

EFFECTIVENESS OF CARTOON PAINTING DURING CLINICAL PROCEDURES IN REDUCING ANXIETY AMONG PRESCHOOL CHILDREN

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Abstract

Background: Procedural anxiety is common among preschool children undergoing hospital-based clinical interventions. Developmental immaturity limits their coping mechanisms, making non-pharmacological interventions essential in pediatric practice. **Objective:** To evaluate the effectiveness of cartoon painting during clinical procedures in reducing anxiety among preschool children and to examine its association with selected demographic variables. **Methods:** A quantitative pre-experimental study using a non-equivalent one-group pre-test post-test design was conducted among 60 preschool children aged 3–7 years in a selected Children hospital, Cuttack, Odisha. Anxiety was assessed using the Modified Yale Preoperative Anxiety Scale (mYPAS). Cartoon painting was implemented during the procedure as a distraction intervention. Paired t-test and chi-square test were used for analysis. **Results:** The study findings revealed that the majority of preschool children had severe pre-test anxiety levels prior to the intervention. The mean pre-test anxiety score was 70.61 ± 10.11 , which significantly reduced to a post-test mean score of 38.03 ± 9.79 following cartoon painting during clinical procedures. The paired t-test showed a highly significant reduction in anxiety levels ($t = 18.47$, $df = 59$, $p < 0.05$), indicating the effectiveness of the intervention. **Conclusion:** Cartoon painting during clinical procedures reduced preschoolers' procedure-related anxiety in a non-pharmacological, child-friendly way. It should be included in pediatric care. Research using randomised controlled or multi-group designs with bigger and more diverse samples is recommended to compare cartoon painting with other distraction methods.

Keywords: cartoon painting, pre-schoolers, clinical procedures, non-pharmacological management

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1. Introduction

The emotional responses of children during clinical procedures at the time of hospitalization play a critical role in forming the doctor-patient relationship and ensuring the effectiveness of treatment by alleviating procedural anxiety. Children frequently encounter challenges in recognizing the emotions they experience in clinical environments. To address this, various pictorial assessments have been developed to aid in the identification of emotions through facial expressions. Children convey their emotions through facial expressions, body language, behaviour, and, notably in younger children, through play. Observing these external manifestations can offer valuable insights into a child's emotional state and needs. Experiencing a diverse range of emotions is essential for children's development and overall well-being.¹ Interpreting children's emotions is complex, as a single behaviour can often signify multiple emotions simultaneously. Emotional

development is a fundamental aspect of human growth, beginning at birth and continuing into adulthood. From infancy, babies express emotions through social smiles and crying, using these as tools to communicate their feelings²

Several methods help reduce anxiety, pain, and distress in children. These include cartoon painting, art therapy, tell-show-do, ask-tell-ask, voice control, nonverbal communication, positive reinforcement, and distraction. Parents and nurses now prefer gentler methods like tell-show-do and distraction. The American Academy of Pediatric Dentistry explains tell-show-do and distraction techniques.⁷ Building on the proven effectiveness of distraction techniques in medical settings for adults, their application in children's dental treatments has become increasingly common. These techniques have been previously found to be

beneficial during clinical procedures by reducing children's distress and perception of pain, particularly during the administration of local anesthesia.⁸

For preschool children, venipuncture is often seen as a bodily threat that can cause significant pain and anxiety, potentially leading to a traumatic experience. If the discomfort and anxiety a child feels during venipuncture are not effectively managed, it can result in trauma, and such traumatic experiences in childhood can have lasting effects. The idea of atraumatic treatment in emergency departments has not been extensively studied in previous research.⁹

1.2 NEED FOR THE STUDY

Clinical treatments frequently elicit intense anxiety and anguish in preschool-aged children, resulting in resistance, increased pain sensitivity, and inferior health outcomes. If you don't manage procedural anxiety, it can have long-term implications on your mental health, such making you more afraid and less able to handle pain in future medical situations. Effective distraction tactics lessen these reactions by shifting focus away from harmful stimuli, which improves cooperation and recovery.¹⁵

