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Research Article

# An Efficacy of Cartoon Videos on Reducing Pain in Infants during Vaccination

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**Abstract**

**Background:** A majority of these injections are administered in the early periods of infancy. Uncontrolled pain experienced in early periods of life has a negative and long-lasting effect such as distress and can negatively affect the development of the central nervous system. Distraction is a method that increases pain tolerance by drawing attention away from the painful stimulus to other directions and is considered a powerful means of pain management in children. **Aim:** The aim of the study was to assess the pain perception during vaccination among infants in the experimental and control group and to compare pain perception among infants in the experimental and control group. **Materials and Methods:** This study was based on quasi-experimental research approach. The researchers used one group pre-test-post-test research design for the study. Non-probability convenient sampling technique was used to select 60 samples for the study in selected hospitals of Navi Mumbai. Structured questionnaire and Neonatal Infant Pain Scale were used for the data collection. **Results:** In control group, 60% of female and 40% of male infants and in experiment group, 50% of male and 50% of female infants wear present. Overall, mean pain score in the experimental group is 3.6333 and mean pain score in the control group is 5.7000. It is proven that cartoon videos are effective in reducing pain in infants during vaccination. **Conclusion:** This study concluded that cartoon videos are effective distraction strategy to reduce pain and distress among children during intramuscular injections. We can use same technique as a nursing intervention while giving care to children's in pediatric departments.

**Key words:** Cartoon videos, efficacy, infants, pain, vaccinations

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## Introduction

An infant is a human child from birth to the end of the 1st year of life. Emotional and physical needs at this time include love and security, a sense of trust, warmth and comfort, and feeding and sucking pleasure. All Infants undergo many painful procedures during their life as they are taking many immunizations.

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Pain is an uncomfortable sensation or feeling. Babies cannot tell us about their pain in words like older children, but they do give us clues by certain behaviors. Vaccination of children is must for the children and maximum injections are during infancy period itself. The route of hepatitis B vaccine is intramuscular route. In the current study, pain level of infants is assessed during intramuscular vaccination of hepatitis B. Intramuscular (IM) injection is a medical process, often accompanied by pain and distress in children. IM injection is a minor invasive procedure, but for children, it is also accompanied by pain, fear, and anxiety. Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Thus, the reduction of such pain and distress becomes the responsibility of health-care professionals to an extent as possible while maintaining patient safety using various pharmacological and non-pharmacological interventions.[1]

Pain assessment can have several functions. At minimum, it can be used to indicate the need for intervention, as well as to evaluate the effectiveness of treatments designed to

reduce pain. Furthermore, pain assessment is necessary to determine the associations between the levels of pain and other variables.[2] Distraction had a positive effect on children's distress behavior across the populations represented in this study. The effect of distraction on children's self-reported pain is influenced by moderator variables. Controlling for age and type of painful procedure significantly increased the amount of explained variance, but there are other unidentified moderators at work.[3] The pain associated with immunizations is a source of anxiety and distress for the children receiving the immunizations, their parents, and the providers who must administer them. Preparation of the child before the procedure seems to reduce anxiety and subsequent pain. The limited available data suggest that intramuscular administration of immunizations should occur in the vastus lateralis (anterolateral thigh) for children <18 months of age and in the deltoid (upper arm) for those >36 months of age.[4]

Health professionals have the responsibility of using various methods to manage painful procedures, to prevent long-lasting adverse effects of pain on children, and to reduce the emotional and physical effects of the painful procedures. Many pharmacological and non-pharmacological methods are used to control pain in children. Cognitive-behavioral non-pharmacological methods, including distracting attention, are feasible in acute pediatric pain management. Distraction is a method that increases pain tolerance by drawing attention away from the painful stimulus to other directions and is considered a powerful means of pain management in children. This is especially so in the first 7 years of life because it does not require advanced cognitive skills.[1]

