EFFECTIVENESS OF PRE -OPERATIVE VIRTUAL OT TOUR UPON ANXIETY OF CHILDREN UNDERGOING SURGERY

By

JEENA JOY

A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

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Approved by the Dissertation committee on**:** _____

Research Guide **:** _____

Dr. Latha Venkatesan,
M.Sc (N)., M.Phil(N)., Ph.D(N).,
Principal cum Professor,
Apollo College of Nursing,
Chennai- 600 095

Clinical Guide **:** _____

Prof.Nesa Sathya Satchi,M.Sc (N).,
Head of Department,
Child Health Nursing,
Apollo College of Nursing,
Chennai-600 095.

Medical Guide **:** _____

Dr.(Major) R.V.Bharath
Assistant Medical Superintendent,
Apollo Children's Hospital,
Chennai - 600 006.

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DECLARATION

I hereby declare that the present dissertation entitled "**Effectiveness of pre-operative virtual OT tour upon anxiety of children undergoing surgery**" is the outcome of the original research work undertaken and carried out by me under the guidance of **Dr. Latha Venkatesan M.Sc(N)., M.Phil(N)., Ph.D(N).,** Principal, Apollo College of Nursing, and **Prof.Nesa Sathya Satchi, M.Sc (N).,** HOD, Department of Child Health Nursing, Apollo College of Nursing, Chennai.I also declare that the material of this has not formed in anyway, the basis for the award of my degree or diploma in this University or any other Universities.

M.Sc. (N) II Year

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SYNOPSIS

An Experimental Study to Assess the Effectiveness of Pre-Operative Virtual Operation Theatre(OT) Tour Upon Anxiety in Children Undergoing Surgery at Selected Hospital, Chennai.

The Objectives of the Study

1. To assess the level of anxiety before and after pre-operative virtual OT tour in control and experimental group of children undergoing surgery.
2. To determine the effectiveness of pre-operative virtual OT tour upon level of anxiety by comparing the level of anxiety before and after pre-operative virtual OT tour in control and experimental group of children undergoing surgery.
3. To determine the level of satisfaction regarding pre-operative virtual OT tour in the experimental group of children undergoing surgery.
4. To find out the association between the selected demographic variables and the level of anxiety before and after pre-operative virtual OT tour in experimental and control group of children undergoing surgery.
5. To find out the association between the selected clinical variables and the level of anxiety before and after pre-operative virtual OT tour in control and experimental group of children undergoing surgery.

The conceptual framework of the study was based on “Wiedenbach’s Helping Art of Clinical Nursing theory” given by Wiedenbach which was modified for the present study. The study variables were the anxiety level of children undergoing surgery and pre operative virtual OT tour. An extensive review of

literature and guidance by experts formed the foundation to the development of Demographic variables proforma, Clinical variables proforma, Facial Image Scale for anxiety and Rating Scale on the level of satisfaction about pre operative virtual OT tour.

A Time series experimental design was used in this study. The present study was conducted in Apollo Children's Hospital, Chennai . A sample size of 60 children who met the inclusion criteria were chosen for this study of which 30 were taken for the control group and 30 for the experimental group through systematic random sampling.

The data collection tools were validated and the reliability was established through test-retest and split half technique. The researcher used validated tool for collecting data. After the pilot study, the data for the main study was collected by using the interview method. The data was collected by using Demographic variables proforma, Clinical variables proforma, Facial Image Scale for anxiety and Rating Scale on the level of satisfaction about pre operative virtual OT tour.

A Facial Image Scale for anxiety was administered to the participants and their anxiety level was found in both control and experimental group before the pre operative virtual OT tour. The pre operative virtual OT tour was then given individually to the experimental group of children undergoing surgery. Pre-operative virtual OT tour comprised of a video of about 7 minutes' duration which included the sequence of events a child has to undergo from the time of admission till discharge after surgery. Adequate explanations were provided regarding each procedure and the doubts of the children and their parents were clarified. Then the anxiety level of the child undergoing surgery was assessed in the Operation Theatre by the staff nurses in the OT and during the immediate post-operative period by the

investigator for both the control and the experimental groups of children undergoing surgery using Facial Image Scale. Level of satisfaction regarding pre operative virtual OT tour was also assessed in the experimental group of children undergoing surgery.

Major Findings of the Study

- Majority of the children in the control and experimental groups were doing their primary education (66%, 70%), belonged to nuclear family (77%, 63%), lived in urban area (73%, 66%) with a family income >Rs.20,001(90%,77%),used to share their fears with their mothers (80%, 70%) respectively.

- In control group most of the fathers were graduates (57%) and mothers had undergone secondary education (50%) whereas in experimental group most of the parents were graduates (63%).

- Significant percentage of children in the control and the experimental groups were between the age group of 11-12yrs (40%,40%),were males(53%,50%) and belonged to the Hindu religion (47%,50%), had genito urinary problems (33%, 37%) with illness lasting few months (37%,40%) respectively.

- All children in the control and the experimental groups had a previous history of hospitalization, had received information about surgery from their doctors (100%, 100%) and none of them had seen a video of a surgery before (100%, 100%) respectively.

- Majority of children in the control group experienced severe anxiety (90%, 90%) in pretest and post test.

- Majority of children in experimental group experienced severe anxiety (90%) before pre-operative virtual OT tour whereas after the pre-operative virtual OT tour, severe anxiety was found to be reduced to mild anxiety (60%) and moderate anxiety (40%).

- The difference in mean and standard deviation of the anxiety levels of children before pre-operative virtual OT tour (M=4.1, 4.1 & SD=0.3, 0.3) between the control and experimental groups was not statistically significant ($p<0.001$), whereas after pre-operative virtual OT tour, there is a difference in the mean and standard deviation of anxiety levels (M=4.1, 0.3 & SD=2.4, 0.49) between the control and experimental groups of children undergoing surgery. So the null hypothesis Ho_1 was rejected with regard to experimental group alone.

- Majority of the children were highly satisfied (87%) with pre-operative virtual Operation Theatre tour and none of them were dissatisfied with the intervention. This shows that pre-operative virtual Operation Theatre tour was highly effective in reducing the anxiety of children undergoing surgery.

- There was significant association between the selected demographic variable gender and anxiety level in the control group ($\chi^2=3.8$,df=1) at $p<0.05$, but there was no significant association between other demographic variables and anxiety levels in the control and experimental groups. Hence the null hypothesis Ho_2 was rejected with regard to gender.

- No significant association was found between the clinical variables and the level of anxiety in both the control and experimental group of

children undergoing surgery. So the null hypothesis H_{03} emphasizes that clinical variables have no influence over the anxiety of children undergoing surgery and necessitates the provision of an external agent in reducing the anxiety of children undergoing surgery.

This study demonstrated that pre-operative virtual OT tour can help in reducing the anxiety of children undergoing surgery.

Recommendations

- The same study could be conducted on larger samples for better generalization.
- The study could be replicated by allocating more time for data collection.
- The study could be conducted for all invasive procedures in children.
- A similar study can be conducted comparing two or more groups like government, semi government and private hospitals.

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CHAPTER I

INTRODUCTION

Background of the Study

"Anxiety does not empty tomorrow of its sorrows, but only empties today of its strength."

-Charles Spurgeon

Children are the future of every nation across the world. It is today's generation which can go ahead and make the world a better place. If today's children are healthy, it can lead to a much healthier future. The paediatric population in hospitals today has changed dramatically over the last two decades. Although there is a growing trend toward shortened hospital stays and outpatient surgery, a greater percentage of the children hospitalized today have more serious and complex problems than those in the past.

The term 'anxiety' conjures up images of someone pacing the floor and wringing his hands with pounding heart and rapid breathing. Personal description includes a feeling of uneasiness, weakness, a queasy feeling in the stomach and light headedness. Popular use of the term also refers to anticipation of the dreaded with the term anxiety. Anxiety is derived from the Greek word meaning 'to press tight'. "Aurous" pertains to anger in Latin. "Anxiety is an unpleasant emotional state or condition which is characterised by subjective feelings of tension, apprehension and worry and by activation or arousal of the autonomic nervous system" (Spielberger, 1972).

Hospital admission for children inevitably provokes feelings of anxiety for both parent and child. Often illness and hospitalization are the first crises children must face. Especially during the early years, children are particularly vulnerable to the crises of illness and hospitalization because stress represents a change from the usual state of health and environmental routine and children have a limited number of coping mechanisms to resolve stressors. It is estimated that around 50-70% of hospitalized children experience severe anxiety and behavioural changes.

Surgery imposes at least five threats to children of all ages including physical harm or bodily injury, separation from parents and the absence of trusted adults, the strange and unknown, uncertainty about limits and expected acceptable behaviour and loss of control, autonomy and competence. Feelings of anxiety and frustration are often related to lack of information about procedures and treatments, unfamiliarity with hospital environment, rules and regulations, unfriendly staff or fear of asking questions. Much anxiety can be alleviated in a paediatric unit when parents are aware of what to expect and what is expected of them. Parents should be encouraged to participate in their child's care.

Interpersonal theorists (1996) believe that anxiety arises from experiences in relationship with significant others throughout a person's development. If the child is treated malevolently or is mystified by or not encouraged in his own uniqueness, the foundation is laid for the child to become basically insecure and anxious in future interpersonal situations. As the child matures, these strategies become an aspect of the personality style of the adult.

Existentialist writers (1996) stated that anxiety is a fact of life. It is continuous, underlying current situations throughout the life. Anxiety become all the

more evident in situations such as confrontation with one's values, freedom and authority, other persons, one's need to be authentic and impending death. Anxiety is common in childhood, but its nature changes as the child grows.

The Nursing Diagnosis Association (1994) identified anxiety as a major area where the nurses can play an important role in nursing in relieving the anxiety of patients and relatives by implementing various nursing interventions. It has also given importance in helping families to cope with the situation. Proper evaluation of the disease process, explanation of routines and procedures will help to allay many of the fears.

The person evaluating the clinical significance of anxiety symptoms in children must consider the age of the child. Anxiety can be manifested either directly or indirectly. The relationship to life events is explored and the child is taught specific behavioural and cognitive techniques needed to confront the anxiety.

The reason why psychological preparation of children is absolutely essential is the need to overcome serious consequences in the post-hospitalization period. That is, children's anxiety before an operation has a negative effect on their recovery. Those children who suffer most from pre-surgical anxiety also have more problems when they leave hospital: emotional and behavioural disturbances (aggression, depression, enuresis, encopresis, regressive behaviour, etc.), eating and sleeping disorders, and other problems of a somatic nature (pain, infections, slow healing, etc.) (Lumley, Melamed and Abeles, 1993).