Cartoon painting is an energetic, multimodal activity that gets young kids involved in a creative way. It helps children control their emotions during non-invasive procedures like nebulization, vital sign monitoring, tube feeding. Current research endorses several distractions—interactive games, virtual reality, music—yet evidence is scarce for toddlers in resource limited environments such as hospitals in Odisha.¹⁶

Hospitalization and therapeutic or invasive procedures e.g., venipuncture, chemotherapy, surgery, dental treatment) consistently produce high anxiety levels in children, which in turn worsen pain, cooperation, recovery, and later behaviour. 41.7–75.4% of children have worry before surgery, which is linked to a worse recovery after surgery and more bad behaviours at home. Younger age, parental worry, and bad hospital stay in the past are all big risk factors. Not-surgery invasive treatments like venipuncture also make kids ages 6 to 12 feel "intense discomfort, anxiety, and pain." In paediatric emergency rooms, invasive treatments make kids much more anxious, in pain, and afraid of doctors if they are not distracted. In the same way, dental treatments cause a lot of pain and anxiety, which makes people less cooperative and less likely to behave properly. Most preschool and school-age kids who are hospitalised have moderate to serious anxiety about being there and the procedures that will happen.²³ There is an urgent need to measure medical procedure anxiety in hospitalised children using reliable scales, see how structured cartoon painting activities affect anxiety during these interventions, and gather evidence to back the use of low-cost, nurse-delivered cartoon painting as an evidence-

based, standardised method to alleviate paediatric hospital anxiety.

1.3 STATEMENT OF THE PROBLEM

A study to assess the effectiveness of cartoon painting during non-invasive clinical procedures in reducing anxiety among preschoolers in a selected hospital in Cuttack, Odisha.

1.4 OBJECTIVES OF THE STUDY

1. To assess the anxiety on non-invasive clinical procedures before and after the cartoon painting among preschoolers.
2. To assess the effectiveness of cartoon painting during non-invasive clinical procedures in reducing anxiety among preschoolers.
3. To find the association between the post-intervention level of anxiety and selected demographic variables.

1.5 HYPOTHESIS

All the hypothesis were tested at the p value < than 0.05

H₁ - There is a significant difference between the pretest and post test anxiety scores of preschoolers after the cartoon painting during non-invasive clinical procedures.

H₂ - Cartoon painting during non-invasive clinical procedures significantly reduce anxiety among preschoolers.

H₃ - There is a significant association between the post test anxiety scores of preschoolers with the selected demographic variables.

1.6 ASSUMPTIONS

1. Non-invasive clinical procedures may cause preschoolers to show obvious symptoms of anxiousness.
2. As a form of diversion, cartoon painting has the potential to impact preschoolers' mental well-being by reducing anxiety, promoting relaxation and enhancing emotional expressions.
3. Cartoon painting helps to develop preschoolers' positive emotional responses, creativity, imagination and reducing anxiety during stressful situations.
4. Anxiety may fairly compare before and after the intervention due to the consistency of the hospital environment and non-invasive clinical procedures.

1.7 OPERATIONAL DEFINITIONS

Effectiveness: In this study, effectiveness pertains to the degree to which the cartoon painting intervention successfully alleviates the anxiety levels of preschool children undergoing non-invasive clinical procedures. The measurement involves comparing the children's anxiety scores prior to and following the intervention.

Cartoon Painting: Cartoon painting is a systematic way to keep preschoolers busy during non-invasive medical procedures. They colour or paint predawn cartoon pictures using crayons for around 10 minutes. This activity is meant to keep the youngster from thinking about the surgery and help them relax, which will make them less anxious.

Anxiety: Anxiety is the emotional state that preschoolers may have before or during non-invasive clinical procedures, which is marked by emotions of fear, worry, or apprehension. This study evaluates anxiety through a suitable observational or rating scale specifically developed to quantify behavioural signs of distress in children.

Preschoolers: Children in the early stages of growth and development between the ages of 2 to 7 years are known as preschoolers, and they usually attend preschool or kindergarten. High levels of imagination, emotional sensitivity, and a restricted capacity to handle medical surroundings are characteristics of this age group.

Non-invasive Clinical Procedures: Non-invasive Clinical procedures are the planned and organised activities that health professionals do for diagnostic, therapeutic, or supporting reasons. In this study, the term explicitly encompasses prevalent non-invasive or minimally invasive techniques for preschoolers, including nebulisation, nasogastric feeding, and vital sign assessment.