A major myth among health-care professionals is that children cannot verbalize or describe pain so no need of treatment for pain but while they cannot verbalize their pain, behavior and vocalization are indicative of how they feel. Distraction is a technique designed to focus a child's attention away from a procedure by having the child concentrate on a particular object, singing, showing videos, and animated cartoon. Almost all children may enjoy viewing a videotape, such as a family-oriented or cartoon movie.[3] A study was conducted using parents as distraction coaches during intravenous insertion. Parent-child dyads were randomized onto two groups experimental and control group. The experimental group children showed decreased behavioral distress overtime than did the control group.[5] A study was conducted on management of injection pain in children. The study supported the use of music distraction in the reduction of injection pain in children.[6]

Challenges to the nurses who provide their care, cooperation of children during painful invasive procedures are very important. Nurses are in a unique position to improve the management of children's pain because children and parents will often tell them things they do not tell physician and they are often the professionals. Pain is often associated with fears, anxiety, and stress. A number of non-pharmacological techniques are available to reduce pain and distress with procedures such as techniques, distraction, deep breathing, blowing, suggestion, and superhero imagery. During our clinical experience, it was found that most of the infants experience pain during administration of vaccine and other invasive procedures and they used to cry for long time, it creates stress in infants as well as their parents. It has been reported that distraction strategies that use two senses (visual with audio) appear to be more effective in reducing pain than the use of either one alone; and content, intensity, and combinations of multisensory stimuli are important elements of distraction interventions.[7]

In busy immunization clinics, least consideration is given by the health personnel to reduce the pain experienced by the infant. The use of analgesia is not at all practiced during immunization. Many measures are there to reduce pain during invasive procedures, but cartoon videos are one measure which is more effective to reduce the pain, so the researcher felt to use this measure on pain management and decided to conduct a study to evaluate the effect of cartoon video on pain during administration of intramuscular vaccine.

### Statement

"An efficacy of cartoon videos on reducing pain in infants during vaccination in selected hospitals of Navi Mumbai."

### Objectives

The objectives of this study were as follows:

- To assess pain perception during the administration of IM immunization among infants in the experimental and control group.
- To compare pain perception during the administration of IM immunization among infants in the experimental and control group.

### Hypothesis

H1: Cartoon videos are significantly effective in reducing pain perception in infants during hepatitis B immunization.

## Materials and Methods

### Study design and setting

Quasi-experimental research design was used for this study. The study was conducted in the pediatric outpatient department. Immunization clinic was very busy as the number of patients is very huge.

### Sampling size and sampling method

In this study, population comprise 60 infants receiving hepatitis B vaccine. Non-probability convenient sampling technique was used to select samples. Sixty samples were selected, of which 30 in the experimental group and 30 in the control group. Infants who are receiving other

interventions to reduce pain before administration of IM immunization and infants with severe disability are excluded from the study.

### Data collection tool and technique

Self-administered questionnaire on demographic data and Neonatal Infant Pain Scale (NIPS) was used for the data collection in the infants. NIPS is having 6 items in the scale, i.e., facial expression, cry, breathing pattern, arms and legs movement, and arousal. A formal permission was taken from authority and consent was obtained from the participant parents. Experimental group infants wear shown cartoon videos while giving the intramuscular injections of hepatitis B vaccine. Pain level was assessed among experimental and control group with the NIPS. In that facial expression, cry, breathing pattern, arms and legs movement, and arousal were assessed. For control group infants, no any interventions were done. Only parameters were checked with the NIPS.