Thus psychological preparation is important for these two reasons- to avoid anxiety in children during hospitalization and to prevent possible disorders after

hospitalization. However, there is a third reason that is equally important, future medical experiences. Children's experience of hospitalization will mark their future reactions to medical situations (Breitkopf et al, 1986, Lumley .M, 1993). A negative experience may mean that the child will always be afraid of doctors and nurses. Therefore psychological preparation will help children to face present hospital experiences in the best possible way and it will also help them in any similar future situations.

Need for the Study

The current population of India is 1,21,01,93,422 of which paediatric population comprises 31.4 %, that is, it comprises a major part of the population. Children may react to the stressors of hospitalization in different ways. Without special attention devoted to meeting the child's psychosocial and developmental needs in the hospital environment, the detrimental consequences of prolonged hospitalization may be severe.

Honton (2010) revealed that the pre-adolescent experiences severe anxiety and also problems including feelings of isolation, repression, boredom, hopelessness, exhaustion, lack of privacy, financial burden , role strain and family disruption. The prospect of a child having surgery generates anxiety regardless of the specific nature of the surgery. The source of children's anxiety may stem from their worry about something going wrong, the administration of the anesthetic, the possibility of dying during surgery and uncertainty about the course of post operative recovery, parental separation, pain or discomfort and loss of control. The lower the pre operative anxiety, the lower will be the post-operative anxiety.

Brooking et al (2009) explains the principles of desensitization to be understood by all nurses. Experiences which are accompanied by anxiety are likely to be associated with the same or greater levels of anxiety in the future. Preventing feelings of anxiety through nurses anticipating and providing coping resources may reduce association of fear in the future. Establishing a supportive relationship with anxious patients is fundamental to the role of the nurse. No other professional has such an explicit responsibility for the psychological welfare of patients or such opportunities and potential skills.

Johnson (2009) informed that the sensations, sensory information of touch, sight sound and smell are also found to be particularly helpful for major tests or surgical procedures. For children particularly between 1 – 12 years of age, separating them from their parents can be emotionally and psychologically wrenching. Being torn away from them for surgery or other medical procedures can be particularly traumatic. Recognizing this, health care providers have acknowledged that letting parents also in preparing the child for the surgery can be an asset. Parental involvement helps alleviate not only the child's anxiety, but the parents' also. By participating in their child's care they feel empowered that they have some control over child's well-being.

Mac and Clark (2008) stated that by providing a sympathetic and understanding presence, a nurse can do a great deal to help those who may be feeling lonely and anxious. Asking patients open questions about their feelings are clearly necessary to establish sensible strategies for care. Feelings supported or cared for is said to be a fundamental buffer to stress and anxiety.

In 2007, Lewandowski suggested that many fears and anxieties of the child can be alleviated by adequate preparation prior to surgery. This can be done by

someone whom the child trusts. The person should have opportunities to talk about his/her concepts of the surgery and of what is going to be done and why. The explanation of his particular surgery should be repeated many times before the surgery and the child's questions should be answered.

Timmerman (2007) conducted a study to analyze common fears of children undergoing surgery and identified that 94 % expressed fear of the unknown as the most common problem. Letting them know what to expect can ease the fear and help children as well as their parents to cope better. Children who are prepared for surgery recover faster and have fewer negative effects.

The rationale for preparing children for surgery is based on the principle that fear of the unknown (fantasy) exceeds the fear of the known. Therefore decreasing the elements of the unknown results in less fear. When children do not have paralyzing fear to cope with, they are able to direct their energies toward dealing with other, unavoidable stressors of hospitalization and to benefit optimally from the growth potential of the experience.

In India, unfortunately only a few nursing studies have been conducted in the field of anxiety of children undergoing surgery. The researcher through extensive review of literature found that only a few studies have been done to assess the pre operative anxiety among children and the effectiveness of interventions such as pre operative virtual operation theatre tour in reducing it. In the light of all the literature referred to, it was understood that children need to be oriented to the operation theatre and operation theatre staff, as well as proper explanations to reduce their anxiety. This would help to gain their co operation during the induction of anaesthesia and surgery and facilitate reduction of post-operative complications and aid faster recovery. Hence the researcher felt the need for conducting a study to

assess the effectiveness of pre-operative virtual OT tour upon anxiety among children undergoing surgery.

Statement of the Problem

An Experimental Study to Assess the Effectiveness of Pre-Operative Virtual Operation Theatre (OT) Tour upon Anxiety among Children Undergoing Surgery at Selected Hospital, Chennai.

Objectives of the Study

1. To assess the level of anxiety before and after pre- operative virtual OT tour in the control and experimental group of children undergoing surgery.
2. To determine the effectiveness of pre- operative virtual OT tour upon the level of anxiety by comparing the level of anxiety before and after pre-operative virtual OT tour in the control and experimental group of children undergoing surgery.
3. To determine the level of satisfaction regarding pre-operative virtual OT tour in the experimental group of children undergoing surgery.
4. To find out the association between selected demographic variables and the level of anxiety before and after pre-operative virtual OT tour in the experimental and control group of children undergoing surgery.
5. To find out the association between selected clinical variables and the level of anxiety before and after pre-operative virtual OT tour in the control and experimental group of children undergoing surgery.

Operational Definitions

Effectiveness

In this study, effectiveness refers to the outcome of pre-operative virtual OT tour with regard to the difference in the levels of anxiety in children undergoing surgery. It is measured in terms of anxiety scores using Facial Image scale for Anxiety.

Pre-operative Virtual OT Tour

In this study, it refers to the orientation of the parents and the child undergoing surgery to the Operation Theatre using video tapes. The video show is of about 7 minutes' duration. It includes the Operation Theatre set-up as well as the health personnel who will take care of the child during and after surgery.

Anxiety

In this study, it refers to the subjective, non-specific feeling of uneasiness, tension or apprehension arising due to surgery as measured by the Facial Image scale for Anxiety. The anxiety is measured prior to the pre-operative virtual OT tour, post to the pre-operative virtual OT tour, immediately before surgery in the OT and during the immediate post-operative period.

Children

In this study, children refer to any boy or girl in the age group of 8 – 16 years in the pre-operative period admitted in the selected hospital, Chennai.

Surgery

In this study, it refers to any elective operative procedures which are done in the Operation Theatre of the selected hospital, Chennai.

Operation Theatre

In this study, it refers to the procedure room in the hospital where surgeries are conducted.

Assumptions

The study assumed that

- Anxiety is a universal phenomenon which is found in every hospitalized child.
- Separation from parents is a stressful situation for the child.
- Desensitization can produce considerable reduction in anxiety.

Null Hypotheses

H_{01}: There will be no significant difference in the level of anxiety before and after pre- operative virtual OT tour in the control and experimental group of children undergoing surgery.

H_{02}: There will be no significant association between the selected demographic variables and the level of anxiety before and after pre- operative virtual OT tour in the control and experimental group of children undergoing surgery

H_{03}: There will be no significant association between the selected clinical variables and the level of anxiety before and after pre operative virtual OT tour in the control and experimental group of children undergoing surgery.

Delimitations

The study was delimited to

- Children who are admitted in Apollo Children's Hospital.
- Children who are aged between 8 – 16 years.

Conceptual Framework of the Study

The conceptual framework for a particular study is the abstract, logical structure that enables the researcher to link the findings to the nursing body of knowledge. Conceptual framework formalizes the thinking process so that others may read and know the framework of reference that is basic to the research problem. The framework is built from a set of concepts linked to a plan or existing system of methods, behaviours, functions and objectives.

It is developed from an existing theory of interest and proposing relationship among them. The model gives direction for planning research design, data collection and interpretation of findings. (Polit & Beck, 2004)

The present study aims to assess the effectiveness of pre-operative virtual OT tour upon anxiety in children undergoing surgery. The framework of the study is based on 'Weidenbach's Helping Art of Clinical Nursing theory'.

Ernestine Weidenbach's Helping Art of Clinical Nursing theory (1964) describes a defined situation and a way to attain it.

This theory has three factors:

- Central purpose
- Prescription
- Realities

Central Purpose

It refers to what the investigator wants to accomplish. It is the overall goal towards which the investigator strives. In this study, it refers to the management of anxiety in children undergoing surgery.

Prescription

It refers to the care plan for the participants under study. It will specify the nature of action that will fulfil the investigator's central purpose. In this study it refers to the intervention planned by the investigator who will give a pre-operative virtual OT tour for children undergoing surgery who will fulfil the sampling criteria.

Realities

It refers to the physical, physiological, emotional and spiritual factors that come into play in a situation involving investigator action. The five realities identified by Weidenbach's are agent, recipient, goal, means, activities and framework

In this study it refers to the following

- Agent : Investigator.
- Recipient : Children undergoing surgery who are in the age group of 8 – 16 years.

- Goal : To check the effectiveness of pre- operative virtual Operation Theatre tour upon anxiety in children undergoing surgery.
- Means : Pre-operative virtual OT tour on selected samples of children undergoing surgery.
- Framework: Apollo Children's Hospital.

The conceptualization of nursing practice according to this theory consists of three steps

Step I – Identifying the need for help.

Step II– Ministering the needed help.

Step III– Validating that the need for help was met.

Step I: Identifying the need for help

This step involves determining the need for help. The severity of anxiety among children undergoing surgery was assessed. Systematic random sampling technique was used to select the participants for experimental study. The severity of anxiety was assessed by using Facial Image Scale for Anxiety in children.

Step II : Ministering the needed help

After the assessment of anxiety, pre-operative virtual OT tour was given to the children undergoing surgery.

Step III: Validating that the need for help was met

It is accomplished by means of assessing the anxiety after pre-operative virtual OT tour. It is followed by analysis of the findings.