1.8 DELIMITATIONS

- The research focused on preschool children aged 2 to 7 years receiving non-invasive clinical procedures at a designated facility in Cuttack, Odisha.
- Only cartoon painting served as the distraction technique; other nonpharmacological therapies, such as music therapy and play therapy, were excluded.
- Anxiety levels were assessed solely throughout the non-invasive clinical procedure, excluding measurements before hospital admission or after discharge.

- The sample size was constrained to the preschoolers present during the data collection period at the designated hospital.

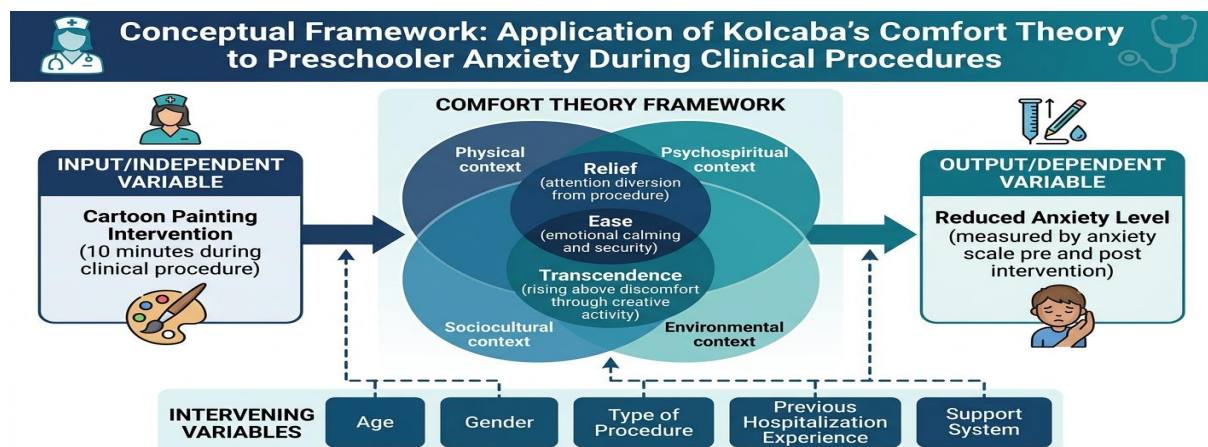
1.9 CONCEPTUAL FRAMEWORK

Katharine Kolcaba's Comfort Theory offers a comprehensive lens through which to assess the efficacy of cartoon painting as a diversion tool in reducing anxiety among preschoolers during non-invasive clinical procedures. The approach emphasises that comfort is a desirable outcome of nursing care, which occurs when patients' basic needs are addressed in physical, psychospiritual, sociocultural, and environmental settings. Comfort is further divided into three types: alleviation, ease, and transcendence, which collectively define the multifaceted feeling of well-being.

Conceptual link between variables

Based on Comfort Theory, your study examines how a nurse initiated comfort intervention (cartoon painting) reduces preschoolers' anxiety during non-invasive clinical procedures. The independent variable is the fixed duration cartoon painting activity during the process, while the dependent variable is anxiety before and after the intervention. Kolcaba believed that systematically identifying and addressing comfort needs improved comfort, which was reflected in behavioural and emotional outcomes.

According to Kolcaba, age, prior hospitalisation experiences, type of procedure, and support systems can affect how each child perceives and responds to the comfort intervention. Your study accepts these demographic and clinical factors as variables that may affect cartoon painting's anxiety-reduction effects.



