



## A comparative study to assess the effectiveness of cartoon videos vs. bubble blowing during cannulization on pain perception among children admitted at selected Hospital Bilaspur Chhattisgarh

<sup>1</sup>Mona, <sup>2</sup>Dr. Rachana Abraham and <sup>3</sup>Soniya Dewangan

<sup>1</sup>M.Sc. Nursing Final Year, Department of Child Health Nursing, Government College of Nursing, Bilaspur, Chhattisgarh, India

<sup>2</sup>Associate Professor, Department of Child Health Nursing, Government College of Nursing, Bilaspur, Chhattisgarh, India

<sup>3</sup>Demonstrator, Department of Child Health Nursing, Government College of Nursing, Bilaspur, Chhattisgarh, India

DOI: <https://doi.org/10.5281/zenodo.14912308>

Corresponding Author: Mona

### Abstract

**Introduction:** Pain continues to be the most complex and challenging sensory emotions in the life of children. It is defined as a universal unpleasant, subjective, sensory and emotional human experience. hospitalization expose children to unfamiliar and unpleasant feelings. Since children have little experience with and comprehension of the pain and disease process, such negative feeling can cause intimidation and anxiety for them. Children requiring needle stick such as injections. IV cannulization and blood sampling view these procedure as freighting and is a significant source of pain. So, to know which distraction techniques used with the pre-school age group are mostly passive. Cognitive strategies used to reduce pain perception in children are either visual or auditory interventions. The researcher had chosen this study i.e "A comparative study to assess the effectiveness of cartoon videos vs. bubble blowing during cannulization on pain perception among children admitted at selected Hospital Bilaspur Chhattisgarh".

### Objective of the study

1. To assess the level of pain in children during cannulization in Experimental group1 (cartoon videos) and Experimental group 2 (bubble blowing).
2. To compare the effectiveness of cartoon videos and bubble blowing on pain perception during cannulization among children.

**Conclusion:** This study conclude that cartoon videos were more effective in relieving pain perception during cannulization.

**Keywords:** pain perception, cartoon videos, bubble blowing, cannulization

### Introduction

"Bitter are the tears of a child: sweeten them.  
Deep are the thoughts of a child: quiet them.  
Sharp is the grief of a child: take it from him.  
Soft is the heart of a child: Do not harden it."

PAMELA

Children are a vulnerable group and their wellbeing should always be a priority <sup>[1]</sup>. Nevertheless, children have historically been exposed to many medical procedures and treatments without any analgesics since researchers claimed that small children did not feel any pain <sup>[2]</sup> despite the fact that the definition of pain is "a subjective, emotional, and unpleasant sensory experience" <sup>[3]</sup>. Children who had been

exposed to painful procedures without pain-relieving medication were found to have higher levels of stress hormones compared to those who had received medication <sup>[4]</sup>. Research has also shown that children who have experienced pain early in life may give a stronger response later in life when they for example receive a vaccination, as compared to children who have not experienced pain early in life and thus don't have a similar "pain memory" Many children are inpatients at hospitals. have not experienced pain early in life and thus don't have a similar "pain memory" <sup>[5]</sup>. Many children are inpatients at hospitals worldwide and several recently published studies have shown that children experience pain during hospital stay. According to a study by Kozlowski *et al.* children at

surgical wards have reported more pain compared to children at medical wards. Furthermore, two studies have reported that children experience a fear of pain [6].

### Need of the study

On the basis of my clinical experience and literature review I felt that children are often exposed to painful procedure on admission to hospital. One such common procedure is cannulization procedure which is very painful to children. Thus I am interested to emphasize on the measure of pain relief by cartoon video and bubble blowing to reduce pain among children during cannulization. Considering all the above mentioned facts I found it is very essential to conduct this study. Hence the particular is selected for research.

Children often experience unpredictable and severe procedure related pain in hospitals. Maximum procedures that are performed to cure illness among children are traumatic, painful, upsetting and frightening to children. Unfortunately, attempts to minimize pain because of medical intervention, have not kept pace with technologic advances in pediatric care. Hospital children undergo multiple painful procedure, venipuncture, intravenous cannulation, capillary stick and injections are most commonly performed. Venipuncture is one of the most commonly experienced procedures. Cry hospitalized children. Disease and hospitalization can be the first crisis that a child encounters. Hospitalization exposes children to unfamiliar feelings. Since children have little experience and comprehension of the pain and disease process, such negative feeling cause intimidation and anxiety for them.

