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## RESEARCH ARTICLE

### A STUDY TO ASSESS THE EFFECTIVENESS OF DIVERSION THERAPY ON PAIN AMONG INFANTS RECEIVING INJECTIONS AT SELECTED CLINICS OF MANGALORE

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#### ABSTRACT

Injections are the most painful procedures during childhood. To ensure adequate pain relief and to make pain more tolerable and to give the infants a sense of control over the situation, many pharmacological and non pharmacological strategies have been tried. As health professionals, various distractions like toys, music etc. can be used as diversion therapy to reduce the pain of infants receiving injections. The main purpose of the study was to assess the effectiveness of diversion therapy among infants receiving injection to help them to cope with pain. With experimental research approach quasi experimental post-test only control group design was used. The tools used were baseline proforma and Neonatal Infant Pain Scale. Using purposive sampling technique 60 samples were randomly assigned to control and experimental groups, 30 in each group. Samples in the experimental group were given diversion therapy before during and after the injection. The result showed that infants in the experimental group experienced less pain than that of the control. The study concluded that diversion therapy is effective and can be used by the paediatric health care professionals in their day today clinical practice to help infants cope with their pain.

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#### INTRODUCTION

Injections are the painful procedures performed on infants. It is assumed that such procedures cause a certain degree of pain. Unlike the widely held belief of the past years, today it is accepted that small children and even newborns are able to feel pain and respond to painful stimuli. The infant undoubtedly has the neuronal apparatus to detect a painful stimulus and perhaps remember it.<sup>1</sup>

According to guidelines published by the United States Centres for Disease Control and Prevention in 2005, children are to receive roughly 29 intramuscular injections by six years of age. These events are anxiety provoking and painful, especially for younger children, who exhibit higher distress than older children. It was also reported that as many as 45% of four- to six-year-old children experience 'serious or severe distress' during these procedures. In many cases, procedure-related distress is so severe that it results in escape behaviour (eg, kicking) and a need for child restraint.<sup>2</sup>

Pain is experienced by all and yet it is not easily understood by others who are not currently experiencing it, as it is a subjective experience and self-report is often considered the good standard of pain measurement<sup>3</sup> Pain is influenced by individuals sensory, affective, behavioural, cognitive, socio-cultural and physiologic components. Besides, there is no single acceptable instrument to measure the pain.<sup>4</sup> However, in many situations it is not appropriate or available for children.

In this context, observational methods that focus on non-verbal behaviour have a critical role in paediatric pain assessment. Behavioural observation is the primary assessment approach for pre-verbal and non-verbal children, and is an adjunct to assessment for verbal children. Observations focus on vocalisations (e.g., crying, whining, or groaning), verbalisations, facial expressions, muscle tension and rigidity, ability to be consoled, guarding of body parts, temperament, activity and general appearance. Adequate reliability and validity documentation is lacking for behavioural observations, even though clinicians often attribute greater importance to non-verbal expression than to self-report<sup>5</sup>.

To ensure adequate pain relief, or to make pain more tolerable and to give the children a sense of control over the situation, non-pharmacological methods are widely accepted as additional strategies that may be used independently or in addition to medication. When used in association with medical procedure, use an intervention before, during, and after the procedure. This gives the child a chance to recover, feel mastery and remember coping. Cutaneous stimulation, electroanalgesia, imagery, relaxation technique, hypnosis and distraction are common non-pharmacological techniques<sup>6</sup>.

Children respond to pain based on the type of pain, extent of pain, their age and developmental levels. Recent studies have reported that pain can be reduced with simple and benign interventions such as sweet oral solutions (sucrose or glucose) and non-nutritive suckling, breastfeeding, and multisensory stimulation.<sup>7</sup>

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Reaction of infants to pain varies.<sup>8</sup> The pain associated with injections is a source of anxiety and distress to children. At the same time, painful experiences in the early childhood period have the potential to affect long-term outcomes.<sup>9</sup>

During injection procedure it is commonly seen that infant's cry of pain emotionally upsets the mother and even the staff involved in the procedure. Thus, it is crucial to find methods to reduce pain when giving injections to small children.

For effective pain management prompt assessment of pain is essential. There are many behavioural pain assessment scales for children and the Neonatal Infant Pain Scale is proved to be effective for assessing the pain of children less than one year in Indian scenario as well.<sup>10,11,12</sup> Thus once the pain is assessed, providing atraumatic care to the children is the priority. This may eliminate or minimize psychological and physical distresses experienced by infants.<sup>13</sup>

Distraction is a non-pharmacological intervention that diverts attention from a noxious stimulus by passively redirecting the subject's attention or by actively involving the subject in the performance of the diversion task.<sup>7</sup> Distraction involves capturing the child's attention and focussing away from the stressful situation and towards something more pleasant. It takes little training to learn, is easy to administer, requires few materials, and is something familiar to most individuals. It is particularly useful for younger children. Examples of distracters used with children are picture books, toys, talking to the child, music, party blowers, kaleidoscope, prop up book, blowing bubbles, looking for hidden objects in the room, counting out loud, hand-held computer games, imagining fun and exciting things, or quiet and relaxing scenes.<sup>14</sup>