2. REVIEW OF LITERATURE

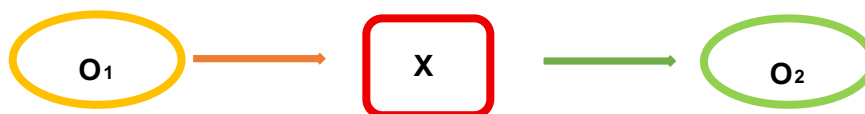
Preschool children frequently experience dread during hospitalisation, which can impede their recovery and treatment. Three infants who were hospitalised were the subjects of a case study that investigated the effects of audiovisual distraction during inhalation therapy. The study involved the viewing of a 15-minute cartoon. Measured by the Child Fear Scale, fear levels and physiological parameters decreased by 2–3

points prior to, during, and following the intervention. The results of the study confirm that the consumption of cartoons has a significant impact on the reduction of physiological stress and anxiety, thereby substantiating its use as a straightforward, non-pharmacological nursing strategy in paediatric care.¹⁷

The cooperation and care of preschool children are frequently disrupted by needle-related

procedures, such as venipuncture, which can cause distress. To help children understand venipuncture through cartoon storytelling, a medical picture book called Sick Rui-Rui Bear was created. The effectiveness of it was evaluated in a quasi-experimental study using the Observational Scale of Behavioural Distress—Revised. When comparing the picture book group to the controls, the results demonstrated considerably decreased distress scores ($p < .001$). Reducing procedural distress in preschoolers through the routine use of picture books is supported by the findings. This intervention is straightforward and enjoyable.¹⁸

Preschoolers frequently experience pain and fear after venipuncture, which decreases cooperation with care. Cartoon watching was tested as a distraction technique in a randomised controlled trial with 140 participants. Validated measures such as SCAS, FLACC, and FIS were used to measure pain and anxiety. The intervention group's post-venipuncture pain and anxiety scores were considerably lower than those of the control group ($p < 0.05$). Results support the use of cartoon distraction in paediatric nursing practice by demonstrating its efficacy as a non-pharmacological method of reducing discomfort during venipuncture.¹⁹



Key:

O₁- Pre-Test assessment of Anxiety

X – Intervention (Cartoon Painting)

O₂- Post-Test assessment of Anxiety

3.3 SETTING OF THE STUDY

The study is carried out in the paediatric outpatient and emergency units of Sishu Bhaban Hospital in Cuttack, Odisha. These units were chosen as they are settings where preschool children routinely undergo clinical procedures and where anxiety related to such procedures is commonly observed.

3.4 STUDY VARIABLES

3.4.1 Independent variable: Cartoon painting intervention administered during non-invasive clinical procedures among preschool children.

3.4.2 Dependent variable: Anxiety about non-invasive clinical procedure among preschool children.

3.4.3 Demographic variables: Age, gender, father's education, mother's education, father's occupation, mother's occupation, monthly income, type of family, type of clinical procedure, duration of hospital stay, presence of parents during non-invasive clinical procedure.

3.5 POPULATION OF THE STUDY

3.5.1 Target population: All preschool children aged 2–7 years admitted to hospital and undergoing clinical procedures.

3. RESEARCH METHODOLOGY

Research methodology denotes the overall plan and systematic procedure adopted for obtaining valid and reliable data relevant to the research problem. In this study, the methodology comprised the selection of an appropriate research approach and design, specification of the setting and population, sampling strategy, development and validation of tools, implementation of the intervention, procedures for data collection, and the plan for data analysis.

3.1 RESEARCH APPROACH

A quantitative research approach used, as the study involved the objective measurement and statistical analysis of numerical data related to anxiety levels among preschool children.

3.2 RESEARCH DESIGN

A pre-experimental research design is adopted for the study. A single group of preschool children was observed at two time points: before the intervention (pretest) and after the intervention (post-test). This design facilitated the assessment of changes in anxiety attributable to the cartoon painting intervention over time, despite the absence of randomization and a separate control group.

3.5.2 Accessible population: Preschool children aged 2–7 years admitted in the selected hospital at Cuttack, Odisha, who were available and met the eligibility criteria during the period of data collection.

3.6 SAMPLE AND SAMPLING TECHNIQUE

3.6.1 Sample:

The sample consisted of preschool children aged 2–7 years who were hospitalized and underwent clinical procedures during the data collection period.

A total of 60 children were included in the study.

3.6.2 Sampling Technique:

Non-probability purposive sampling is a method of sampling in which the researcher intentionally selects participants based on their specific characteristics. The main goal is to ensure that the selected participants can provide the most appropriate and useful information for the study.

3.7 CRITERIA FOR SAMPLE SELECTION

3.7.1 Inclusion criteria

- Children who are hospitalized and undergoing clinical procedures.
- Children who are under going non-invasive clinical procedure like nebulization, vital sign monitoring, tube feeding.
- Children medically stable and able to participate in the intervention.
- Children who has the ability to engage in drawing and painting cartoon pictures appropriate for their age.