### Statement of the problem

“a comparative study to assess the effectiveness of cartoon videos vs. bubble blowing during cannulization on pain perception among children admitted at selected hospital bilaspur (c.g.)”

### Objectives of the study

1. To assess the level of pain in children during cannulization in Experimental group 1 (cartoon videos) and Experimental group 2 (bubble blowing).
2. To compare the effectiveness of cartoon videos and bubble blowing on pain perception during cannulization among children.

### Hypotheses

- **H<sub>0</sub>:** There will be no significant difference between the effect of cartoon video and bubble blowing on pain Perception among children during cannulization.
- **H<sub>1</sub>:** There will be significant difference between the effect of cartoon video and bubble blowing on pain Perception among children during cannulization.
- **H<sub>2</sub>:** Cartoon video will be more effective than bubble blowing on pain Perception during cannulization among children.

### Operational Definitions

**Effectiveness:** In my study it refers to degree in reducing the level of pain perception in children who are undergoing IV cannulization.

**Cartoon Videos:** In my study the process of showing

cartoon video animations to the preschooler age children by the use of mobile.

**Bubble Blowing:** In my study bubble blowing is a passive distraction in which air will be blown to the soap water to make the bubbles.

**Pain:** In my study, it refers to unpleasant sensory or emotional experience during cannulization.

**Perception:** In my study it is the percentage in feeling of pain during IV cannulization usually measured by FLACC scale reading.

**Intravenous Cannulation:** In my study, it is the putting of tube into the school age children's vein for administration of fluids, medications etc.

**Children:** In my study, it refers to those boys and girls between the age of 4-7 year admitted in the selected hospital at bilaspur.

### Variables Under Study

#### Independent Variable

- Cartoon videos
- Bubble blowing.

**Dependent Variable:** Pain Perception.

#### Inclusion Criteria

- Children of both the sex.
- Children age for 4-7 years.
- All children who are (i.e. able to respond to painful stimuli).
- All children who are admitted in pediatric ward at Bilaspur.

#### Exclusion Criteria

- Child with a neurodegenerative disease, mental retardation, vision and hearing
- problems, chronic life threatening (sepsis, shock, respiratory / cardiac arrest).
- Child with use of opioids, narcotics, analgesics sedatives in the last 24 hours before the procedure.

#### Limitations

- The subjects are limited to children age group 4-7 years.
- The sample size was limited to pediatric ward only 60 samples.
- Limited to the children who are cannulization.

#### Theoretical Framework

**Gate control theory of pain:** The most widely used and accepted theory is that of Melzack & Wall, (1965). These researchers have established that gentle stimulation actually inhibits the sensation of pain. Their gate control theory states that a neural or spinal gating mechanism occurs in the substantial gelatinous of the dorsal horns of the spinal cord. The nerve impulses received by nociceptors, the receptors for pain in the skin and tissue of the body, are affected by the gating mechanism. It is the position of the gate that

determines whether or not the nerve impulses travel freely to the medulla and the thalamus, thereby transmitting the sensory impulse or message, to the sensory cortex. The pain impulses will be carried out by the small diameter slow conducting A-delta and C fibers. Impulses travelled through small diameter fibers will open the ‘pain gate’ and the person feels pain. Pain gate is also receiving impulses produced by stimulation of thermo receptors or mechanoreceptors transmitted via large diameter; myelinated A-delta fibers inhibit superimpose the small diameter impulses [7].

If the gate is closed, there is little or no conduction, for example distraction, counselling and cartoon videos vs bubble blowing are ways to release endorphins, which close the gate. This prevents or reduces the client’s perception of pain. If the gate is open, the impulses and messages pass and are transmitted freely. Therefore, when the gate is open, pain and sensation is experienced.

Many non pharmacological procedures such as cartoon videos and bubble blowing (distraction), during

cannulization, TENS and movement stimulate the nerve endings connected with large diameter fibres which can produce a reduction of pain by closing the pain gate. Based on the principle of gate control theory, the following conceptual framework was developed. Methods used to reduce pain are influenced by selected socio demographic variables such as Age, Order of Birth, Education, Religion, Type of family, History of previous Cannulization, Temperature of child, Size of cannula, site of cannulization.