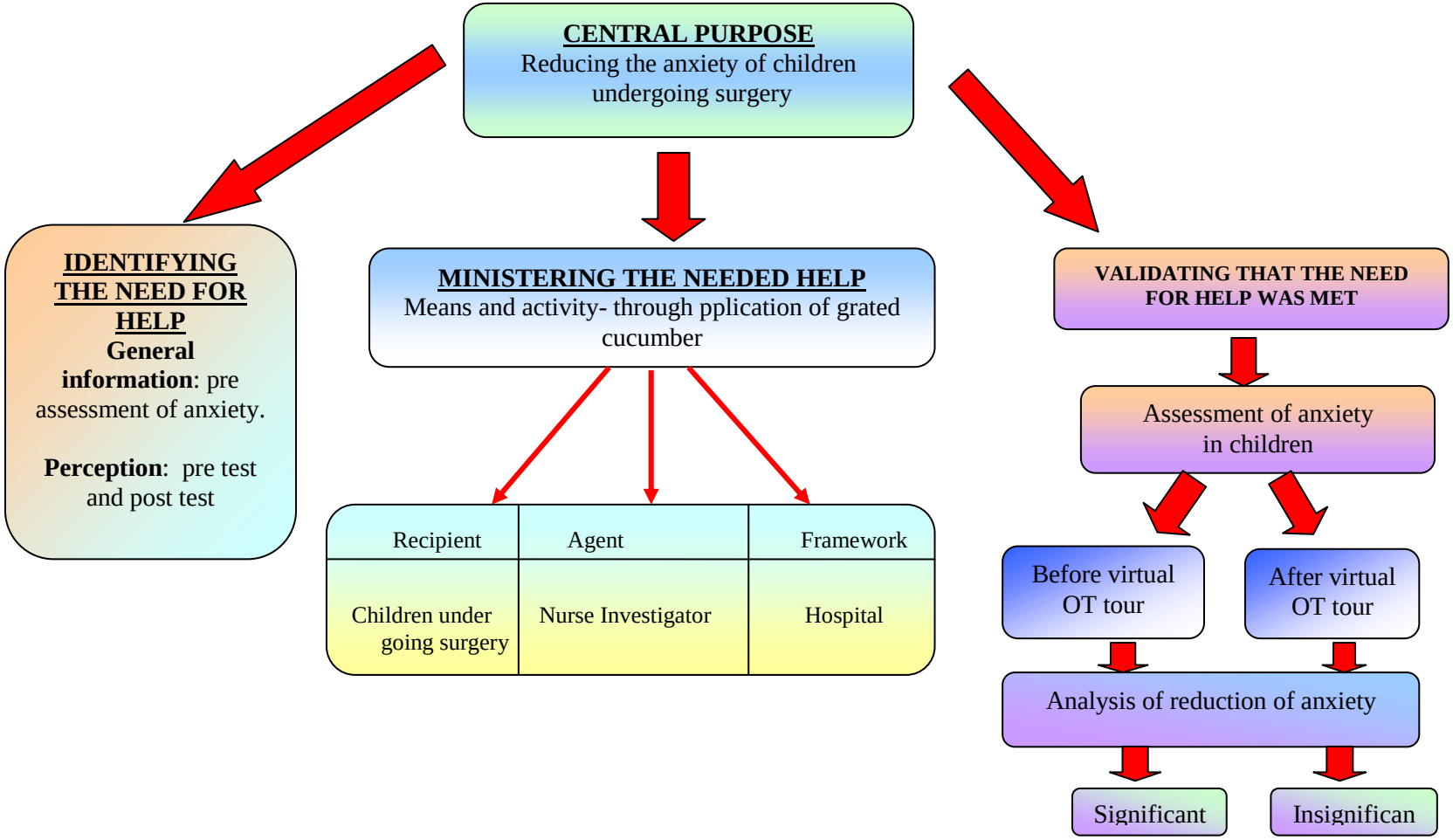

Fig. 1 Conceptual Framework based on Wiedenbach's Helping Art of Clinical Nursing

Projected Outcome

This study will be useful to reduce the pre-operative anxiety of children undergoing surgery. In turn, it will help in reducing the post operative anxiety among those children which will directly influence the prognosis.

Summary

This chapter has dealt with the background, need for the study, and statement of the problem, objectives, operational definitions, research hypothesis, assumptions, delimitations and conceptual framework.

Organization of the Report

Further aspects of the study are presented in the following five chapters.

In Chapter – II : Review of literature

In Chapter – III : Research methodology includes research approach, research design, setting, population, sample and sampling techniques, tool description, content validity and reliability of tools, pilot study, data collection procedure and plan for data analysis.

In Chapter – IV : Analysis and interpretation of data

In Chapter – V : Discussion

In Chapter – VI : Summary, conclusion, implications and recommendations.

CHAPTER II

REVIEW OF LITERATURE

A literature review is an organized written presentation of what has been published on a topic by scholars (Burns & Groove, 2004). This chapter deals with a review of published and unpublished research studies and from related material for the present study. The review helped the researcher to develop an insight into the problem area. This helped the researcher in building the foundation of her study.

The review of related literature for the current study is categorized under the following headings

- **Literature related to pre-operative anxiety level of children undergoing surgery.**
- **Literature related to interventions to reduce anxiety in children undergoing surgery.**
- **Literature related to pre-operative virtual OT tour upon anxiety level of children**

Literature related to Pre-Operative Anxiety Level of Children Undergoing Surgery

Mayes (2011)conducted a descriptive study among 100 children of varying age from 3 - 10 years aimed at evaluating anxiety-related aspects affecting children and parents in the preoperative period .Some children(23%) talked about their fears, while others (65%)showed anxiety through behavior changes. Many (45%) looked scary and become agitated with deep breathe, shivering and stopped talking. A few

(13%) developed even unexpected urinary incontinence. He concluded that the origin of pre-operative fears included the children's fear of separation from their parents, uncertainty related to anesthesia, surgery and surgical outcome. Fear of pain, death or hearing strange sounds is also a source of children's anxiety.

A comparative study was conducted by Edelmann, (2009) on pre-operative anxiety among adult female patients [n =277] and mothers of children [n =353] undergoing surgery. Data was collected in the pre-operative holding area about one hour before surgery. Adult patients (44%) and mothers (56%) completed demographic information and measures of anxiety by STAI and Miller Behavioral Style Scale (MBSS). The results showed that the mothers of children were more anxious than the adult female patients.

Sorlie (2007),explained in his study various aspects of the hospital experience that produce stress for children which include unfamiliar faces, places and routines, hospital food, clothing and play, exposure and touching of private parts by strangers, medical jargon, pain and shame and witnessing of parental anxiety. A descriptive study was conducted in Yale University on 159 parents to assess the ability of predicting children's anxiety with anesthesia induction. Mothers [n =120] or fathers [n =39] predicted their child's anxiety using a visual analog scale. On the other side, the observer used Yale Pre-operative Anxiety Scale (YPAS) for children and State Trait Anxiety Inventory for parents. Findings showed that there was a significant difference in prediction of child's anxiety between mothers and fathers. The mothers were not able to predict the child's anxiety as their anxiety level was more (63%). The study concluded that father's prediction of child's anxiety was moreover the same as the child's observed anxiety measured by the observer at induction.

A study was conducted in 2005 by Stoddard on the pre-operative coping of children and its effect on post-operative outcome. Ninety children aged 8-17, participated. Data was collected the day before the surgery, the second post-operative day and on the third, sixth and ninth month of recovery period. Findings revealed that avoidant coping was associated with less anxiety and vigilant coping was associated with return to normal activities over the course of recovery.

Thompson (2004) conducted a study to examine the emotional impact of anticipated hospitalization among 8-12 year old children scheduled for elective tonsillectomy. Specifically, the study explored the ways that social support and information seeking behavior had an impact on the anxiety of children undergoing surgery. The sequence of the child interview began by first administering the children's social support interview schedule developed by the investigator followed by State Trait Anxiety inventory. The main finding of this study was that children using information seeking strategies were successful as measured by low anxiety levels in managing the stress of anticipated hospitalization.

Literature related to Interventions to Reduce Anxiety in Children Undergoing Surgery

Furze (2009) performed a study on 204 patients waiting for CABG in which the primary outcome was anxiety and suggested that physical functioning and cardiac misconceptions can be reduced if nurse counseling is provided to the patients prior to CABG along with the cognitive behavioral intervention

Liu Xi (2009) conducted a study to assess the influence of preoperative visiting on the anxiety of patients undergoing cardiosurgery.60 patients scheduled to

receive cardio surgery were divided into two groups: the visiting group and the control group. All patients had anxieties of varying degrees before the operation. The degree of anxiety on the day before operation was much higher than that of the anxiety on the third day after admission. The degree of anxiety one day before the operation was slightly lower than that of the control, indicating that preoperative visiting can relieve anxiety of patients, and would help them to look upon the coming operation more positively.

In 2008,a cross sectional study was conducted by Richman et al., in developed and developing countries among health care professionals [n =780] and parents [n =957] to analyze the cultural belief of child care and parental presence during induction of anesthesia. The selected samples completed a questionnaire regarding child care and parental presence. Data showed that parents in developed and developing countries were likely to be present during anesthesia induction. Most of the staff members in developed countries felt that parental presence was very important. This study proved that there is a strong association between cultural belief and perception of peri-operative care in both developed and developing countries.

Laura (2005) conducted an experimental study in Italy on 40 samples to determine the effects of presence of clowns on pre-operative anxiety of children and their parents during induction of anesthesia. Samples were randomly assigned to the clown group (n =20) in which children were accompanied by the clown and a parent. The control group (n =20) was one in which children were accompanied by only one parent. The child's anxiety was measured through modified YPAS and that of the parents through STAI. The results showed that the anxiety level in the

clown group was significantly (P<0.001) less than in the control group. The parents in the clown group were less anxious than those in the control group. Hence the study concluded that the presence of clowns during induction of anesthesia was an effective intervention for managing child and parental anxiety.

National task force (2000) defines patient education as the process of influencing behavior, producing changes in knowledge, attitude and skill required to maintain and improve health. The process may begin with the imparting of information, but it also includes interpretation and integration of information in such a way as to bring about attitudinal or behavioral changes that benefit a person's health status.

Kapnoullas (1999) stated that in early 70's, it was believed that a lack of education or knowledge to the patient would be helpful in reducing anxiety and fear in patients regarding forthcoming events, but presently, it is quite understood that lack of patient knowledge may cause anxiety and could lead to another cardiac event.

Literature related to Pre-Operative Virtual OT tour Upon Anxiety

It is an established fact that the parents of children undergoing surgery experience significant anxiety and fear during the pre-operative period. The management of parental pre-operative anxiety is challenging because pharmacological interventions are not feasible, hence non pharmacological interventions have been suggested in many areas.

In 2008, Cornelie conducted a study to assess the effectiveness of detailed video-assisted anesthesia risk education on patient anxiety. Two hundred and nine

consecutive patients who visited the anesthesia clinic before major operations were randomly assigned to one of three groups: non-video (Group 1), video-before-interview (Group 2), and video-after-interview (Group 3). Anxiety levels were measured before and after the interview using the state trait anxiety inventory and visual analog scale (anxiety). Patient knowledge regarding anesthesia technique, anesthesia-related risks, and patient satisfaction were assessed after the interview, using standardized questionnaires. Patient knowledge was significantly higher in the video groups compared with the non-video group. The duration of the pre-anesthetic interview was significantly extended in Group 2 (video-before) compared with Group 1 (no-video), and Group 3 (video-after). This difference was even more profound in subgroups of patients scheduled for anesthesia techniques with invasive monitoring**.**

Sorlie (2007) explained the positive impact of video information in combination with individualized session. In this study, the video information regarding the surgery was given to the patients preoperatively and at the time of admission. All the questions from the patient were answered.