3.7.2 Exclusion criteria

- Children with sensory impairment like visual and auditory issues are not included.
- Children who are documented to have developmental delay. ☐ Children those who are critically ill and not able to hold colour pencil ☐ Parents who are not willing to give consent.

3.8 RESEARCH TOOL AND INTERVENTION

Part A: Background data

Part A consisted of a structured demographic and clinical data sheet. It included items on age, gender, previous hospitalization, father's education, mother's education, father's occupation, mother's occupation, family income, type of family, presence of caregiver with the child, duration of hospitalization, and type of procedure.

Part B: Modified Yale Preoperative Anxiety Scale (mYPAS)

Anxiety levels were assessed before and after the cartoon painting intervention using the Modified Yale Preoperative Anxiety Scale (mYPAS), which is an observational tool commonly used to measure preoperative anxiety in children aged from 2-12 year. The scale comprises five domains: activity, emotional expressivity, state of arousal, vocalization, and use of parents are scored from 1 to 4, while vocalization is scored from 1 to 6. The observer carefully watches the child's behaviour and selects the most appropriate score in each category. To calculate the mYPAS score, the raw score of each domain is first converted into a standardized value by dividing it by the maximum possible score of that domain. The final score typically ranges from approximately 23.33 to 100, where higher scores indicate higher levels of anxiety. It is important to note that no subtraction is involved in this calculation; only division, addition, and multiplication are used.

Interpretation:

Higher score indicates greater dependence, which reflects higher anxiety.

Scoring Method

Each domain has a different number of categories, so scores are standardized using a formula.

- ☐ Step 1: Convert Each Domain Score
- ☐ Step 2: Add All Adjusted Scores
- ☐ Step 3: Final mYPAS Score

Score Range Each domain has a different

number of response categories, some domains have 4 categories, while others have 6 categories, depending on the range and depth of behaviours observed. Activity, Emotional Expressivity, and Use of Parents are each scored on a 4-point scale. This means that the child's behaviour in these domains is classified into one of four levels ranging from relaxed to highly anxious. In the Activity domain, a score of 1 indicates the child is calm and still, while a score of 4 indicates excessive movement or restlessness. Similarly, Emotional Expressivity ranges from happy and relaxed (score 1) to fearful and distressed (score 4). The Use of Parents domain assesses dependency, where a higher score indicates increased need for parental presence and reassurance.

Vocalization and State of Apparent Arousal are scored on a 6-point scale, as these behaviours have more variability and require finer observation. In the Vocalization domain, scoring ranges from no crying or normal speech (score 1) to intense crying or screaming (score 6). The State of Apparent Arousal domain assesses the child's level of alertness and anxiety, where a score of 1 represents a calm and relaxed state, and a score of 6 represents extreme agitation or panic. Because different domains have different maximum scores (4 or 6), direct addition of raw scores is not appropriate. Therefore, each domain score is standardized by dividing the observed score by the maximum possible score of that domain (i.e., 4 or 6). This ensures that all domains contribute equally to the final anxiety score. After standardization, the scores are summed and converted into a percentage to obtain the final mYPAS score.²⁰

- Minimum score = 23.33 & Maximum score = 100

Score Interpretation

Score Range and Interpretation

23.33 – 30 - No anxiety / Minimal

31 – 50 - Mild anxiety

51 – 70 – Moderate anxiety

71 – 100 - Severe anxiety

Assessing interventions like cartoon painting, mYPAS is applied before and after the intervention to evaluate its effectiveness in reducing anxiety levels among preschool children.

3.9 DATA COLLECTION PROCEDURE

Data collection was initiated after obtaining ethical clearance from the Institutional Ethics Committee and written informed consent from parents or legal guardians of eligible children. Preschool children aged 2–7 years scheduled for clinical procedures in the selected units were identified using purposive sampling. Before the initiation of the cartoon painting activity, each child's anxiety level assessed using the Modified Yale Preoperative Anxiety Scale (mYPAS) during the clinical procedure. The intervention implemented by engaging the child in cartoon painting throughout the procedure.