**Methodology**

Research design selected for this study is comparative experimental research design. The present weds to compare the effectiveness of cartoon videos vs. bubble blowing during cannulization on pain perception among children.

**Comparative Interventional**

The research design adopted for this study is quasi experimental, comparative study.

**Table 1:** Comparative Interventional

Group	Intervention	Post-Test
<b>Group-1</b> Assessment of cartoon videos during cannulization on pain perception	Showing cartoon videos show in the experimental group-1	<b>Group-1</b> Assessment of cartoon videos during cannulization on pain perception
<b>Group-2</b> Assessment of bubble blowing during cannulization on pain perception	Showing bubble blowing show in the experimental group-2	<b>Group-2</b> Assessment of bubble blowing during cannulization on pain perception

The main focus of the study was to reduction of during cannulization on pain perception by comparing cartoon videos vs. bubble blowing through post-test which are depicted as O1 & O2 respectively. The variable administered was showing of the cartoon videos vs. bubble blowing during cannulization on pain perception among children. the schematic representation of research study design used by the investigation is given below.

**Table 2:** Comparative Research Design

Group	Intervention	Post-Test
<b>Experimental Group- 1</b> Showing cartoon videos	X1	O1
<b>Experimental Group- 2</b> Showing bubble blowing	X2	O2

**Schematic representation of research desing**

**Key**

- O1- post-test pain perception during cannulization in the experimental group 1.
- O2- post-test pain perception during cannulization in experimental group 2.
- X - Intervention by showing cartoon videos show in the experimental group 1.
- X - Intervention by showing bubble blowing show in the experimental group 2.

**Description of instrument**

The tool was used under two section.

**Section A**

Demographic data of children which involves age, sex, education status, religions, type of family, number of sibling, previous history of cannulization during hospitalization, temperature of child, size of cannula, site of cannulization.

**Section B**

Standardized tools were used to assess the pain.

**FLACC pain rating scales**

FLACC is a behavioral pain assessment scale used for nonverbal or preverbal patients who are unable to self-report their level of pain. Pain is assessed through observation of 5 categories including face, legs, activity, cry, and consolability.

The FLACC scale or Face, Legs, Activity, Cry, Consolability scale is a measurement used to assess pain for children between the ages of 2 months and 7 years or individuals that are unable to communicate their pain. The scale is scored in a range of 0–10 with 0 representing no pain. The scale has five criteria, which are each assigned a score of 0, 1 or 2.

The FLACC scale has also been found to be accurate for use with adults in intensive-care units (ICU) who are unable to speak due to intubation. The FLACC scale offered the same evaluation of pain as did the Checklist of Nonverbal Pain Indicators (CNPI) scale which is used in ICUs.

**Table 3:** Scoring Criteria

Criteria	Score 0	Score 1	Score 2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, uninterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting, back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

**Scoring Procedure**

At the end of pain assessment, pain level was graded based on the following scores:

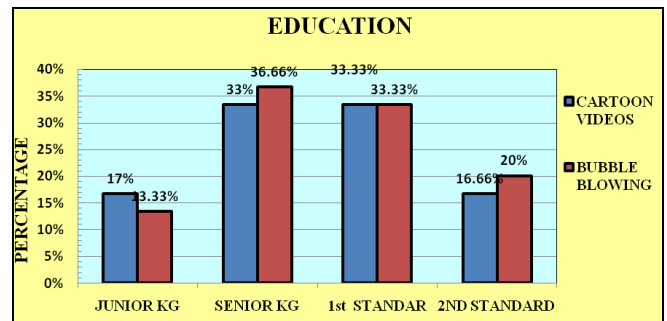
- 0 - Relaxed and comfortable
- 1-3 – mild discomfort
- 4-6 – moderate pain
- 7-10- sever pain

**Major findings of the study**

**Section-I**

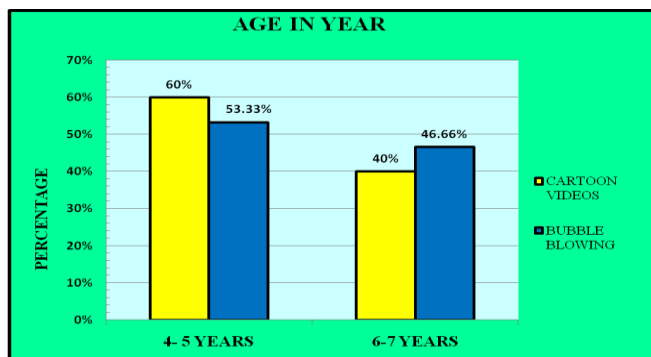
Frequency and percentage distribution of the children according to socio demographic variables. Demographic characteristics of the sample (Experimental group -1)