Patel (2006) conducted a randomized, prospective study on 112 children aged 4–12 years undergoing outpatient surgery. The anxiety level was assessed after admission and again at mask induction of anesthesia using the modified Yale Preoperative Anxiety Scale . Post-operative behaviour changes were assessed with the Post hospital Behaviour Questionnaire. Patients were randomly assigned to three groups: parent presence (PP), PP and a hand-held Video(V), and PP and 0.5 mg/kg oral midazolam (M) was given >20 min prior to entering the operating room. There was a statistically significant increase in the anxiety level ($P < 0.01$) in groups M

and PP at induction of anesthesia compared with baseline, but not in V group. V patients demonstrated a decrease in anxiety from baseline, the difference compared with PP was significant (P = 0.04).

A quantitative study was conducted (2005) in Florida by Cooke on parents to determine the effects of viewing an educational videotape about paediatric anesthesia on pre-operative anxiety and parental knowledge of anesthesia. Parents were randomized into experimental group who viewed videotape about pediatric anesthesia (n= 43) and control group who viewed videotape about natural scenery (n =42). Before and after immediately viewing the videotape, parents completed measures of situational anxiety by State Trait Anxiety Inventory and pre-operative need for information by Amsterdam Pre-operative Anxiety and Information Scale . Data showed that the parents who viewed the experimental videotape showed a significant increase in knowledge about anesthesia (P <0.022) and a reduction in anxiety [P<0.0001] when compared with the control group. The results demonstrated that videotape viewing facilitated pre-operative preparation and lessened pre-operative anxiety.

Asilioglu (2004) have reported in their study that patients undergoing open heart surgery who received preoperative education will have low score of anxiety as compared to those who have not got the education preoperatively.

Spalding (2003), conducted a study to reduce anxiety by pre-operative education to make the future familiar. The purpose of this research was to gain understanding on how the pre-operative education process is beneficial in reducing anxiety for patients awaiting a total hip replacement provided in a National Health Service Trust in England. The participants in this study were a convenient sample of

health care professionals who presented information on pre-operative education during a nine-month data collection period, and a sample of patients who attended the programme. Data was collected and the results showed that patient education can reduce anxiety by making the unknown familiar. Such familiarity can be achieved in three ways - providing an understanding of the experiences patients will encounter during and after surgery, giving an opportunity to meet the staff that will be caring for them, and familiarizing patients with the environments they will meet when in hospital.

A Meta analysis was conducted in Hong Kong in 2005 on 15 randomized control trials [n =1506] to compare the effectiveness of media based education about anesthesia. The media used 15 randomized control trials which included pamphlet, video, booklets, audiotape, and internet. These were used to assess the reduction of anxiety levels in parents and children. The results showed that anxiety level before anesthesia was less intense in subjects receiving the video and printed information about general processes and anesthesia for patient education before surgery.

Summary

This chapter has dealt with the review of literature related to the problem stated. The literatures presented here were extracted from 16 primary and 2 secondary sources. It has helped the researcher to understand the impact of the problem under study. It has enabled the investigator to design the study, develop the tool, plan the data collection procedure, and to analyze the data.

CHAPTER III

RESEARCH METHODOLOGY

The methodology of the research study is defined as the way, the data is gathered and analysed in order to answer the research questions or analyse the research problem. The research methodology involves a systematic procedure by which the researcher starts from an initial identification of the problem to find its conclusion (Polit & Beck,2008).

This chapter deals with a brief description of different steps undertaken by the investigator for the study. It includes research approach, research design, the setting, population, the sample and sampling technique, development and description of tool, content validity, reliability, pilot study, protection of human rights and procedure for data collection and plan for data analysis.

Research Approach

Research approach is the most significant part of any research. According to Polit and Beck (2008), an experimental research is an extremely applied form of research and involves finding out how well a programme and the practice of policy are working. Its goal is to assess or evaluate the success of the programme.In this study the researcher assessed the effectiveness of the pre-operative virtual OT tour upon anxiety in children undergoing surgery by using experimental research approach.

Research Design

The overall plan for addressing a research question including specifications for enhancing the study's integrity is called a research design. A research design incorporates the most important methodological design that a researcher works on conducting a research study (Polit and Beck 2008)

A true experimental research design (Time series design) was used in the study

R O1 - O2 O3 O4

R O1 X O2 O3 O4

O1 -Pre test prior to pre-operative virtual OT tour.

O2 - Post test after pre-operative OT tour.

X - pre-operative virtual OT tour.

O3-post test immediately before surgery by a staff nurse in OT.

O4-post test after immediate post operative period.

Variables

Dependent variable

The variable hypothesized to depend on or be caused by another variable is the dependant variable (Polit & Beck,2008). In this study the dependent variable was the anxiety of children undergoing surgery.

Independent variable

The variable that is believed to cause or influence the dependant variable is the independent variable (Polit & Beck, 2008).In this study independent variable was the pre-operative virtual OT tour.

Attribute variable

Variables that describe the study sample characteristics are termed as attribute variables (Polit & Beck, 2008). In this study, attribute variables were the demographic variable proforma and clinical variable proforma of children undergoing surgery.

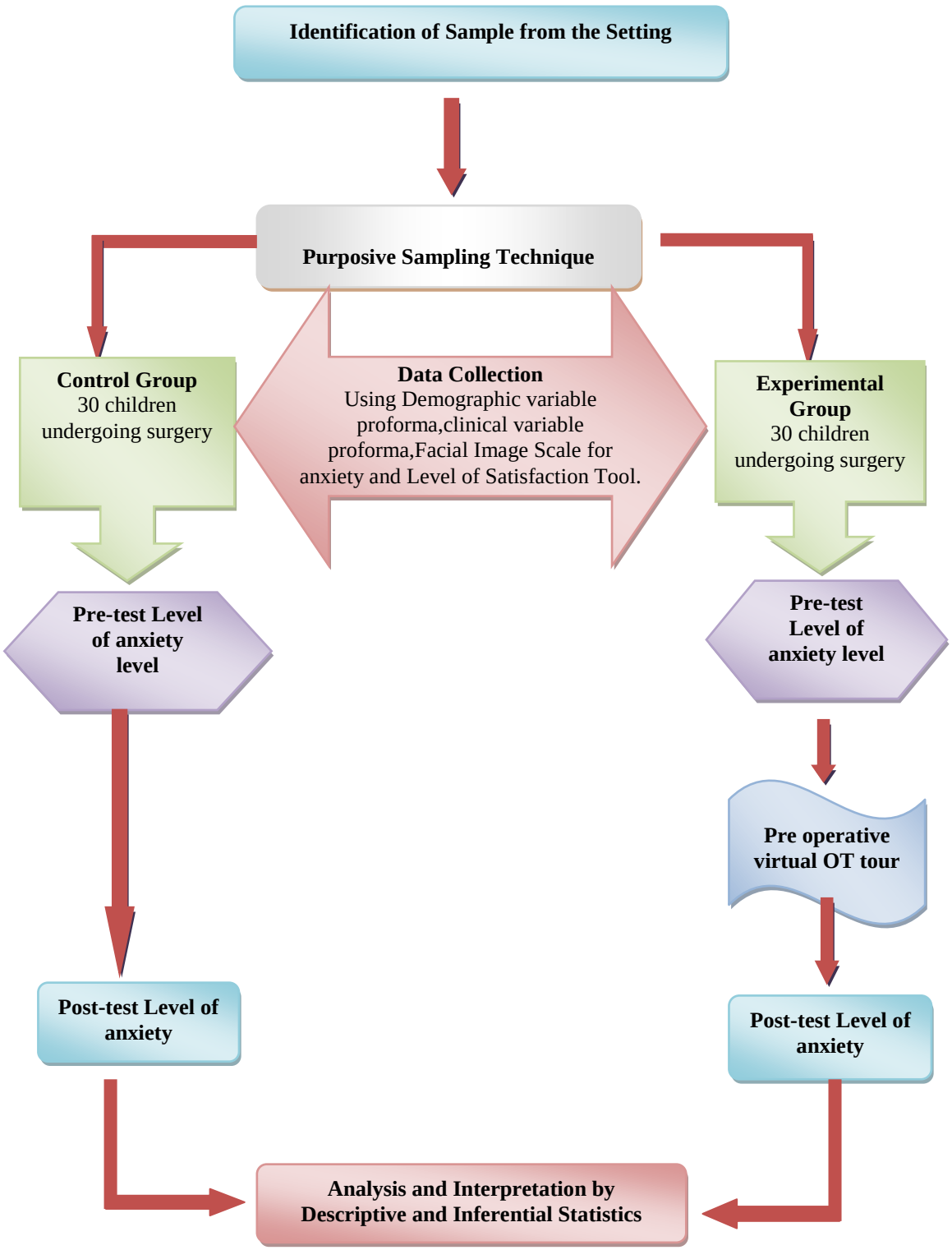

Fig. 2 Schematic Representation of the Research Design

Research Setting

Research setting is the physical location and conditions in which the data collection takes place in a study (Polit & Beck, 2008).The present study was conducted at Apollo Children's Hospital, Chennai. It is an 80 bedded hospital under the administration of Apollo Main Hospital situated in Chennai. It is a multi-specialty tertiary centre for pediatrics with facilities like Neonatal Intensive Care Unit), Pediatric Intensive Care Unit(PICU),Cardio-Thoracic Intensive Care Unit(CTICU), Pediatric Emergency Services and subspecialties and is equipped with High Frequency oscillation ventilator,3D Echo Doppler, Computed Tomography and Magnetic Resonance Imaging. The researcher collected data from Sunshine ward (Pediatric General ward) and the Operation Theatre.

Population

Population is the entire set of individuals or objects having some common characteristics (Polit & Beck, 2008).

Target population

The target population is the aggregate of cases in which a researcher is interested and would like to generalize the study results (Polit & Beck, 2008).In this study, the target population comprises of all children in the pre-operative period.

Accessible population

The accessible population is the aggregate of cases that conforms to designated criteria and are accessible as subjects for a study (Polit & Beck, 2008). In this study the accessible populations are all children admitted for surgery in Apollo

Children's Hospital Chennai who met the inclusion criteria during the data collection period

Sample

According to Polit & Beck (2008), a sample is a subset of a population selected to participate in a study. Sample size for the present study was 60 children undergoing surgery, 30 in the control and 30 in the experimental group who satisfied the inclusion criteria.

Sampling Technique

It was stated by Polit & Beck (2008) that sampling is a process of selecting a portion of the population to represent the entire population. The participants for the present study were selected by systematic random sampling.

Sampling Criteria

Inclusion criteria

- Children of age 8-16 years
- Children who were admitted pre operatively for elective surgeries.
- Children who were willing to participate in the study.
- Children who were able to understand English, Tamil or Malayalam.

Exclusion criteria

- Children who were seriously ill.
- Children posted for emergency surgery.
- Children who were deaf, blind or with any developmental delay.
- Children who were posted for major surgeries.