Immediately following the procedure, the anxiety level reassessed using the same scale.

4. RESULTS AND ANALYSIS

Table - 1: Frequency and Percentage Distribution of Samples According to Socio-Demographic Variables
n = 60

S. No	Socio-Demographic Variables		Frequency	Percentage
1.	Age (Years)	2 - 4 Years	35	58.3
		5 - 7 Years	25	41.7
2.	Gender	Male	30	50.0
		Female	30	50.0
3.	Fathers Education	Primary	10	16.7
		Higher	24	40.0
		Higher Secondary	26	43.3
4.	Mothers Education	Primary	10	16.7
		Higher	10	16.7
		Higher Secondary	40	66.7

Interpretation: Table-1 shows the socio-demographic distribution of 60 preschool children. Most parents were well educated, with 66.7% of mothers having higher secondary.

Table – 2: Effectiveness of Cartoon Painting on Reduction of Preprocedural Anxiety Among Pre-School Children

n = 60						
Pre- Procedural Anxiety	Mean	SD	Mean Difference	Paired 't' test	p value	Result
Pre – Test	74.75	6.02	30.22	24.90 (df=59)	0.001	Significant
Post – Test	44.53	11.87				

Significant at p value < than 0.05

Table-2 shows a significant reduction in anxiety after the cartoon painting intervention. The pre-test mean score was 74.75 (SD = 6.02), which decreased to 44.53 (SD = 11.87) in the post-test, with a mean difference of 30.22.

Level of procedural anxiety before and after the cartoon painting intervention

Table-3: Distribution of Samples According to Level of Procedural Anxiety Among Pre-School Children

n = 60					
S, No	Levels of Procedural Anxiety	Pre-Test		Post-Test	
		f	%	f	%
1.	Minimal Anxiety	0	0.0	43	71.7
2.	Mild Anxiety	0	0.0	17	28.3
3.	Moderate Anxiety	22	36.7	0	0.0
4.	Severe Anxiety	38	63.3	0	0.0

Table-2. Illustrates the distribution of procedural anxiety levels by frequency and percentage. Pre-test showed 38 (63.3%) children had severe anxiety, while post-test showed 43 (71.7%) had minimal anxiety.

Table – 4: Effectiveness of Cartoon Painting on Reduction of Procedural Anxiety Among Pre-School Children

n = 60						
Procedural Anxiety	Mean	SD	Mean Difference	Paired 't' test	p value	Result
Pre – Test	74.75	6.02	30.22	24.90 (df=59)	0.001	Significant
Post – Test	44.53	11.87				

Significant at p value < than 0.05

Table-4 shows a significant reduction in anxiety after the cartoon painting intervention. The pre-test mean score was 74.75 (SD = 6.02), which decreased to 44.53 (SD = 11.87) in the post-test, with a mean difference of 30.22. The paired t-test revealed a highly significant result ($t = 24.90$, $df = 59$, $p = 0.001 < 0.05$).

The current study found a number of socio-demographic factors that had a big effect on how well the cartoon painting intervention worked. It was statistically significant that women's anxiety levels dropped more than men's ($\chi^2 = 9.93$, $p = 0.02$), as more girls than boys moved from mild to minimal anxiety symptoms. Parental education was found to be a very important moderator. Both the father's ($\chi^2 = 29.30$, $p = 0.001$) and mother's ($\chi^2 = 34.39$, $p = 0.001$) education had strong links with the children's anxiety levels after the intervention. This meant that children whose parents had more education had more significant anxiety reductions. Family structure ($\chi^2 = 24.39$, $p = 0.001$) and monthly family income ($\chi^2 = 5.77$, $p = 0.05$) were also significantly linked to anxiety after the intervention. Children from higher-income families and joint family systems showed better anxiety reduction than their peers. The type of clinical procedure was significantly linked to the success of the intervention ($\chi^2 = 29.61$, $p = 0.001$).

