

# “EFFECTIVENESS OF CARTOON VIDEO DISTRACTION IN ALTERING THE BEHAVIORAL RESPONSE TO VACCINATION PAIN AMONG TODDLERS IN SELECTED HOSPITALS IN NAVI MUMBAI”.

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## ABSTRACT

**Background & Aim of the work:** Vaccination is a public health measure used to fight infectious diseases. One of the most frequent and painful procedures performed on children is receiving a vaccine injection, especially when no pain medication is used. The researcher employed cartoon video as a distraction method in the current investigation. The study aims to discover whether cartoon videos could benefit toddlers (1 to 3 years old) in reducing their behavioral response to vaccination pain, who visit the pediatric outpatient department in selected hospitals in Navi Mumbai.

**Materials and Methods:** Purposive sampling was used to collect data using a quasi-experimental post-test group design. The study's 82 samples, of both sexes and between the ages of 1-3 years, were divided into experimental (41 samples) and control (41 samples). A randomized number generator was used to avoid bias in selecting the sample groups. The demographic interview questions and the FLACC Revised scale were employed as the study's instruments for assessing and observing the toddler's behavioral response to the process. Descriptive (frequency, percentage distribution) and inferential statistics were used in the data analysis (X<sup>2</sup> and Mann-Whitney U test).

**Results:** The study's findings showed that while comparing the pain score among the groups, the experimental group experienced a pain score of  $6.12 \pm 1.926$ , while the control group experienced a pain score of  $8.00 \pm 1.466$ , with a difference of 1.88. The intergroup comparison of pain among the experimental and control group showed a Mann-Whitney U test value of 0.000\*\*, which strongly showed a statistically highly significant difference between the two groups ( $p < 0.01$ ) with higher values in the control group as compared to the experimental group. An analysis of the relationship between pain intensity and demographic factors revealed a statistically significant relationship between children's prior experiences and their attitudes toward medical professionals. Hence the study has proven that cartoon video distraction is an effective distraction technique.

**Conclusion/Implication for Practice:** Cartoon video plays a major role in bringing joy and fun to the children. It helps in distracting the kids from an unpleasant stimulus or an unpleasant painful stimulus. This study had shown that the use of cartoon videos as a

diversion can significantly lessen the pain experienced by young children receiving vaccinations. Distraction techniques can be practiced in healthcare settings, as it allows the establishment of trust with the child and their family members, reducing the fear and anxiety towards vaccination, thereby increasing compliance towards the vaccination process.

**Keywords:** Cartoon video, Animation video, vaccination, behavioral response, pain, toddlers.

## INTRODUCTION & NEED OF THE STUDY

Vaccination plays a major role in one's health promotion and disease prevention. It is one of the most effective advances in pediatric medicine that helped in declining the morbidity and mortality of children especially under-five children from infectious diseases<sup>3</sup>. Vaccinations help in preventing certain diseases that threaten childhood<sup>4</sup>. Immunity is a state of having sufficient biological defenses in your body to fight off infections. Unlike adults, children have a weak immune system, so there is a huge need for vaccination to boost their immune system<sup>5</sup>.