In accordance with 30 sample, it is observed that:



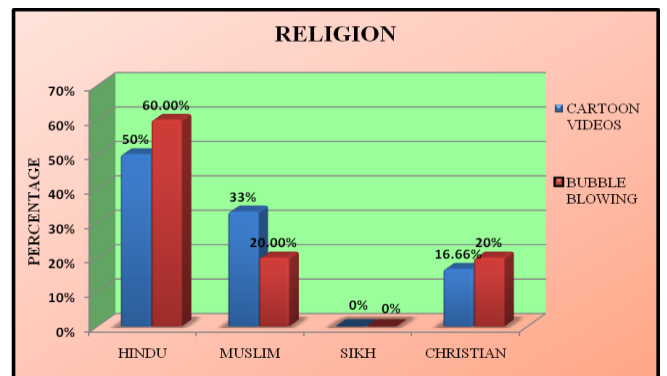
**Fig 3:** Distribution of subject according to their education

The table and figure reveals that 05 & 03 (16.66% & 13.33%) of the children are finished junior KG, about 10 & 11(33.33% & 36.66) of children finished senior KG and about 10, 10 (33.33% & 33.33%) were completed 1<sup>st</sup> standard and about 05, 06 (16.66% & 20%) of the child.



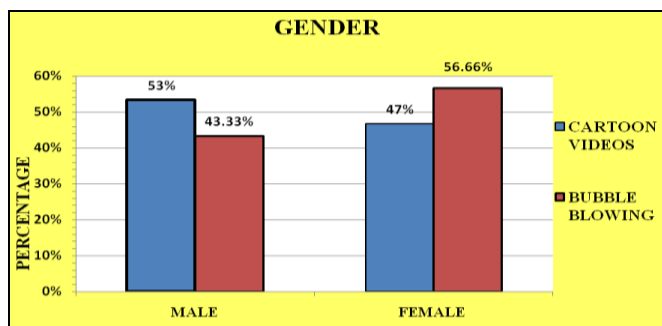
**Fig 1:** Distribution of subject according to their age

Show that the majority of the subject 18 & 16 (60% & 53.33%) were found with 5-6 year of age in cartoon video and bubble blowing. 12 & 14 (40% and 46.66%) of children were residing cartoon video & bubble blowing age group 6-7 year.



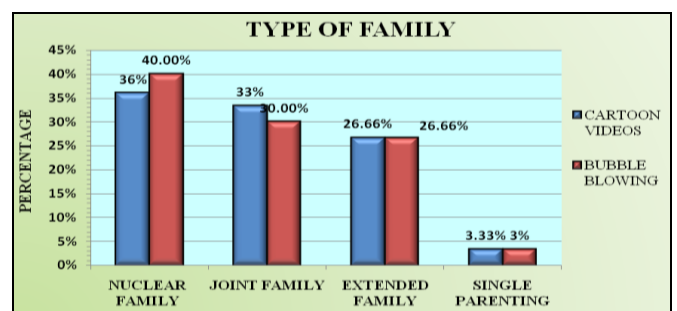
**Fig 4:** Distribution of subject according to their religion

show the both in cartoon video & bubble blowing 15 & 18 (50%& 60%) children are Hindu. Among the sample 10, 06 (33.33% & 20%) children are Muslim. among the sample 00% children related to Sikh and 05,06 (16.66% & 20%) children are related to Christian.



**Fig 2:** Distribution of subject according to their gender

Show that both in cartoon video and bubble blowing 16 & 13 (53.33% & 43.33%) in male children and about 14 & 17 (46.66% & 56.66%) in female children.



**Fig 5:** Distribution of subject according to their type of family

Shows 11 & 12 (36.66% 40%) of the children are form nuclear family, about 10,09 (33.33% & 30%) of the children are joint family, about 08,08 (26.66% & 26.66%) of the children are extended family and 01 & 01(03.33% &03.33%) children are form single parenting.