5. DISCUSSION

This study demonstrated that cartoon painting is a simple, cost-effective, and nurse-led intervention that significantly reduced procedural anxiety among preschoolers. Pre-test findings revealed that most children experienced moderate to severe anxiety, while post-test results showed a remarkable shift, with 71.7% reporting minimal anxiety and none remaining in the severe category. The paired t-test confirmed a highly significant reduction in mean anxiety scores, highlighting the intervention's effectiveness. Domain-specific analysis using the Modified Yale Preoperative Anxiety Scale further revealed notable improvements, particularly in vocalization and emotional expressivity, indicating reduced crying, agitation, and distress. Clinically, the intervention offers a practical alternative to pharmacological methods, especially in resource-limited settings. By improving cooperation and reducing distress, cartoon painting enhances procedural efficiency and child well-being, making it a valuable addition to pediatric nursing practice.

6. SUMMARY OF THE STUDY

The study was conducted in a tertiary care pediatric setting in Cuttack, Odisha, focusing on preschool children undergoing clinical procedures. The target population comprised all preschool children aged 2–7 years undergoing clinical procedures, while the accessible population included those meeting inclusion criteria and available during the data collection period. A total of 60 children were selected using purposive sampling. Background

information was collected via a structured demographic proforma, and anxiety was assessed using the observational mYPAS before and immediately after the intervention.

The socio-demographic profile indicated that 58.3% of children were aged 2–4 years and 41.7% were 5–7 years; males and females were equally represented (50% each). Most mothers (66.7%) and a significant proportion of fathers (43.3%) had higher secondary or above education, and 70% of children lived in joint families. Families were fairly distributed across income categories, with 28.3% in lower, 35% in middle, and 36.7% in higher income groups, reflecting a heterogeneous socio-economic background. Prior to the intervention, 36.7% of preschoolers exhibited moderate anxiety and 63.3% exhibited severe anxiety, with none in the minimal or mild categories. Following the cartoon painting, 71.7% of children demonstrated minimal anxiety and 28.3% exhibited mild anxiety, with no cases of moderate or severe anxiety remaining.

Domain-wise analysis using mYPAS showed marked reductions in mean scores for activity, emotional expressivity, arousal, vocalization, and use of parents, indicating broad-based improvement in behavioural indicators of anxiety. The mean pre-test anxiety score was 74.75 (SD 6.02), which decreased to 44.53 (SD 11.87) in the post-test, with a mean difference of 30.22. The paired t-test yielded $t = 24.90$ ($df = 59$, $p = 0.001$), indicating a statistically significant reduction in procedural anxiety following the cartoon painting intervention. Chi-square analysis showed no significant association between pre-intervention anxiety and any socio-demographic variable. However, post-intervention anxiety level showed significant associations with gender, parental education, monthly income, type of family, and type of clinical procedure, partially supporting the hypothesis regarding demographic influences. Cartoon painting proved to be a **powerful, nurse-led, non-pharmacological intervention** that significantly reduced procedural anxiety among preschoolers. Its effectiveness was consistent across socio-demographic groups, with post-test outcomes influenced by gender, parental education, income, family type, and type of procedure. This validates cartoon painting as a practical, culturally adaptable strategy for pediatric anxiety management.

Clinical Implications For Practice

- Standardized cartoon painting kits in pediatric units
- Training nurses in non-pharmacological anxiety management
- Routine anxiety assessment before procedures

For Administration

- Policy inclusion under atraumatic care
- Budget allocation for child-friendly resources

For Education

- Pediatric simulation modules including distraction techniques

Conclusion

The present study shows that structured cartoon painting during clinical procedures significantly reduces anxiety among preschool children in a tertiary care hospital in Cuttack, Odisha. Before intervention, children showed moderate (36.7%) or severe (63.3%) anxiety; after intervention, 71.7% shifted to minimal anxiety and 28.3% to mild anxiety. The mean anxiety score reduced from 74.75 ± 6.02 to 44.53 ± 11.87 , with a significant mean difference of 30.22 ($t = 24.90$, $p = 0.001$). Analysis revealed reductions across all mYPAS components—activity, emotional expressivity, arousal, vocalization, and use of parents. Pre-intervention anxiety levels were not influenced by socio-demographic factors, while post-intervention anxiety showed associations with gender, parental education, monthly income, family type, and procedure type. It highlights nurses' role in assessing anxiety, delivering appropriate interventions, and creating child-friendly environments that prioritize emotional and physical well-being.

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