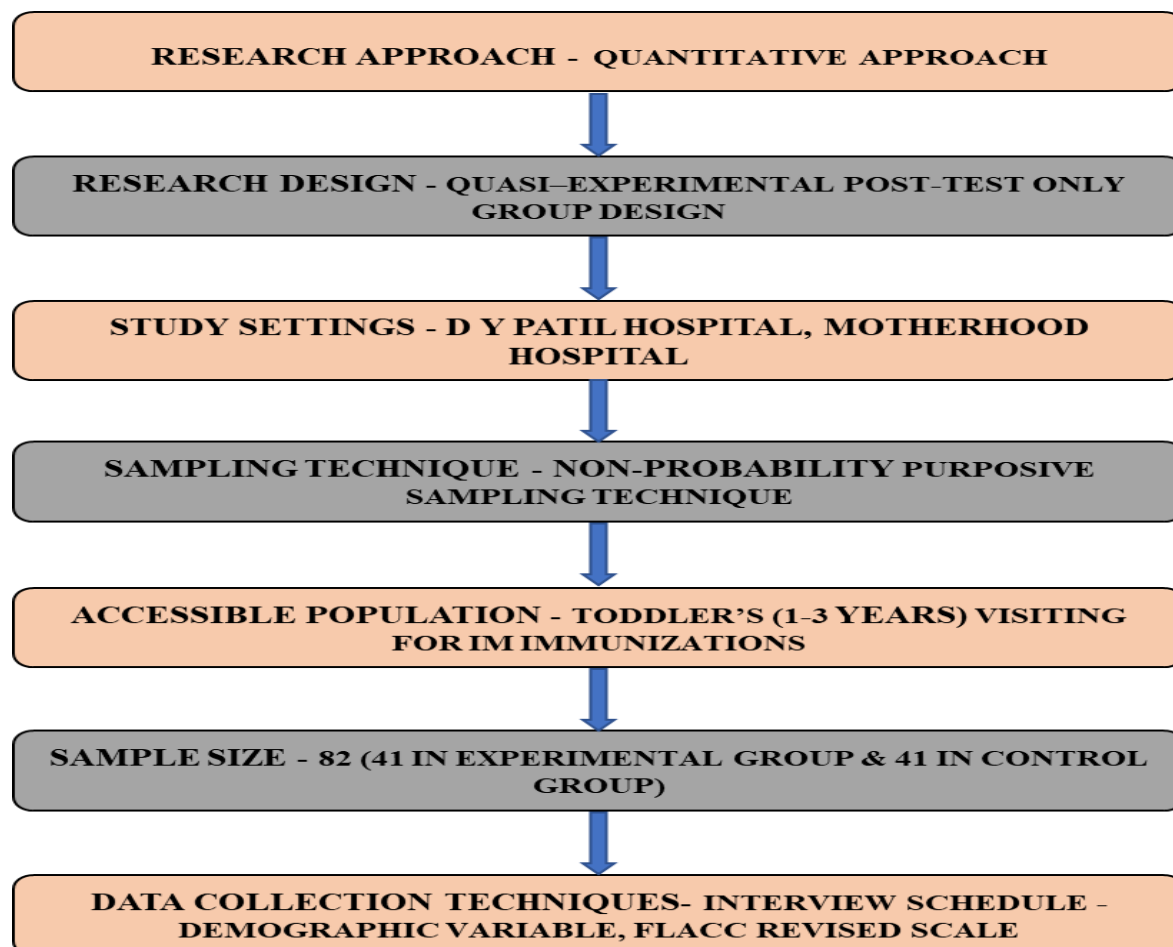
Recently, it has come to light that distracting young children during difficult operations may help them feel less pain<sup>3</sup>. Distraction is a non-pharmacological intervention that involves either actively engaging the subject in doing a diversion activity or passively diverting the subject's attention away from noxious stimuli. Distraction is the act of diverting a child's attention from a stressful situation and toward a pleasurable activity<sup>1</sup>. It requires minimal ingredients, is straightforward to administer, and is something that the majority of people are familiar with. Younger children really benefit from it. Picture books, conversing with the child, making the child listening to music, providing the child with party blowers, kaleidoscopes, pop-up books, blowing bubbles, moving toys, and cartoons are all examples of distracters used with youngsters<sup>3</sup>.

Pediatric nurses are crucial in helping children feel happier and less stressed because this can have an impact on their future development, attitude toward injections, and hospital stays. There is a huge need of bringing up such distraction techniques to make the child comfortable by altering their attention away from the painful stimuli.