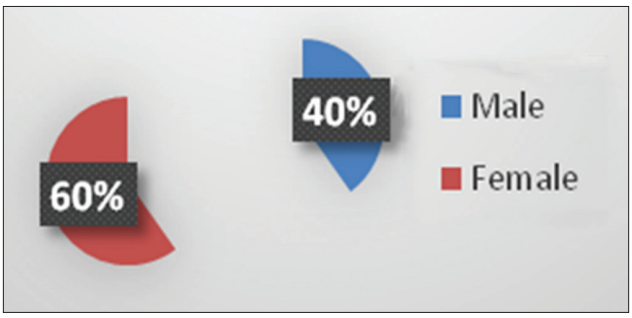


**Figure 1:** Data on gender distribution in the control group

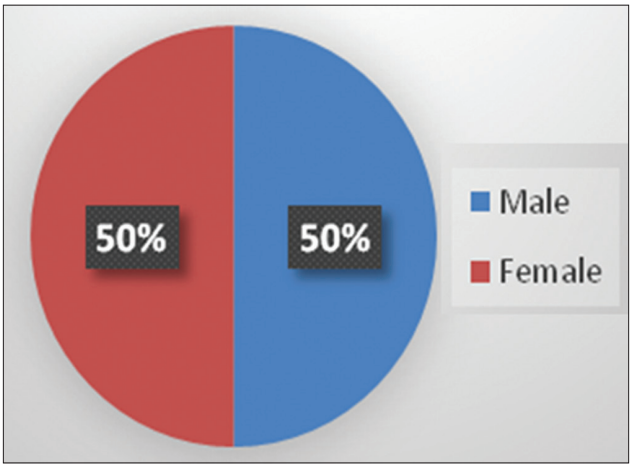


**Figure 2:** Data on gender distribution in the experimental group

### Statistical analysis

Statistical analysis was done using descriptive and inferential statistics. Data were collected, revised, coded, analyzed, and tabulated using number and percentage distribution.

## Results

### Section 1 – Sociodemographic variable

In the control group, majority of samples are females, i.e., 60% and 40% are males. In the experimental group, male and female samples wear 50% [Figure 1].

### Section 2 – Pain perception during IM immunization among infants in the experimental and control group

Total pain score in the experimental group was 117 and in the control group was 170. Facial expression score in the experimental group was 14 and in the control group score is 29; cry score in the experimental group was 23 and in the control group 30; breathing pattern score in the experimental group was 11 and in the control group 28; arms score in the experimental group was 23 and in the control group 27; leg score 25 and in the control group 28; and in aspect of arousal 21 and in the control group 28 [Figures 2 and 3].

### Section 3 – Pain score during IM immunization among infants in the experimental and control group

According to above data, mean pain score in the experimental group is 3.6333 and mean pain score in the control group is 5.7000. It is concluded that pain level in the experimental group is less than the control group. Hence, cartoon videos are effective strategy for the pain control among the infants. Hence, research hypothesis H1 is accepted in the study [Table 1].

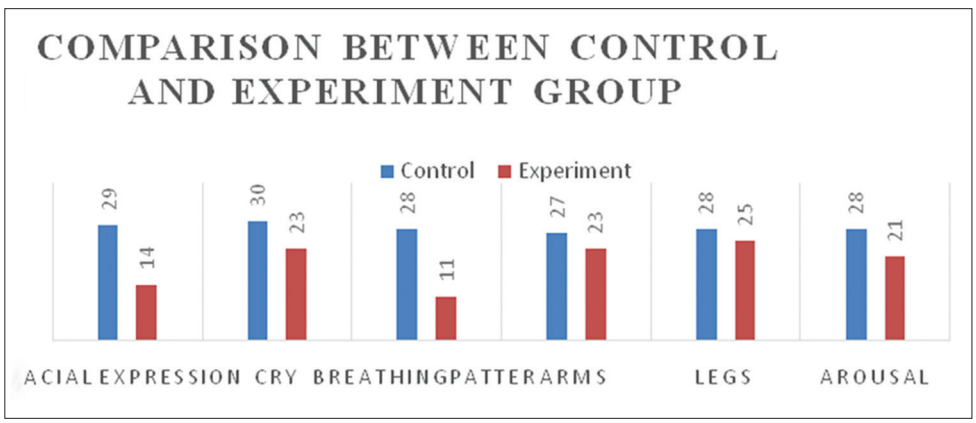


**Figure 3:** Data on pain perception in the experimental and control group

**Table 1:** Data on pain perception during IM immunization among infants in the experimental and control group

| Groups | *n* | Mean | Std. deviation | Std. error mean |
|---|---|---|---|---|
| Pain | | | | |
| Experimental | 30 | 3.6333 | 0.76489 | 0.13965 |
| Control | 30 | 5.7000 | 0.46609 | 0.08510 |