Selection and Development of Study Instruments

The study aimed at evaluating the effectiveness of pre operative virtual OT tour upon anxiety of children undergoing surgery. Data collection instruments were developed through extensive review of literature, consultation with experts and opinion from faculty members.

The instruments used in the study were demographic variable proforma, clinical variable proforma, Facial Image Scale – Anxiety and rating scale to assess the level of satisfaction of children in the experimental group.

Demographic variable proforma

Demographic variable proforma of children undergoing surgery consisted of information regarding age, gender, religion, type of family, area of residence, monthly income and educational status of parents.

Clinical variable proforma

Clinical variable proforma of children undergoing surgery consisted of diagnosis, type of surgery, previous hospitalization, previous surgeries, previous exposure to any videos of surgery and mode of ventilation of fear and anxiety.

Facial Image Scale – Anxiety

This is a standardized tool to assess anxiety of children developed by Dr. Heather Buchanan, Division of Psychology, University of Derby. This scale consists of a row of 5 faces ranging from very happy to very unhappy. The image scores ranges from 1 to 5.

Score interpretation

Score	Interpretation
1	No anxiety
2	Mild anxiety
3	Moderate anxiety
4	Severe anxiety
5	Worst anxiety

Rating scale to assess the level of satisfaction of children in experimental group

This was developed by the investigator to assess the satisfaction regarding pre operative virtual OT tour among the experimental group of children.

This was a 4 point scale ranging from 1 – 4 (strongly disagree, disagree, agree, strongly agree).Thus the total obtainable score is 60.

Scoring interpretation

Scoring	Interpretation
≥ 50	High satisfaction
25 – 49	Moderate satisfaction
≤ 34	Low satisfaction

Psychometric Properties of the Study Instruments

Validity

Content validity is the degree to which an instrument measures what it is supposed to measure. Content validity is the sampling adequacy of the content being measured (Polit & Hungler, 2007).

Facial Image Scale for anxiety is a standardized and valid tool developed by Dr. Heather Buchanan and was used in this study. The content validity of the other tools was obtained by getting opinions from seven experts. The experts have suggested some specific modifications in the demographic variable proforma and clinical variable proforma of children, and rating scale on level of satisfaction regarding pre-operative virtual OT tour in the experimental group of children undergoing surgery. The modifications and suggestions of experts were incorporated in the final preparation of the tool.

Reliability

Reliability is the degree of consistency with which an instrument measures the attribute which is designed to measure (Polit & Hungler 2007).

Facial image scale for anxiety

Facial image scale for anxiety has the test- retest correlation of 0.94 over a week. The reliability Facial Image Scale for anxiety is established by test-retest method and the reliability score was 0.92 that was assessed by using Pearson's correlation and was found to be highly reliable.

Rating scale on satisfaction regarding pre-operative virtual OT tour

The tool was assessed through split half method was highly reliable and found to be 0.84 by Pearson's correlation.

Pilot Study

Polit & Beck (2004) stated that a pilot study is a miniature version of actual study in which the instruments are administered to the subjects drawn from the same population.

The purpose is to find out the feasibility and practicability of the study design. The pilot study was conducted among 12 children undergoing surgery in Apollo Children's Hospital, Chennai. The pilot study revealed that the present study was feasible to conduct.

Protection of Human Rights

- The study was conducted after the approval of the ethical committee, Apollo Hospitals, Chennai.
- Obtained permission from Principal, Apollo College of Nursing, HOD of Paediatric Nursing Department and Nursing Superintendent of Apollo Children's Hospital where the study was conducted.
- The participants were explained about the study and written consent was obtained after providing assurance and developing confidence.
- Confidentiality of the data was maintained throughout the study.

Data Collection Procedure

Data collection is gathering information about something which the researcher has chosen to explore or investigate (Crookes and Davies, 1998).The investigator collected the data from Apollo Children's hospital after obtaining

proper administrative permission from the concerned authorities. The data collection period was from June 24th till July 24th 2012.The investigator prepared a video of about 7 minutes' duration on preparing children for surgery.

Systematic sampling method was used. After an initial introduction, the investigator obtained consent from the subjects to participate in the study. An assurance was given regarding confidentiality before the data collection procedure. The demographic and clinical variables of children undergoing surgery were also collected by the interview method. A Facial Image Scale for anxiety was administered to the participants and their anxiety level was found in both the control and experimental groups before the pre-operative virtual OT tour

The pre-operative virtual OT tour was then individually given for the experimental group of children undergoing surgery. The pre-operative virtual OT tour comprised of a video of about 7 minutes' duration which included the sequence of events a child has to undergo from the time of admission till discharge after surgery. Adequate explanations were provided regarding each procedure and the doubts of the children and parents were clarified. Then the anxiety level was assessed in the Operation Theatre by the staff nurses in OT and during the immediate post-operative period for both the control and experimental group of children undergoing surgery using Facial Image Scale. Level of satisfaction regarding pre-operative virtual OT tour was also assessed in the experimental group of children undergoing surgery. On the whole pre-operative virtual OT tour was found to be feasible and acceptable.

Problem Faced during Data Collection

The problem faced by the researcher during this study was that certain parents were not interested in participating in the study.

Plan for Data Analysis

Data analysis is the systematic organization and synthesis of research data and testing of null hypotheses by using the obtained data (Polit & Beck, 2004). Analysis and interpretation of data were carried out with descriptive and inferential statistics.

Descriptive statistics such as mean, median, frequency, standard deviation and percentage were used to describe the demographic variables, clinical variables and to assess the anxiety of children undergoing surgery.

Inferential statistics such as‘t’-test was used to analyze the difference in anxiety scores between pre and post tests of the control and experimental group. The association between the selected demographic variables, clinical variables and the anxiety of children undergoing surgery was assessed by using Chi-square test.

Summary

This chapter dealt with the selection of research approach, research design, setting, sample, sampling technique, sampling criteria, selection and development of study instruments, psychometric properties of study instruments, pilot study, and protection of human rights, data collection procedure and plan for data analysis. The following chapter deals with the analysis and interpretation of data using the descriptive and inferential statistics.

CHAPTER IV

ANALYSIS AND INTERPRETATION

This chapter deals with analysis and interpretation of data collected on a number of issues from various sources. Statistics is a field of study concerned with techniques or methods of data collection, classification, summarising, interpretation, drawing inferences, testing of hypothesis, making recommendations etc. (Mahajan 2004)

Data was collected from 60 children undergoing surgery in Apollo Children's Hospital of which 30 were in the control group and 30 were in the experimental group to determine the effectiveness of pre-operative virtual OT tour upon anxiety of children undergoing surgery. The data were analysed according to the objectives and hypothesis of the study.

The data was analysed, tabulated and interpreted using descriptive and inferential statistics.

Organisation of the Findings

The findings of the study were organized and presented under the following headings:

- Frequency and percentage distribution of selected demographic variables in the control and experimental group of children.

- Frequency and percentage distribution of selected clinical variables in the control and experimental group of children.

- Frequency and percentage distribution of anxiety level of children undergoing surgery measured by Facial Image Scale.

- Comparison of mean and standard deviation of anxiety levels in the control and experimental groups of children undergoing surgery measured by Facial Image Scale.

- Frequency and percentage distribution of level of satisfaction on pre-operative virtual OT tour in the experimental group of children.

- Association between the selected demographic variables and anxiety level of children in the control and experimental group using Facial Image Scale.

- Association between the selected clinical variables and anxiety level of children in the control and experimental group using Facial Image Scale.

Table 1. Frequency and Percentage Distribution of Demographic Variables in the Control and Experimental Group of Children

Demographic variables	Control (n=30)		Experimental (n=30)	
	n	p	n	p
Age of the child(yrs)				
8-10	6	12	7	23
11-12	12	40	12	40
13-14	8	27	9	30
15-16	4	13	2	7
Education of the child				
Not started	-	-	-	-
Primary	20	66	21	70
Secondary	10	34	9	30
Religion				
Hindu	14	47	13	50
Muslim	7	23	10	34
Christian	7	23	7	23
Area of residence				
Urban	22	73	20	66
Rural	8	27	10	34
Any other	-	-		
Family income per month in rupees				
< 10,000	-	-	-	-
10001 – 15000	-	-	-	-
15001 – 20000	3	10	7	23
>20001	27	90	23	77
Educational status of mother				
Non -literate	-	-	-	-
Primary	1	3	-	-
Secondary	15	50	5	17
Higher secondary	9	30	11	37
Graduate	5	17	14	46
Educational status of father				
Non- literate	-	-	-	-
Primary	-	-	-	-
Secondary	3	10	1	3
Higher secondary	11	33	10	34
Graduate	16	57	19	63

The above data reveals that majority of the children in the control and experimental groups were doing their primary education (66%, 70%), belonged to nuclear family (77%, 63%), lived in urban area (73%, 66%) with a family income >Rs.20,001(90%,77%). Significant percentage of children in the control and the experimental groups were between the age group of 11-12yrs (40%,40%) and belonged to the Hindu religion (47%,50%). In control group most of the fathers were graduates (57%) and mothers had undergone secondary education (50%) whereas in experimental group most of the parents were graduates (63%).

Fig.3 depicts that significant percentage of children in control group (53%) were males and in experimental group males and females were equal in number.

Fig.4 shows that majority of the children undergoing surgery (77%.63%) in both control and experimental group belonged to nuclear family.