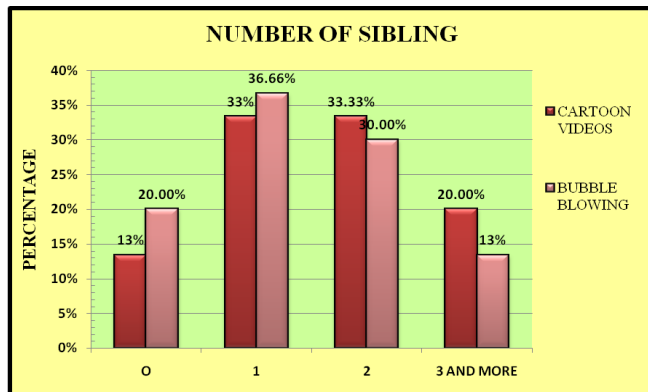


Fig 6: Distribution of subject according to their number of sibling

Show 04 & 06 (13.33% & 20%) of the children form 0, about 10& 11(33.33% & 36.66%) of the children form 1, 10&9 (33.33% & 30%) of the children form 2 and the 06 & 04 (20% & 13.33%) children are 3 and more.

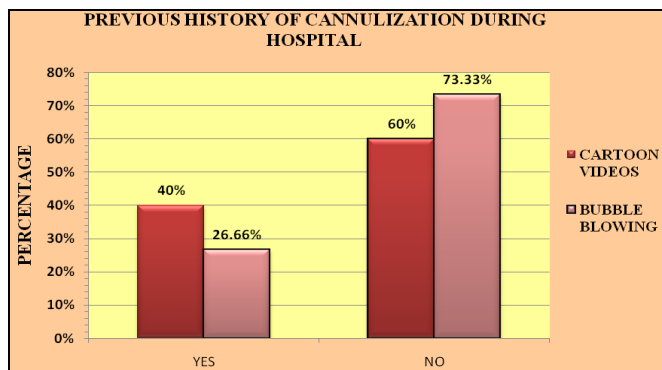


Fig 7: Distribution of subject according to their previous history of cannulization during hospitalization

Show the both in cartoon video & bubble blowing 12 & 08 (40%& 26%) children are yes. Among the sample 18, 22 (60% &73.33%) children are no.

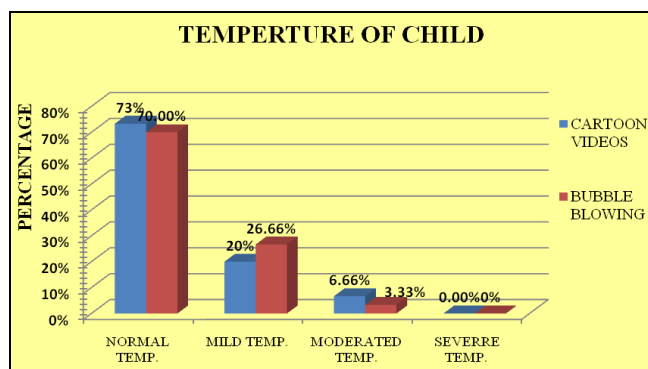


Fig 8: Distribution of subject according to their tamp. of child

Show the both in cartoon video & bubble blowing 22 & 21 (73.33%& 70%) children are normal temp. Among the

sample 06, 08 (20% &26.66%) children are mild temp. and 02,01 (2.66% & 3.33%) children are related to moderated temp. among the sample 00% children related to sever temp.

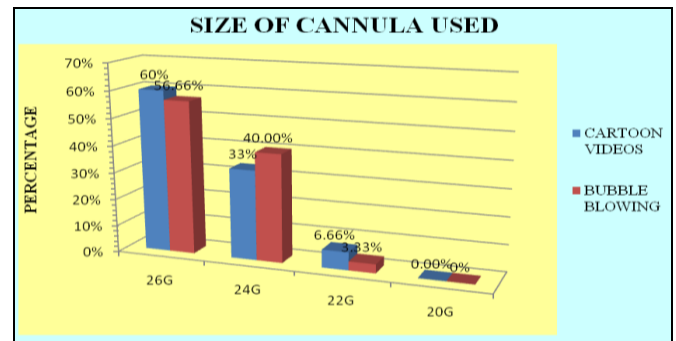


Fig 9: Distribution of subject according to their size of cannulization

Show the both in cartoon video & bubble blowing 18 & 17 (60% &56.66%) children are 26G. Among the sample 10, 12 (33.33% & 40%) children are 24G. 02,01 (2.66% & 3.33%) children are related to 22G. among the sample 00% children related to 20G.