IM: Intramuscular

## Discussion

In the current study, overall pain score in the experimental group is 3.6333 and mean pain score in the control group is 5.7000. Facial expression score in the experimental group was 14 and in the control group score is 29; cry score in the experimental group was 23 and in the control group 30; breathing pattern score in the experimental group was 11 and in the control group 28; arms score in the experimental group was 23 and in the control group 27; leg score 25 and in the control group 28; and in aspect of arousal 21 and in the control group 28. It is proven that cartoon videos can be used as effective diversional therapy during intramuscular vaccination among infants.

Finding of the study is supported by the study conducted by Bellieni *et al*. to assess the analgesic effect of watching TV during venipuncture. Sixty-nine children aged 7–12 years were randomly divided into three groups: A control group (C) without any distraction procedure, a group (M) in which mothers performed active distraction, and a TV group (TV) in which passive distraction (a TV cartoon) was used. Main pain levels rated by the children were 23.04 (standard deviation [SD] 24.57), 17.39 (SD 21.36), and 8.91 (SD 8.65) for the C, M, and TV groups, respectively. Main pain levels rated by mothers were 21.30 (SD 19.9), 23.04 (SD 18.39), and 12.17 (SD 12.14) for the C, M, and TV groups, respectively. Scores assigned by mothers and children indicated that procedures performed during TV watching were less painful ($P < 0.05$) than control or procedures performed during active distraction.[8]

Talwar *et al*. conducted a quasi-experimental study to evaluate the efficacy of distraction technique in reducing level of pain among healthy children receiving vaccination at well-baby clinic in selected hospital, Ludhiana. Sample size of 200 healthy children using convenience sampling (100 in each group) was used. The standardized Face, Legs, Activity, Cry, Consolability – Behavioral pain assessment scale was used to observe level of pain among the healthy children during vaccination. A sound and light producing movable toy was used as distraction technique in experimental group during vaccination. Video recording of the children receiving vaccination was done and the pain score was calculated. Findings revealed that 7% of the children in experimental group as compared to only 1% in control group experienced no pain during vaccination. The mean pain score among experimental and control group was 4.02 ± 1.694 and 4.89 ± 1.503, respectively ($P < 0.001$). The distraction technique significantly reduces the level of pain in healthy children receiving vaccination ($P < 0.05$). Therefore, it is recommended that distraction technique should be used during every painful procedure among children.[9]

A study was conducted to examine nurse-directed distraction for reducing infant immunization distress. Ninety infants and their parents were randomly assigned to a distraction condition (i.e., nurses used stimuli to divert infant's attention) or a typical care condition. Results indicated that infants engaged in distraction and that distraction reduced their behavioral distress.[10]

### Nursing implications

As per the study proved, cartoon videos can be used to reduce the pain in infants during immunization as a diversional therapy and it can be accepted in nursing practice by the nurses. Cartoon videos can be used in our daily nursing care while giving care to the infants and children as it is proven effective and can be a nursing strategy to reduce pain among infants, not only in the IM injections but also to reduce pain in other invasive procedures.

### Recommendation

- A similar study can be replicated on large number of sample and in different setting to generalize the findings.
- Comparative study can be conducted to compare the effect of cartoon videos and other non-pharmacological measures.
- A study can be conducted to assess the perception of pain during invasive procedure.

## Conclusion

The research concluded that the cartoon videos are effective to reduce pain perception in infants during IM immunization and can be used as diversional therapy in the nursing for pediatric population.

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