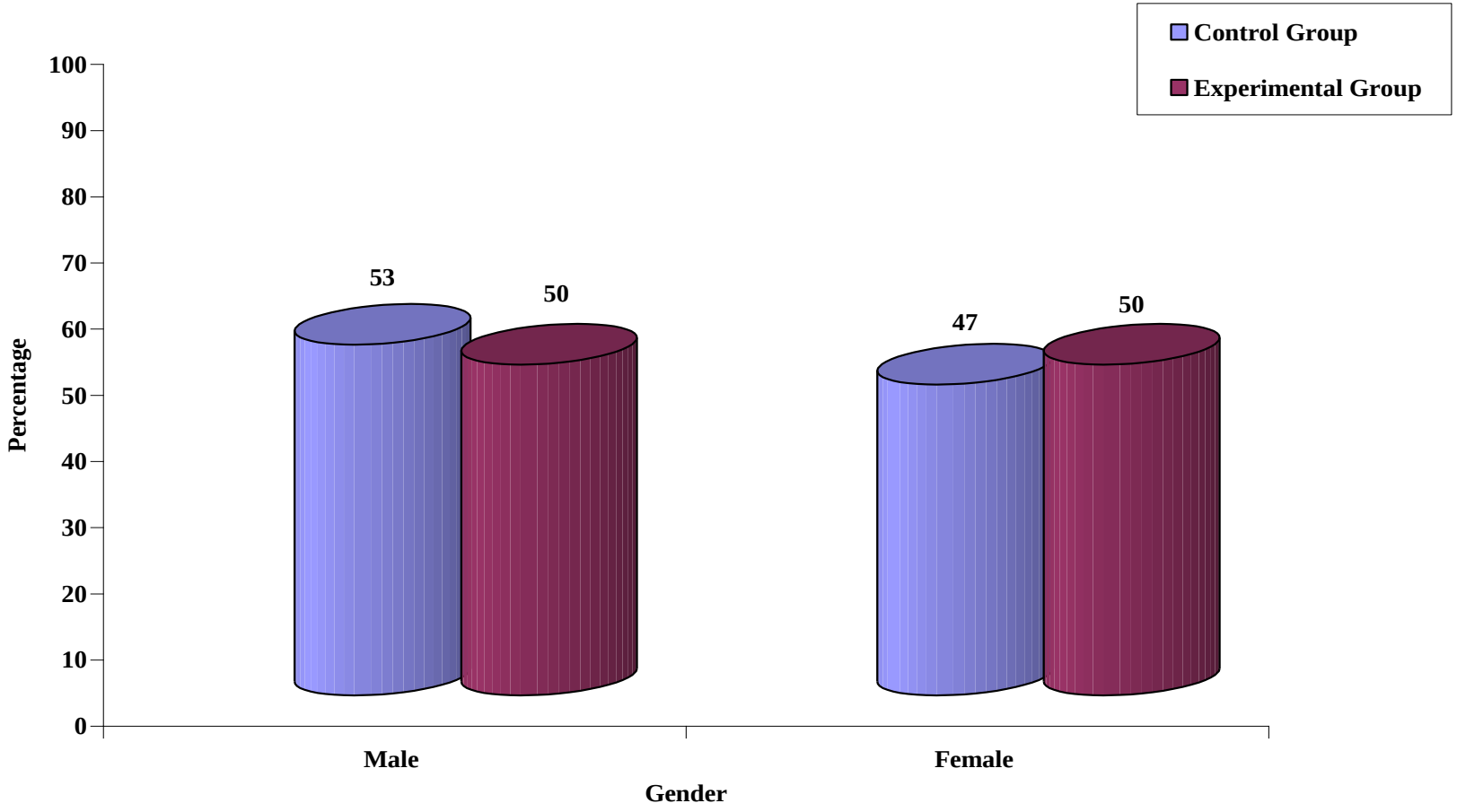

Fig. 3 Percentage Distribution of Gender of Children Undergoing Surgery

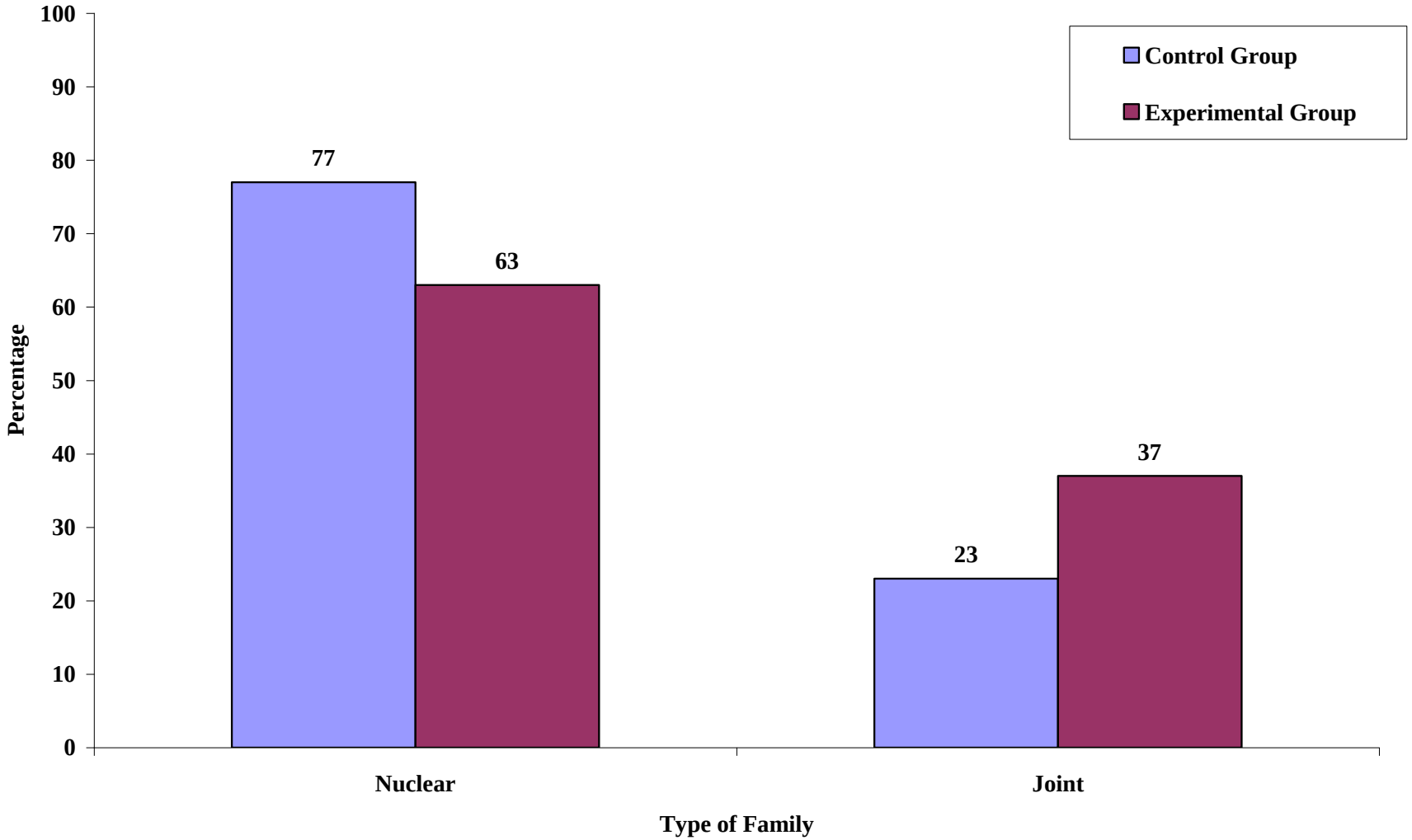

Fig. 4 Percentage Distribution of Type of Family of Children Undergoing Surgery

Table 2. Frequency and Percentage Distribution of Clinical Variable in the Control and Experimental Group of Children

Clinical variables	Control Group (n=30)		Experimental Group (n=30)	
	n	p	n	p
Diagnosis				
Gastrointestinal	3	10	4	**13**
Musculoskeletal	6	20	6	**20**
Neurological	5	17	3	**10**
Genitourinary	10	33	11	**37**
Cardiac	6	20	6	**20**
Type of surgery				
General	24	80	24	**80**
Laproscopic	-	-	-	**-**
Cardiac	6	20	6	**20**
Others	-	-	-	**-**
Previous hospitalization				
Yes	30	100	30	**100**
No	-	-	-	**-**
Whether seen anyone undergone surgery?				
Yes	12	40	8	**27**
No	18	60	22	**73**
Duration of illness				
Few days	1	3	1	**3**
Few weeks	10	33	12	**40**
Few months	11	37	12	**40**
Congenital	9	30	5	**17**
Mode of ventilation of fear				
Share with parents	30	100	30	**100**
Share with friends	-	-	-	**-**
Cry alone	-	-	-	**-**
Engage in diversional activities	-	-	-	**-**
To whom he/she usually ventilates fear				
Mother	24	80	21	**70**
Father	6	20	9	**30**

Clinical variables	Control Group (n=30)		Experimental Group (n=30)	
	n	p	n	p
Friends	-	-	-	-
Others	-	-	-	-
Whether previously seen any video of operation theatre				
Yes	-	-	-	-
No	30	100	30	**100**
Any prior information about surgery				
Yes	30	100	30	**100**
No	-	-	-	-
Who informed about surgery				
Doctor	30	100	30	**100**
Nurse	-	-	-	-
Relatives	-	-	-	-
Others	-	-	-	-

The data presented in table 2 shows that all children in the control and the experimental groups had a previous history of hospitalization, had received information about surgery from their doctors (100%, 100%) and none of them had seen a video of a surgery before (100%, 100%) respectively. Majority of the children in the control and experimental groups used to share their fears with their mothers (80%, 70%) respectively Significant percentage of children in the control and the experimental groups had genito- urinary problems (33%, 37%) with illness lasting few months (37%,40%) respectively..

Fig. 5 reveals that most of the children did not undergo any previous surgery (60%, 66%) in the control and experimental group respectively.