Richa Talwar et.al (2014) conducted a quasi -experimental study design to evaluate the efficacy of distraction technique in reducing level of pain among healthy children receiving vaccination at a well-baby clinic in selected hospital, Ludhiana. A convenience sample size of 200 healthy children (100 in each group) was chosen. The standardised FLACC (face, leg, activity, cry, consolability) - Behavioural Pain Assessment scale was used to observe the level of pain among the healthy children during vaccination. In the experimental group, a sound and light producing mobile toy was used as a distraction tool during vaccination. The pain score was computed after video recording of the youngsters having vaccination. According to the data, 7% of children in the experimental group experienced no discomfort during vaccination, while only 1% of children in the control group experienced pain. The mean pain scores in the experimental and control groups were  $(4.02 \pm 1.694)$  and  $(4.89 \pm 1.503)$ , respectively ( $p < 0.001$ ). As a result, the researcher concluded that using distraction to reduce pain during immunisation in healthy children is an effective measure in reducing pain<sup>5</sup>.

## MAERIAL & METHODS

The purpose of the current study was to determine how well cartoon video distraction could change toddlers' behavioral reactions to pain during vaccinations. After receiving approval from the D.Y.Patil University School of Nursing's ethical committee, the suggested study was carried out. The participants' parents or guardians provided their written approval. The goal of the study's execution and its methodology were described. Throughout the whole investigation, the respondent's anonymity was preserved. A post-test only, quasi-experimental group design was employed. Purposive sampling was used to choose the study samples. In order to avoid bias, random number generator was used to allot samples in both the groups. According to inclusion and exclusion standards, the samples were chosen. The toddler was asked to lie down on the table or sit on the mother's lap after the group's presence was confirmed. After the youngster was made comfortable, the video was played three times: two minutes before, two minutes during, and two minutes after the vaccination. The vaccinations were given by nurse/physicians based on the hospital protocol. Modified FLACC Scale was used to assess the child's behavioural response to pain. For the children in control group, they were made comfortable, and no intervention was given during the vaccination procedure, only their behaviour was recorded using Modified FLACC Scale. The whole process included 10-15 minutes for each participant. After completion of study, the researcher had thanked the respondents for participating in the study. The researcher visited two Vaccination OPD's for collecting the required data. Once the data was collected, data was analyzed statistically. [Figure1]



**Figure 1: Schematic representation of research plan****RESULTS****SECTION – A: Description of Demographic Variable of respondents in Experimental and Control Group**

- Majority (65.8%) of the samples were between the age group of 12 to 18.5 months
- Majority of the samples (53.65%) were male
- Majority of the samples (37.8%) had received DPT booster, (29.20%) had received Typhoid vaccines and (20.7%) had received other IM vaccines.
- Highest percentage (53.65%) of the children had showed minimal resistance to previous vaccinations.

**Section B: Behavioural Response to Pain among the respondents in Experimental and Control Group**

The behavioural response to pain was more pronounced in the legs (mean percent = 69.5%), followed by crying (mean percent = 61%), activity (mean percent = 60%), consolability (mean percent = 58.5%), and the face (mean percent = 38.3%), according to Table Ia, which deals with the area-wise mean percentage distribution.

**Section C: Level of Vaccination Pain response of respondents in Experimental Group and Control Group**

Majority of the samples in Experimental group (60.9%) experienced moderate pain and in control group (29.2%) were having severe pain, whereas (87.80 %) experienced severe pain during vaccination. [Table II]

**Table I a: Mean Percentage description of level of behavioural response to pain among toddlers during vaccination procedure in Experimental Group**

N=82

Experimental Group					
Item	Max. Possible Score	Range	Mean	Standard Deviation	Mean %
Face	2	0-2	1.15	0.573	38.3
Leg	2	0-2	1.39	0.586	69.5
Activity	2	0-2	1.20	0.511	60
Cry	2	0-2	1.22	0.525	61
Consolability	2	0-2	1.17	0.381	58.5

