squirming, shifting back and forth, tense in activity during immunization shot in Group-II whereas in group-III (control group) 50(50.0%) of children showed Squirming, shifting back and forth, tense in activity during immunization shot. There is a significant difference on pain score($x^2=4.59$) in Group-II and Group-III at $P \leq 0.05$ level.

Regarding verbal response, 9(30.0%) children showed Crying steadily, screams or sobs, frequent complaints during immunization shot in group-II whereas in Group-III(control group) 22(73.3%) children showed Crying steadily, screams or sobs, frequent complaints during immunization. There is a significant difference on pain score($x^2=11.27$) in Group-II and Group-III at $P \leq 0.01$ level.

Regarding Psychological response, 9(30.0%) of children showed difficulty to console or comfort during immunization shot in Group-II where as in group -III, 17(56.7%) children showed difficulty to console or comfort during injection. There is a significant difference on pain score($x^2=4.34$) in Group-II and Group-III at $P \leq 0.05$ level.

c). Revealing with the comparison of Wong - baker faces pain rating scale between group I, group II and group III.

In group I, The mean pain score is 4.40 and group III mean pain score is 7.13, the difference is 2.73. This difference is large ($t=9.45$) & it is statistically significant. The results revealed that children who received play therapy as distraction (Group-I) have moderate pain score than control Group (Group-III).

In group II (music therapy) the mean pain score is 5.73 and 7.13 mean pain score in group III (control group).The difference is 1.40. This difference is large ($t=5.76$) & it is statistically significant. The results revealed that children who received music therapy as distraction (Group-II) have moderate pain score than control Group (Group-III). Hence the researcher proved the hypothesis of H2 and H3 that there will be a significant difference in the level of pain among children receiving immunization in group I and group III and group II and III.

This result was supported by Cheryl. A. Gilbert et.al (1999) conducted videotaped study to determine the pain level based on facial expression to assess post operative pain in the age group of 13-74 months(N=48).Results demonstrated that face scale serve as a valid tool to assess persistent pain in young children⁸.

Table1: Depicts the Comparison of Wong - baker faces pain rating scale between group-I (toy distraction) group-II (music distraction) group-III (control group).

	Pain score		Student independent t-test
	Mean	SD	
Group I (toy distraction)	4.40	1.22	t=9.45 P=0.001*** df=58
Group III (control group)	7.13	1.01	
Group II (music distraction)	5.73	0.87	t=5.76 P=0.001*** df=58
Group III (control group)	7.13	1.01	

3. To compare the effectiveness of distraction techniques among children receiving immunization in group I, group II with group III.

Table 2: Comparison on effectiveness of overall pain score between group I, group II With group III.

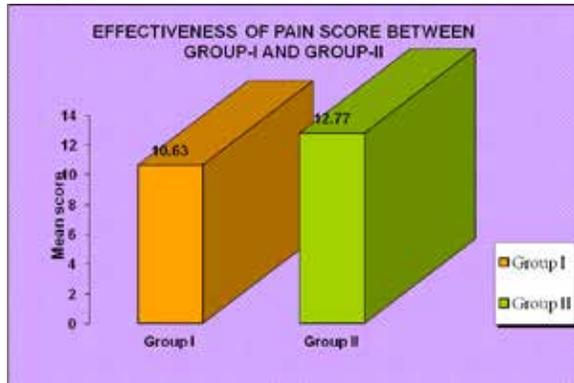
	Pain score		Student independent t-test	% of difference in pain
	Mean	SD		
Group I (toy distraction)	10.63	1.77	t=8.49 P=0.001*** df=58	75.65 -53.15 =22.50%
Group III (Control Group)	15.13	2.30		
Group II (music distraction)	12.77	1.73	t=4.49 P=0.001*** df=58	75.65- 63.85 =11.80%
Group III (Control Group)	15.13	2.30		

In group I, the mean pain score (10.63) is lower than the mean pain score of control group III (15.13). The obtained 't' value is 8.49 which is significant at 0.001 level. The percentage difference in pain score of 22.50 depicts that effectiveness of toy distraction. Whereas, the mean pain score in group II (12.77) was lower than the mean pain score of control group III (15.13). The obtained 't' value is 4.49 which is significant at $P \leq 0.01$ level. The percentage difference in pain score of 11.80 % reveals that effect of music therapy. Hence the percentage difference in pain Score is higher in group-I than Group-II which indicates that toy distraction technique is effective than music therapy in children receiving immunization. Hence the researcher proved the hypothesis (H4) there will be a significant difference in the level of pain among children receiving immunization in group I and group II.

The results were supported by Kleiber C (1999) who had done the meta analysis to investigate the effects of play distraction on children's pain and distress during medical procedures. Hunter and Schmidt's (1990) procedures were used to analyze 16 studies (total n = 491) on children's distress behavior and 10 studies (total n = 535) on children's pain. He measured the distress behavior, the mean effect size was 0.33 (+/-0.17), with 74% of the variance accounted for by sampling and measurement error. For pain, the mean effect size was 0.62 (+/-0.42) with 35% of the variance accounted for. Analysis of studies on pain that limited the sample to children 7 years of age or younger (total n = 286) increased the amount of explained variance to 60%. The author concluded that distraction had a positive effect on children's distress behavior⁹.

Loewy,J.V (1997) states that music distraction using live, familiar music with unusual instruments can be effective in capturing and holding the child's attention during painful procedure, such as needle punctures¹⁰.

Figure 2 : Comparison of pain score between Group-I and Group-II



4. The fourth objective of the study was to associate the level of pain among children receiving immunization in group I, group II and their selected demographic variables.

There was no significant association between demographic variables like age (in months), gender, position of the children during immunization, religion. Relationship of child with the care giver was presented during immunization in Group-I ($\chi^2=11.87$) and in Group-II($\chi^2=5.87$) was significant at $P \leq 0.01$ level. Child's past experiences to immunization/injection in Group-I ($\chi^2=6.80$) and in Group-II($\chi^2=5.13$) was significant at $P \leq 0.01$ level. Weight of the child in Group-I ($\chi^2=3.87$) and in Group-II($\chi^2=9.37$) were significantly associated with their level of pain at $P \leq 0.05\%$ level. Presence of mother accompanying the child, previous minimal resistance and children with more weight are having less pain than others. Control group (Group-III) level of pain is not significantly associated with their demographic variables. Hence the researcher proved the research hypothesis (H5) that there will be a significant association between the level of pain among children in group I and group II and their demographic variables.

Recommendation and Conclusion

Nurse's role in the health care arena is undergoing rapid changes. Nurses play a major role in the management of pain among children of all age groups. The nurses should practice the non-pharmacological pain reduction technique like behavioral methods, distraction techniques, guided imaginary, hypnosis, specific stress reducing counseling are all helpful in the management of pain among children. Pain is an unpleasant experience and the fifth vital sign which need to be assessed and managed appropriately. So treating the pain is essential with the help of non-pharmacological technique such as distraction which is has the property of analgesic effect for the toddlers who are receiving immunization injection and other invasive procedure. The present study concluded that the sound producing toy is effective than the music. Nurses need to reduce the pain by using different distraction techniques during painful procedure for children.

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