A study conducted in Turkey has revealed that looking through kaleidoscope can reduce perceived pain during venipuncture in healthy school age children.<sup>15</sup> Another study conducted at Pittsburgh revealed that combining oral sucrose, tactile stimulation, and parental holding was associated with significantly reduced crying in infants receiving multiple immunisation injections. Parents stated a strong preference for future use of these methods and nurses found the interventions easy to apply.<sup>16</sup>

The investigator from her experience has observed that children suffer from varying levels of pain during injections and distraction strategies are not used to pacify children during this painful procedure routinely. Hence the investigator felt the need of using a distracter as diversion therapy. It is important that the distracter should be cheap, easily available, easily usable without any additional training, and less time consuming so that it can be used easily in busy settings as well. Therefore in the present study, the investigator tried to assess the effectiveness of diversion therapy ie, bright colored sound producing rattle on pain among infants receiving injections to help them cope with the pain.

## OBJECTIVES

1. To assess the level of pain of infants in the experimental and control group during and after injection.

2. To assess the effectiveness of diversion therapy in the experimental group with those in the control group during and after injection.
3. To find association between the level of pain and selected demographic variables in both experimental and control group.

## MATERIALS AND METHODS

The study adopting an experimental approach, quasi experimental post-test only control group design, was conducted in a selected Primary Health Centre at Mangalore with the formal permission of the concerned authority. The study population comprised of children in the age group of 1 ½ -4 months who were undergoing parenteral immunisation. The sample size was 60 infants, 30 each in the control and experimental groups. Purposive sampling technique was used to select the sample. Tools used were Neonatal Infant Pain Scale (used with permission)<sup>17</sup> and the baseline proforma. The baseline proforma consisted 5 items, namely, age, gender, previous injections, order of birth, and gestational age. Neonatal Infant Pain Scale included 6 parameters namely facial expressions, cry, breathing patterns, arms, legs, and state of arousal. The parameters were categorised according to the responses. The findings were observed and graded correspondingly. The maximum score was 7 and minimum was 0. The scores were arbitrarily categorised as follows: Mild 0-2, Moderate 3-5 and severe 6-7.

With the consent from the parents (of the infants) to participate in the study, sample were taken for the injection. The independent variable (diversion therapy -bright colored sound producing rattle) was introduced into the experimental group prior to the injection. The parents were holding the infants, and the infants were encouraged to touch and hold the rattle. In the control group, the parents were holding the infants and giving standard care (cuddling, holding the baby close). The pain was observed by the investigator during and after the procedure.

## RESULT

Figure 1 to 4 shows the distribution of sample according to the age, gender, order of birth and gestational age.

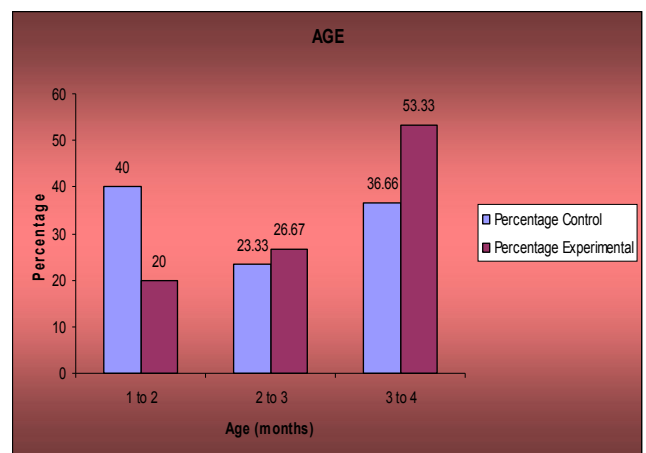


Figure 1 Bar diagram depicting percentage distribution of the sample according to their age

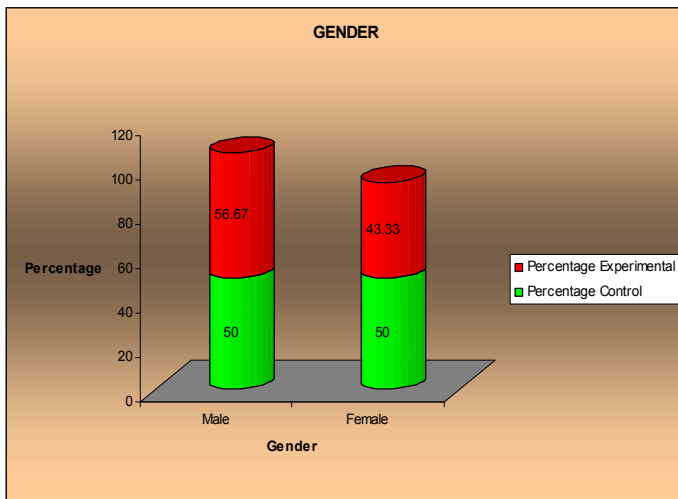


Figure 2 cylindrical diagrams depicting the percentage distribution of the samples according to gender