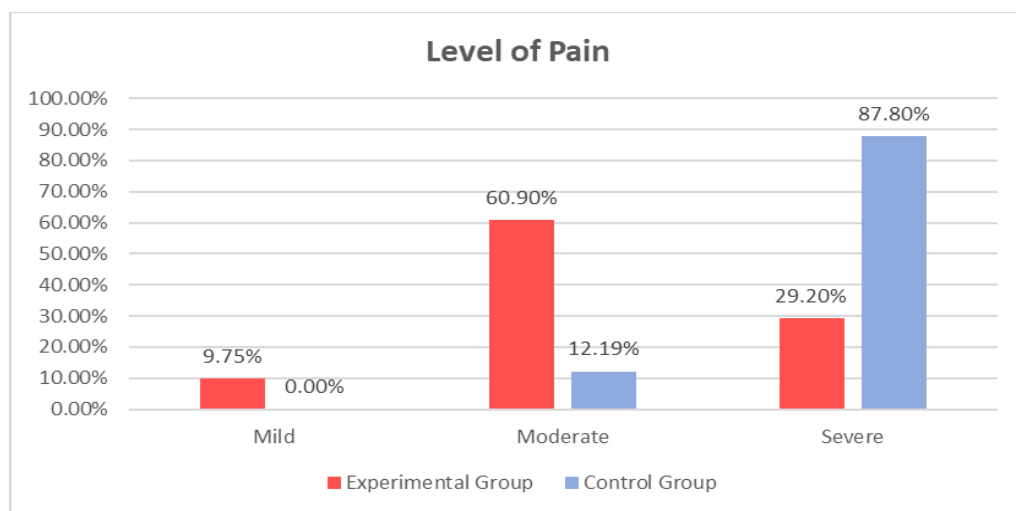
**Table I b: Mean Percentage description of level of behavioural response to pain among toddlers during vaccination procedure in Control Group**

N= 82

Control Group					
Item	Max.Possible Score	Range	Mean	Standard Deviation	Mean %
Face	2	0-2	1.24	0.435	62
Leg	2	0-2	1.78	0.419	89
Activity	2	0-2	1.63	0.488	81.5
Cry	2	0-2	1.78	0.419	89
Consolability	2	0-2	1.56	0.502	78

**Table II: Frequency and Percentage Distribution of Level of Vaccination Pain among Experimental Group and Control Group**

Level of pain	Experimental Group		Control Group	
	N	%	N	%
Mild	4	9.75%	0	0
Moderate	25	60.9%	5	12.19%
Severe	12	29.2%	36	87.80 %
Total	41	100%	41	100%



**Figure 2: Level of behavioral response to pain among toddlers in experimental and control group.**

### SECTION – D: Intergroup comparison of the Effectiveness of Distraction Techniques on Pain among the respondents in Experimental and Control Group

Considering Inter -group comparison of vaccination pain scores among experimental and control group, experimental group had a mean pain score of  $6.12 \pm 1.926$ , whereas control group showed a mean pain score of  $8.00 \pm 1.466$  score, with a difference of 1.88. The data was statistically analyzed using non-parametric test. Normality of numerical data was checked using Shapiro-Wilk test & was found that the data did not follow a normal curve; hence non-parametric tests have been used for comparisons. Hence Mann-Whitney U test was used for statistical analysis. The intergroup comparison of pain among experimental and control group showed a Mann-Whitney U value of 378.500, Z test of 4.348 and Mann-Whitney U test value of 0.000\*\*. There was a statistically highly significant difference seen for the values between the groups ( $p < 0.01$ ) with higher values in control group as compared to experimental group, which states the children in experimental group experienced lesser pain compared to the children belonging to control group. [Table III]

**Table III: Comparison of level of pain among Experimental and Control Group**

Group	N	Pain score Mean $\pm$ Std. Deviation	Std. Error Mean	Median	Mean rank	Mann-Whitney U value	Z test	Mann-Whitney U test
Experimental	41	$6.12 \pm 1.926$	0.301	6	30.23	378.5	4.348	0.000**
Control	41	$8.00 \pm 1.466$	0.229	8	52.77			

Note:

\* = statistically significant difference ( $p < 0.05$ )

\*\* = statistically highly significant difference ( $p < 0.01$ )

# = non-significant difference ( $p > 0.05$ )

### SECTION – E: Association between level of pain and demographic variable among the respondents in Experimental and Control Group

In this section, the association between the levels of pain with demographic variables between experimental group & control group has been done and the association has been done using chi-square. Significant association at 0.05 level of significance was seen between demographic variables and child's previous reaction to pain and between the demographic variables and for child's reaction on seeing health personnel. [Figure 2, Figure 3]