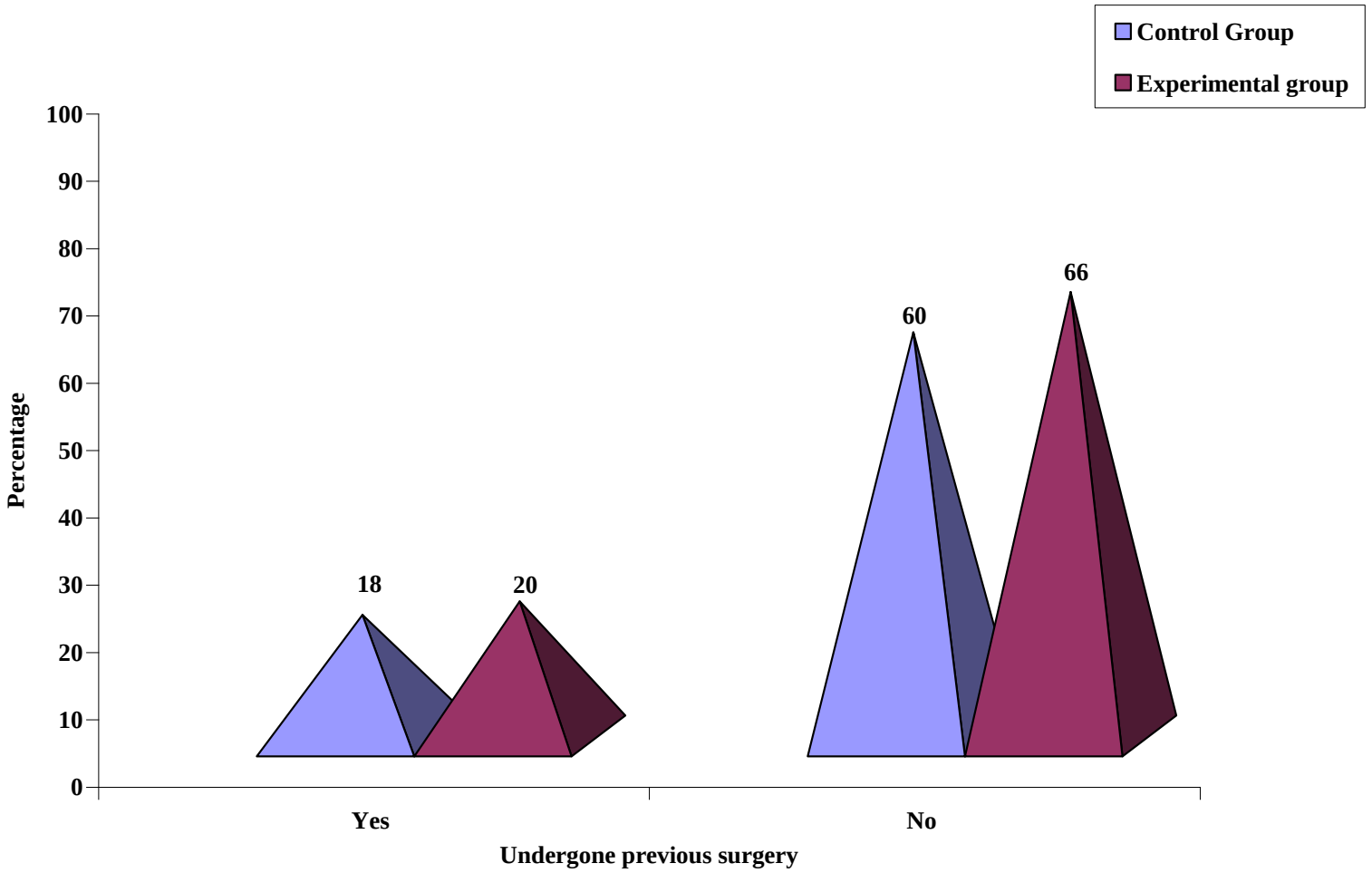

Fig.5 Percentage Distribution of Previous Surgery of Children Undergoing Surgery

Table 3. Frequency and Percentage Distribution of Anxiety Levels of Children Undergoing Surgery Measured by Facial Image Scale

Level of anxiety	Control group				Experimental group			
	Pre test		Post test		Pre test		Post test	
	n	p	n	p	n	p	n	P
No anxiety	-	-	-	-	-	-	-	-
Mild anxiety	-	-	-	-	-	-	18	60%
Moderate anxiety	-	-	-	-	-	-	12	40%-
Severe anxiety	27	90%	27	90%	27	90%	-	-
Worst anxiety	3	10%	3	10%	3	10%	-	-

The data presented in the table 3 reveals majority of children in the control group experienced severe anxiety (90%, 90%) in pretest and post test. Majority of children in experimental group experienced severe anxiety (90%) before pre-operative virtual OT tour whereas after the pre-operative virtual OT tour, severe anxiety was found to be reduced to mild anxiety (60%) and moderate anxiety (40%).

Table 4. Comparison of Mean and Standard Deviation of Anxiety Level by the Control and Experimental Group of Children Before and After Pre-Operative Virtual OT Tour Measured by Facial Image Scale

Group	Control group		Experimental group		
	M	SD	M	SD	t value
Pre test	4.1	0.3	4.1	0.3	0.31
Post test	4.1	0.3	2.4	0.49	**4*** **

***P<0.001**

The data in the table 4 depicts that the difference in mean and standard deviation of the anxiety levels of children before pre-operative virtual OT tour (M=4.1, 4.1 & SD=0.3, 0.3) between the control and experimental groups is not statistically significant (p<0.001), whereas after pre-operative virtual OT tour, there is a difference in the mean and standard deviation of anxiety levels (M=4.1, 0.3 & SD=2.4, 0.49) between the control and experimental groups of children undergoing surgery.

Fig. 6 depicts majority of the children were highly satisfied (87%) with pre-operative virtual Operation Theatre tour and none of them were dissatisfied with the intervention.

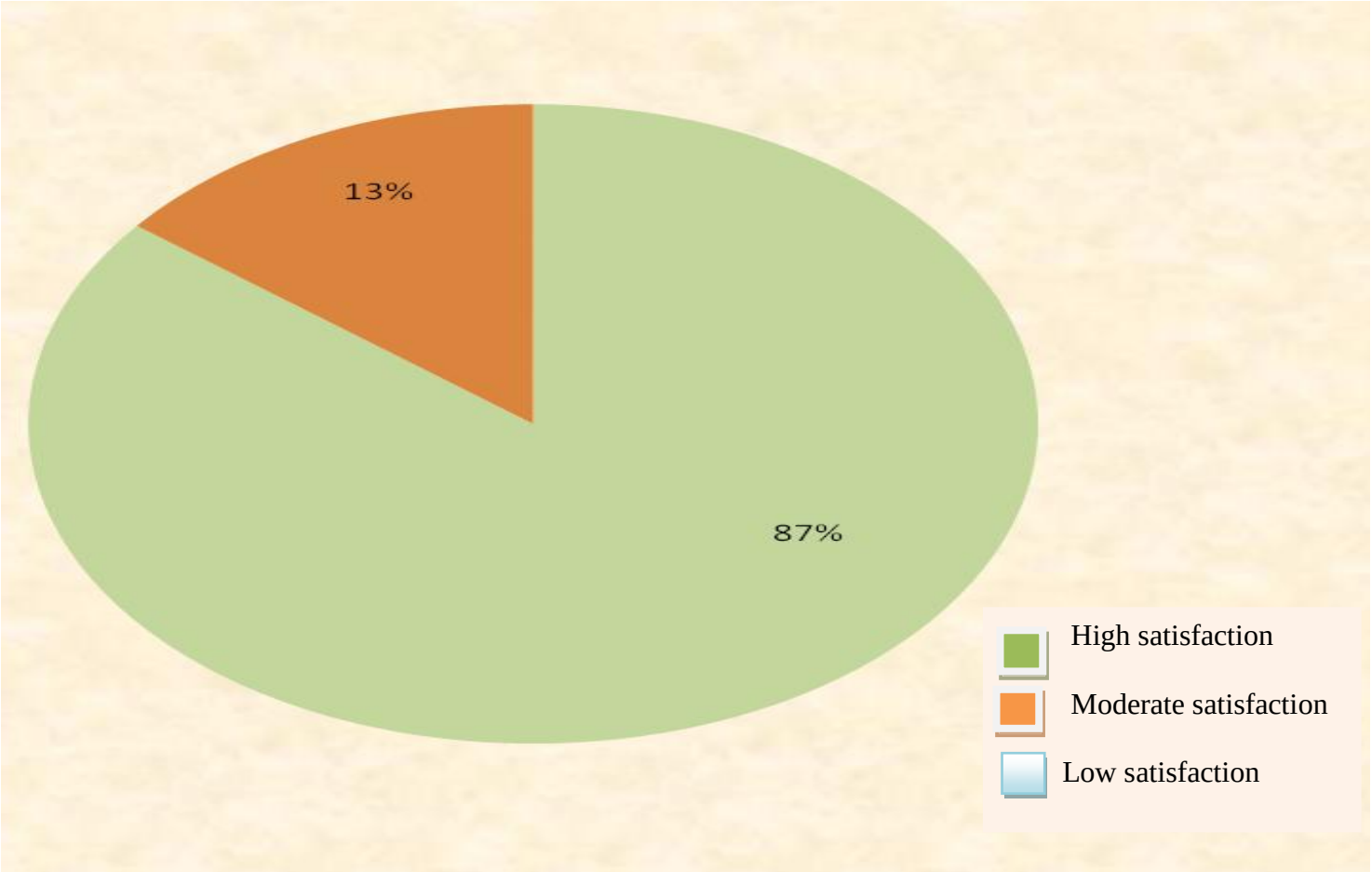

Fig. 6: Percentage Distribution of Level of Satisfaction of in the Experimental Group of Children

Table 5. Association between the Selected Demographic Variable and Anxiety of Children in Control and Experimental Group Using Facial Image Scale

Demographic Variables	Control Group (n=30)						Experimental Group (n=30)					
	Pre test			Post test			Pre test			Post test		
	Severe	Worst	χ^2	Severe	Worst	χ^2	Severe	Worst	χ^2	Mild	Moderate	χ^2
Age (in years)												
≤ 12	17	1	0.98	17	1	0.98	17	2	0.16	10	8	0.3
> 12	10	2	(df =1)	10	2	(df =1)	10	1	(df =1)	8	4	(df =1)
Gender												
Male	16	0	**3.8***	16	0	**3.8***	13	2	0.37	10	6	0.09
Female	11	3	(df =1)	11	3	(df =1)	14	1	(df =1)	8	6	(df =1)
Religion												
Hindu	12	2	2.35	12	2	2.35	12	1	3.07	7	7	0.09
Muslim	7	0		7	0		8	2		5	2	
Christian	8	1	(df =2)	8	1	(df =2)	7	0	(df =2)	6	3	(df =2)
Type of family												
Nuclear	21	2	0.19	21	2	0.19	17	2	0.16	12	11	0.62
Joint	6	10	(df =1)	6	10	(df =1)	10	1	(df =1)	7	3	(df =1)
Education of father												
≤higher secondary	15	1	0.53	15	1	0.53	5	0	0.67	9	7	0.2
>higher secondary	12	2	(df =1)	12	2	(df =1)	23	3	(df =1)	9	5	(df =1)
Education of mother												
≤higher secondary	2	1	2	2	1	2	1	0	0.12	3	0	2.22
>higher secondary	25	2	(df =1)	25	2	(df =1)	26	3	(df =1)	15	12	(df =1)

***p<0.05**

From the Table 5, it could infer that there was significant association between the selected demographic variables of the gender ($p<0.05$) of the child and anxiety level in the control group, but there was no significant association between other demographic variables and anxiety levels in the control and experimental groups.

Table 6. Association between the Selected Clinical Variable and the Anxiety Level of Children in Control and Experimental Group Using Facial Image Scale

Clinical Variables	Control Group (n=30)						Experimental Group (n=30)					
	Pre test			Post test			Pre test			Post test		
	Severe	Worst	χ^2	Severe	Worst	χ^2	Severe	Worst	χ^2	Mild	Moderate	χ^2
Diagnosis												
Gastrointestinal	3	0	7.2	3	0	7.2	4	0	5.4	2	2	2.71
Musculoskeletal	5	1	(df =4)	5	1	(df =4)	5	1	(df =4)	5	1	(df =1)
Neurological	4	1		4	1		3	0		2	1	
Genitourinary	10	0		10	0		10	1		6	5	
Cardiac	5	1		5	1		5	1		3	3	
Type of surgery												
General	22	2	0.37	22	2	0.37	22	2	0.37	15	9	0.3
Cardiac	5	1	(df =1)	5	1	(df =1)	5	1	(df =1)	3	3	(df =1)
To whom usually ventilate fear												
Father	6	0	0.83	6	0	0.83	9	0	1.43	8	1	3.8
Mother	21	3	(df =1)	21	3	(df =1)	18	3	(df =1)	10	11	(df =1)

From the Table 6, it could be inferred that there was no significant association between any clinical variable and anxiety level in both the control and experimental group.