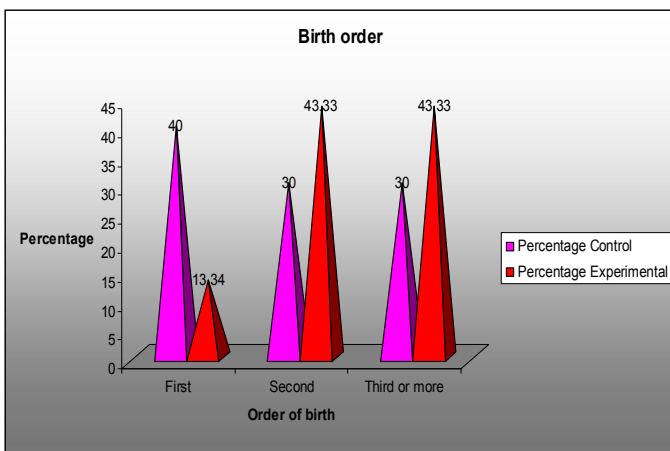


Figure 3 Cone diagram depicting the percentage distribution of samples according to the order of birth

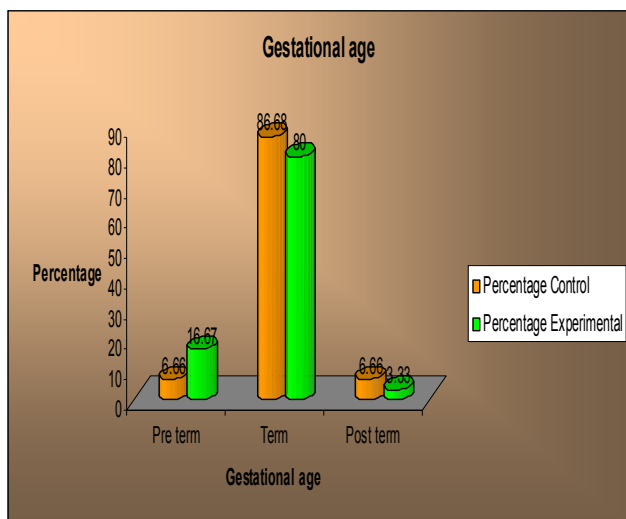


Figure 4 cylindrical diagrams depicting the percentage distribution of samples according to gestational age

The entire study sample experienced severe pain during injection but after the injection, majority of the samples (86.66%) in the control group experienced moderate pain and 13.34% experienced severe pain. In the experimental group

majority (83.34%) were found to have moderate pain and 16.66% experienced mild pain.

Table 1 Effectiveness of diversion therapy

Group	Mean	Standard deviation	Mean difference	Independent Group t test
Control	4.21	1.34	1.03	3.68*
Experimental	3.18	0.80		

t<sub>(27)</sub> = 2.05, p < 0.05; \* Significant

Table 1 shows the effectiveness of diversion therapy by comparing between the control and experimental group in the post injection pain level. It was found that the level of pain in the experimental group was lower than the control group. Computed Chi square test showed that there was no significant association between the level of pain and the demographic variables in both the control and experimental groups.

## DISCUSSION

The present study revealed that the pain during injection was severe in both control and experimental groups. Further it was found that there was a significant difference in the post injection mean pain score in the experimental group and the t value was highly significant. There was also significant difference in the post injection mean pain score between the control and experimental groups. Thus the diversion therapy was found to be effective in reducing the pain of infants receiving injection.

The present study findings were supported by a study conducted in Baltimore USA which results suggested that a developmentally appropriate multi-sensory variable distracting activity may be helpful in decreasing the pain.<sup>18</sup> And also by a study conducted at Ohio, which studied the effect of an active distraction technique, blowing out air on pain in preschool children receiving DPT in which study showed that the mean pain score in the experimental group was less than that of control group.<sup>19</sup> The present study findings are also consistent with the findings of the study conducted at Georgia which indicated that the children in the distraction group displayed less distractive behaviour during painful immunization<sup>20</sup>. The main limitations of study were the study was confined to a specific geographical area which obviously imposes limits to any larger generalisation. The study was confined to small number of subjects. However it could be done on more samples for larger generalization. Pain was assessed using only Neonatal Infant Pain Scale. Diversion therapy was given just prior, during and only for two minutes after the injection. The present study highlighted that diversion therapy is a highly significant complimentary alternative method in pain management. Further research is suggested to determine the effectiveness of age appropriate diversion therapy among children in reduction of different pains.

## CONCLUSION

Injections are the universal experience for children. Diversion therapy was found to be effective for reduction of pain of infants receiving injections. Therefore it can be used as a routine with immunisation so that infants' pain can be managed in an effective way. It is important for the health professionals, who administer immunisation, to take the challenge for relieving the pain by distracting the infants.

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