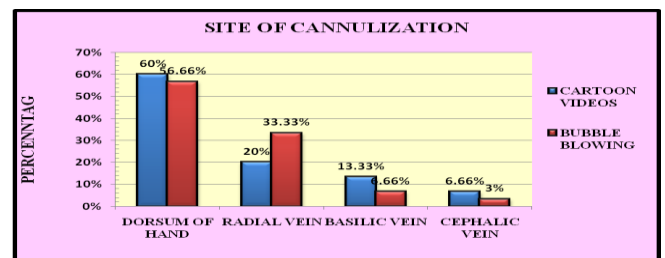


Fig 10: Distribution of subject according to their site of cannulization

Show the both in cartoon video & bubble blowing 18 & 17 (60% &56.66%) children are Dorsum of hand. Among the sample 06, 10(20% & 33.33%) children are radial vein. among the sample 04,02(13.33%&6.66%) children related to basilic vein sample and 02,01 (2.66% & 3.33%) children are related to cephalic vein

**Section-II**

The frequency and percentage distribution of the post test level of pain in the both experimental group.

My study deal with the non-pharmacological management of pain during cannulization through the both in cartoon video experimental group1 & bubble blowing experimental group 2 among children (4-7) reduction of pain perception during cannulization.

Distribution of subject show that in the experimental group1 majority 15 (50%) had moderated pain, 15 (50%) had severe pain and experimental group2 majority 27 (90%) had severe pain, 03 (10%0 had moderated pain.

**Section-III**

The comparison of post-test of pain between the experimental group1 and experimental group 2 was analyzed by 't' test. which is an inferential statistical analysis.

Distribution of subject Table & figure 3 show that in the



experimental group 1 the post level of mean pain score 6.5 and S.D 2.24, experimental group 2 the post level of mean pain score 7.2 and S.D 1.81 the mean difference score was  $\pm 0.7$  the calculated 't' value of 1.80 was statically signification at  $p < 0.05$  level indicating that there was significant difference in the post level of pain between the experimental group 1 and experimental group 2. Hence H1 is accepted.

#### Section-IV

The first objective was to assess the level of pain in children during cannulization in Experimental group 1 (cartoon videos) and Experimental group 2 (bubble blowing).

In the experiment group 1 (cartoon video) out of 30, 15 (50%) was moderated and 15 (50%) was severe pain in during cannulization. In experiment group 2 (bubble blowing) out of 30, 3 (10%) was moderated and 27, (90%) was severe during cannulization.

The second objective was to compare the effectiveness of cartoon videos and bubble blowing on pain perception during cannulization among children.

In the experimental group1, the post-test level of mean pain score was 6.5 with S.D 2.24 and in the experiment group 2 the post-test level of mean pain score was 7.2 with S.D 1.18 the calculated, 't' value of 1.80 was statically significant at  $p < 0.05$  level indicating that there was significant differences in the post-test level of pain between the experimental group1 and experimental group 2.

Hence the hypothesis H1 is accepted and stated that there is significant difference of pain level during cannulization between experiment group1 and experiment group 2.

**Hypothesis:** H0: There will be no significant different between the effect of cartoon video and bubble blowing on pain perception among children during cannulization. h1- there will be significant different between the effect of cartoon video and bubble blowing on pain perception among children during cannulization. h2:- cartoon video will be more effective than bubble blowing on pain perception during cannulization among children. Quantitative approach was used in this study, to assess the effectiveness of cartoon videos vs. bubble blowing during cannulization on pain perception among children admitted at selected Hospital Bilaspur Chhattisgarh. A research design is selected for the present study was comparative experimental post-test design. After taking institutional ethical clearance and informed consent of the participants. The sample size was 60 children (4-7yr), non-probability purposive sampling technique was used for this study. The tool used in this study was demographic variables proforma and FLACC scale for cannulization during pain perception. Test- retest method was used for testing reliability of tool. The checklist was found reliable. A pilot study was conducted on 06 children admitted in hospital. Data collection was analyzed by an paired 't' test. The main study conduct in CIMS, Bilaspur, Chhattisgarh (pediatric ward) and purposive sampling was done. The sample size was 60 i.e. 30 experimental group-1 and 30 for experimental group-2 were selected. RESULT:- Data collection was analyzed by an paired 't' test which reveals that the post-test mean cartoon videos during cannulization on pain perception experimental group-1 ( $X=6.5$ , S.D 2.24) were compare to

bubble blowing during cannulization on pain perception experimental group-2 ( $X=7.2$ , S.D 1.18) and obtained 't' = 1.80 which indicated that there was significant reduction of pain perception of experimental group-1 than experimental group-2.