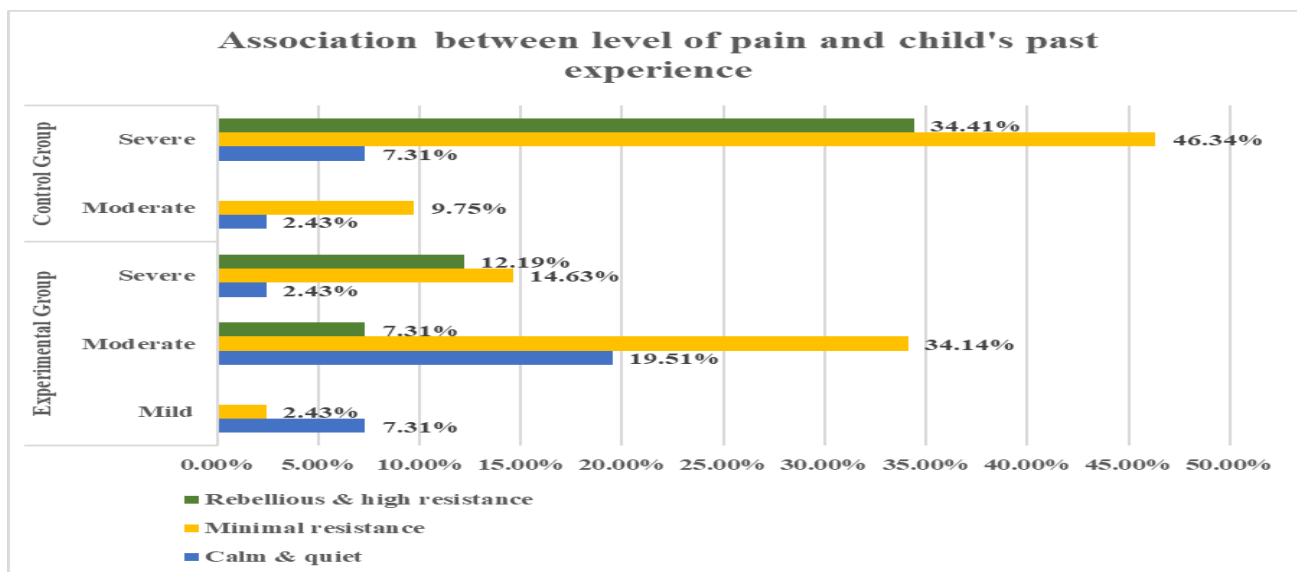


Figure 3: Association between level of pain and child's experience in Experimental and Control Group.