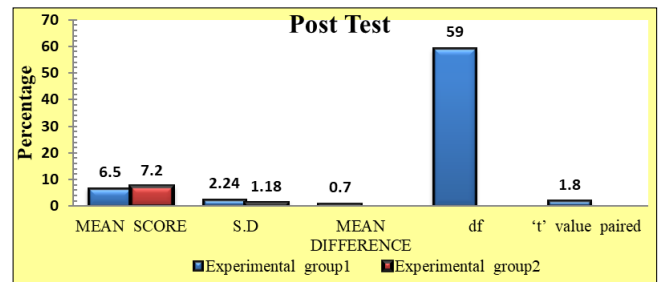


Fig 11: Experimental group 1 and group 2

The comparison between cartoon videos Vs bubble blowing during cannulization on pain perception among children through the coefficient of correlation. The calculated 'r' value of cartoon videos is 1 which is a very strong positive correlation  $r < 1$  while the calculate 'r' bubble blowing showing 0.72 which is a very strong positive correlation  $r < 1$ .

#### Findings of the study

With regard to the level of cannulization pain among preschoolers, most of them were found to have severe and moderate pain in the both experimental group, as measured by FLACC scale and both group exhibited only moderate and severe. It revealed that the pain during cannulization which denotes that the reduction of pain was due to showing cartoon video show.

Out of 30 samples that in the experimental group1 majority 15 (50%) had moderate pain, 15(50%) had severe pain and in experimental group majority 27(90%) had severe pain, 3(10%) had moderate pain.

It depicts that in the experimental group1, the post test level of mean pain score was 6.5 with S.D 2.5 and in the experimental group2 the post test mean score was 8.16 with S.D 34.168. The mean difference score was  $\pm 0.7$ . The calculated 't' value of 1.80\* was statistically significant at  $p < 0.05$  level indicating that there was significant. difference in the post test level of pain between the experimental1 group and experimental2 group.

With regard to the association of post test level of pain in the control group with demographic variable. There was no association between post test level of pain with selected demographic variable.

#### References

1. United Nations General Assembly. Convention on the Rights of the Child. Geneva: UN; 1989. Available from: [Google Scholar]
2. Anand KJS. Randomized trial of fentanyl anesthesia in preterm babies undergoing surgery: effects on stress response. Lancet. 1987;31:243-247. DOI: 10.1016/S0140-6736(87)90065-1. Available from: [PubMed]
3. Phogat R. The effectiveness of animated cartoon video as a distraction strategy on pain perception during

- venipuncture among children in selected hospitals of Gurugram, Haryana. *International Journal of Research in Paediatric Nursing*. 2020;2(2):18-22.
4. Abdelmoniem SA, Mahmoud SA, et al. Compare the efficacy of different distraction techniques (passive, active, and passive-active) on children's pain perception during local anesthesia administration at the Pediatric Dentistry and Dental Public Health Department, Egypt. *Pediatric Dentistry and Dental Public Health Department, Faculty of Oral & Dental Medicine, Cairo University*; c2016.
  5. Hockenberry JM, Wilson D. Wong's Essentials of Pediatric Nursing. 9<sup>th</sup> ed. St. Louis: Mosby Elsevier; c2009. p. 156.
  6. Tanimoto K. Reducing pain associated with immunization in three settings. Available from: <https://www.semanticscholar.org/paper/Reducing-Pain-Associated-with-Immunization-in-Three-Tanimoto/58b0526761539d50c593439dcb571783e74fe039>
  7. Gate control theory. Available from: <https://www.sciencedirect.com/topics/medicine-and-dentistry/gate-control-theory>

**Creative Commons (CC) License**

This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY 4.0) license. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.