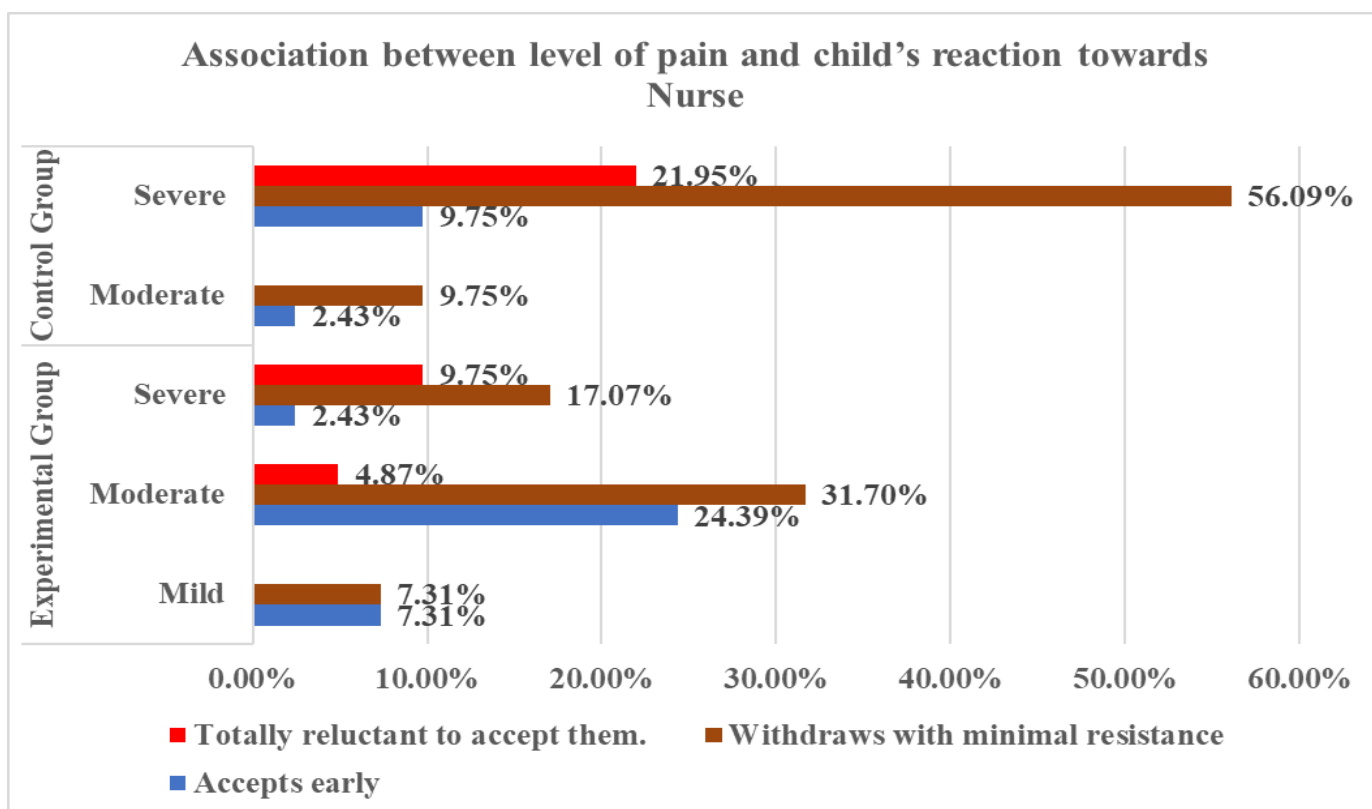


Figure 4: Association between level of pain and child's reaction towards Nurse (Experimental & Control Group).

**DISCUSSION**

Vaccination had become a part of child's life. Even though it protects the child from many diseases, it has become a stressful situation for parents and children. Distraction

techniques are effective, easy, and economical methods which can be used to reduce procedural pain and anxiety, as it diverts the focus of attention from the stimuli. The current study was focussed on the use of cartoon video as a distraction in reducing the toddler's pain from vaccination shots.

In the present study, majority of the respondents belonged to the age group between 12 -18.5 months, (65.85%). Majority of the respondents were male child (53.65%). These findings were supported by the studies done by Gedam D. S et.al (2013) and R.Ganeshan et.al (2015). In the present study, highest percentage (37.80%) of children had received DPT, 29.26% had received Typhoid vaccine & 32.93% had received other vaccines (Pneumococcal vaccine). This study findings were consistent with the study done by Gedam D. S et.al (2013) in which majority (80%) had received DPT vaccines & 20% had received other vaccines. In the current study area wise mean percentage distribution of FLACC parameters (Face, Leg Activity, Cry, Consolability) has been done, to find out which parameter has been affected the most among experimental and control group and it was found that legs (69.5%) were the most affected parameter among experimental group, whereas children in the control group showed higher area wise response towards the parameters – Leg and cry (89%) in both. Similar findings were found in a study done by Bijimol et.al (2020).

The findings of the present study revealed that while comparing the pain score among both the groups, Experimental group experienced a pain score of  $6.12 \pm 1.926$ , while Control group experienced a pain score of  $8.00 \pm 1.466$ , with a difference of 1.88, which shows that children in the experimental group had experienced lesser pain compared to the control group, thus cartoon video distraction has been proven to be effective in reducing vaccination pain in toddlers. The results of a study conducted by Bijimol NJ et al. (2020) were used to support the findings of this study. In that study, the mean score of behavioural response to pain for Group II (control) was higher ( $10.97 \pm 1.69$ ) than for Group I (experimental) ( $7.17 \pm 1.206$ ), demonstrating that cartoon video distraction is an efficient non-pharmacological and cost-effective diversional technique that has a positive impact on children's distress behaviour and pain while having no adverse effects on toddlers.

In the present study, Intergroup comparison of the effectiveness of the cartoon -video distraction technique was done using Mann -Whitney U test. Normality of numerical data was checked using Shapiro-Wilk test & it was found that the data did not follow a normal curve; hence non-parametric tests have been used for comparisons. The intergroup comparison of pain among experimental and control group shows a Mann-Whitney U value of 378.500, Z test of 4.348 and Mann-Whitney U test value of 0.000\*\*, which strongly showed a statistically highly significant difference between the two groups ( $p < 0.01$ ) with higher values in control group as compared to experimental group, which showed that the children in experimental group experienced lesser pain compared to the children belonging to control group. This study findings were supported by a study done by Susan Mahajan et.al (2017), Mann Whitney U test, Z value was used for inter group comparison, whereas, in another study done by R.Ganesan et.al (2015), inter group comparison was done using student independent t-test. Hence the researcher concluded that cartoon video plays a major role in distracting the children from vaccination pain.



## CONCLUSION

Pain is an unpleasant sensation and the fifth vital sign that must be properly analysed and handled. Anatomic, physiologic, and cognitive behavioural variables all influence pain perception. The majority of youngsters exhibit their pain by crying, becoming restless, kicking, or drawing their legs up, tense, or jerking. As a result, addressing pain with non-pharmacological strategies such as distraction, which has an analgesic effect for toddlers getting vaccination/ injection or other invasive procedures, is critical. Other non-pharmacological techniques, such as touch guided imagining, hypnosis, and others, can assist children in lowering their pain perception. A number of studies have shown that distraction can help young children to cope with discomfort. As professional nurses, we must alleviate pain in children by adopting various distraction tactics during painful operations as a procedural intervention.

## LIMITATION

Present study has some limitations:

- There were just 41 samples in each group, making the study's sample size limited. Therefore, generalisation is only possible for the chosen samples.
- Researcher was unable to keep the same healthcare personnel with same experience throughout the study, which impacts the study findings.

Despite of these limitations, cartoon video distraction technique showed a promising effectiveness in the reduction of vaccination pain.

## Implication for Nursing Practice

- Nurses have a significant role in the treatment of pain in children of all ages, and their place in the medical field is fast evolving.
- The child's care plan should include a pain assessment. As a result, nurses should use a standardised pain assessment method to measure the pain of children based on their age and developmental level.
- Nurses who work in pediatric wards should encourage parents to employ distraction techniques to help their children cope with the discomfort of a minor operation. It is simple to carry out and requires little maintenance.

## Implication of Nursing Education

- A strategy and a plan for adding distraction techniques as one of the children's pain management options can be developed by the nurse administrator.
- Healthcare workers at various levels should get in-service education on the management of pain in children using non-pharmacological approaches, as well as simple and effective distraction tactics.
- Through workshops and conferences, nurses can keep up to date on contemporary pain practise and therapy. This will allow them to successfully deliver care using a comprehensive approach.

### Recommendation

- Further research into distraction tactics will serve to enhance the facts and promote the children's well-being by lowering their suffering while in the hospital for a difficult treatment.
- A similar study with large samples and varied demographic variables can be conducted.
- To strengthen the findings, the study might be reproduced in diverse situations.
- In the hospital's paediatric care setting, research can be done to assess the staff nurses' expertise, attitudes, and practises regarding non-pharmacological pain management.

**Conflict of Interest:** There are no conflicts of interest.

**Author's Contributions:**For the research concepts, design, data collecting, and analysis, Miss Nimi Susan Thomas, Prof. Deepa Reddy and Prof. Dr Rita Lakhani, and are responsible.

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