CHAPTER V

DISCUSSION

An Experimental Study to Assess the Effectiveness of Pre-Operative Virtual OT Tour upon Anxiety among Children Undergoing Surgery at Selected Hospital , Chennai.

Objectives of the Study

1. To assess the level of anxiety before and after pre-operative virtual OT tour in the control and experimental group of children undergoing surgery.
2. To determine the effectiveness of pre-operative virtual OT tour upon level of anxiety by comparing the level of anxiety before and after preoperative virtual OT tour in control and experimental group of children undergoing surgery.
3. To determine the level of satisfaction regarding preoperative virtual OT tour in children and parents of the experimental group of children undergoing surgery.
4. To find out the association between the selected demographic variables and the level of anxiety before and after pre-operative virtual OT tour in experimental and control group of children undergoing surgery.

5. To find out the association between the selected clinical variables and the level of anxiety before and after pre-operative virtual OT tour in control and experimental group of children undergoing surgery.

An experimental design was adopted for this study. Systematic sampling technique was used to select 30 in the control group and 30 in the experimental group from Apollo Children's Hospital. The Facial Image Scale and rating scale for level of satisfaction on Pre-operative virtual OT tour were the tools used to collect data, after establishing validity and reliability. The main data collection was done after determining the feasibility and practicability through pilot study.

The level of anxiety was checked for both the control and experimental group before and after pre-operative virtual OT tour. The level of satisfaction on pre-operative virtual OT tour was assessed .The data was tabulated and analyzed by using descriptive and inferential statistics.

Demographic Variables of Children Undergoing Surgery

Significant percentage of children were 11-12yrs old (40%, 40%). According to the report of Anxiety Care UK (2009), children in age group 9-13 years experience separation anxiety especially during the course of illness and they fear injections and other therapeutic measures. This suggests the nurses to concentrate more on this age group to reduce their anxiety about surgery.

Among the children of both control and experimental group, majority of them belong to nuclear family (77%, 63%) respectively. The researcher felt that as the responsibility to care for other family members were less in nuclear families, it promotes the parents to seek better care for their children. A study conducted by

Rai et al (1992) says that the prevalence of anxiety and other behavior problems are higher in children in nuclear family than children from joint families. Hence it is the responsibility of nurses to give special care while preparing such children for surgery.

Majority of the children in control and experimental group were from urban area (73% ,66%) respectively. Even though the children are distributed in different areas of residence they seek good medical advice and are aware about the advantages of taking adequate medical attention.

Clinical Variables of Children Undergoing Surgery

Most of the children undergoing surgery had genitourinary problems (33%, 37%) which shows that genitourinary problems are common in the age group of 8 – 16 years. This was supported by Poalo (2005) who conducted a longitudinal study in Danish children which revealed that prevalence of genitourinary problems is increasing at a rate of 3.8 per 1000 children.

Majority of the children in the control and experimental group had previous surgeries (60%, 66%). Mary Allen et al (2001) states in her study that a child who had previously undergone surgery or has been hospitalized may develop a better emotional response to an information-based preparation program. Hence the researcher felt that preparing those children can yield better outcome than others.

Majority of them shared their worries with their mothers (80%, 70%).This was supported by Rangel (2012) in her study, that the mother was the family member who most often accompanied the pediatric patient. Thus the researcher felt the importance of preparing parents, especially mothers also for the surgery of their child.

None of the children had seen a video of surgery before (100%, 100%) which shows that they were not familiar with the various behavioral modalities which could reduce pre-operative anxiety. Hence it is the duty of the pediatric nurses to explain and prepare the child and family for surgery.

The first objective was to assess the level of anxiety in children undergoing surgery in the control and experimental group before and after pre-operative virtual OT tour

Majority of the children undergoing surgery in the control and experimental group experienced severe anxiety (90%, 90%) and some of them had the worst level of anxiety (10%,10%) before pre-operative virtual OT tour . But there was a significant difference in the experimental group, no child experienced severe or worst anxiety and majority of them had mild anxiety (60%) and the rest (40%) experienced moderate anxiety after pre-operative virtual operation theatre tour . Whereas in control group most of the children experienced severe anxiety (90%) and 10% experienced worst anxiety in the post operative period. This could be attributed to the effectiveness of pre-operative virtual operation theatre tour.

The above findings of the study supported by studies conducted by Nicola (2006) concluded that pre-operative patient education can reduce anxiety by making the unknown familiar.

Thus the researcher concluded that the worst and severe levels of anxiety can be brought to moderate to mild if appropriate measures are taken. Hence all the nurses must be trained regarding patient preparation and behavior modification modalities so that they can implement them while caring for pre-operative children.

The second objective was to assess the effectiveness of pre-operative virtual OT tour by comparing the mean and standard deviation of anxiety levels between the control and experimental group before and after pre-operative virtual OT tour

In control group there was no significant difference in the mean and standard deviation of anxiety levels (M=4.1, 4.1 & SD=0.3, 0.3) before and after pre-operative virtual Operation Theatre tour. The experimental group showed a significant difference ($p<0.001$) in the mean and standard deviation of anxiety (M=4.1, 0.3 & SD=2.4, 0.49) before and after pre-operative virtual Operation Theatre tour and it can be attributed to the effectiveness of pre-operative virtual Operation Theatre tour. Hence the null hypothesis H_{o1} was rejected.

Thus it is the responsibility of every pediatric nurse to understand the importance of pre-operative preparation using pre-operative virtual operation theatre tour.

The third objective was to assess the level of satisfaction in the experimental group of children undergoing surgery regarding pre-operative virtual OT tour

Majority of the children were highly satisfied (87%) with the pre-operative virtual Operation Theatre tour and none of them felt dissatisfied with the intervention. This interprets that pre-operative virtual Operation Theatre tour was highly effective in reducing the anxiety of children undergoing surgery. Though there are many ways to reduce the anxiety of children undergoing surgery, being familiar with the unknown through prior exposure has better effects. Thus the pediatric nurses should understand their importance and should be encouraged in practicing such methods.

The fourth objective was to find out the association between selected demographic variables and the level of anxiety in the control and experimental group before and after pre-operative virtual OT tour.

There was a significant association between selected demographic variable gender of the child and anxiety levels in the control group (χ^2=3.8,df=1) at $p<0.05$, but there was no significant association between other demographic variables and anxiety in the control and experimental groups. Hence the null hypothesis H_{o2} is rejected with regard to gender.

The fifth objective was to find out the association between selected clinical variables and the level of anxiety in the control and experimental group before and after pre-operative virtual OT tour.

No significant association was found between the clinical variables and the level of anxiety in both the control and experimental group of children undergoing surgery which emphasizes that clinical variables have no influence over the anxiety of children undergoing surgery and necessitates provision of external agent in reducing the anxiety of children undergoing surgery.

Summary

This chapter has dealt with the discussion of various aspects of the study findings, emphasized the objectives of the study, major findings of the demographic and clinical variables, comparison of the anxiety levels of children undergoing surgery before and after the pre-operative virtual OT tour in the control and experimental groups, association between selected demographic variables and clinical variables with anxiety levels of children undergoing surgery in both the groups and the level of satisfaction regarding pre-operative virtual operation theatre tour in the experimental group of children undergoing surgery.

CHAPTER VI

SUMMARY, CONCLUSION, NURSING IMPLICATIONS AND RECOMMENDATIONS

The heart of the research project lies in reporting the findings. This is the most creative and demanding part of the study. This chapter gives a brief account of the present study, suggestions of the study and the nursing implications. The present study was intended to analyze the effectiveness of pre-operative virtual operation theatre tour upon anxiety in children undergoing surgery.

Summary

An Experimental Study to Assess the Effectiveness of Pre -Operative Virtual Operation Theatre (OT) Tour upon Anxiety among Children Undergoing Surgery at Selected Hospital, Chennai**.**

Objectives of the Study

1. To assess the level of anxiety before and after pre-operative virtual OT tour in control and experimental group of children undergoing surgery.
2. To determine the effectiveness of pre-operative virtual OT tour upon the level of anxiety by comparing the level of anxiety before and after

preoperative virtual OT tour in control and experimental groups of children undergoing surgery.

3. To determine the level of satisfaction regarding preoperative virtual OT tour in children and parents of the experimental group of children undergoing surgery.

4. To find out the association between the selected demographic variables and the level of anxiety before and after pre-operative virtual OT tour in the control and experimental group of children undergoing surgery.

5. To find out the association between the selected clinical variables and the level of anxiety before and after pre-operative virtual OT tour in the control and experimental group of children undergoing surgery.

Null hypotheses

H_{01}: There will be no significant difference in the level of anxiety before and after pre-operative virtual OT tour in the control and experimental group of children undergoing surgery.

H_{02}: There will be no significant association between the selected demographic variables and the level of anxiety before and after pre-operative virtual OT tour in control and experimental group of children undergoing surgery

H_{03}: There will be no significant association between the selected clinical variables and level of anxiety before and after pre-operative virtual OT tour in control and experimental group of children undergoing surgery.

The conceptual frame work was based on Weidenbach's Helping Art of Clinical Nursing theory which was modified for the present study, and extensive review of literature and expert guidance formed the foundation of development of the research tool.

An experimental design was adopted for this study. Systematic sampling technique was used to select 30 children in the control group and 30 in the experimental group from Apollo Children's Hospital. The Facial Image Scale and rating scale for level of satisfaction on pre-operative virtual OT tour were the tools used to collect data, after establishing validity and reliability. The main data collection was done after determining the feasibility and practicability through pilot study.

Major Findings of the Study

- Majority of the children in the control and experimental groups were doing their primary education (66%, 70%), belonged to nuclear family (77%, 63%), lived in urban area (73%, 66%) with a family income >Rs.20,001(90%,77%),used to share their fears with their mothers (80%, 70%) respectively.
- In control group most of the fathers were graduates (57%) and mothers had undergone secondary education (50%) whereas in experimental group most of the parents were graduates (63%).
- Significant percentage of children in the control and the experimental groups were between the age group of 11-12yrs (40%,40%),were males(53%,50%) and belonged to the Hindu religion (47%,50%),

had genito urinary problems (33%, 37%) with illness lasting few months (37%,40%) respectively.

- All children in the control and the experimental groups had a previous history of hospitalization, had received information about surgery from their doctors (100%, 100%) and none of them had seen a video of a surgery before (100%, 100%) respectively.

- Majority of children in the control group experienced severe anxiety (90%, 90%) in pretest and post test.

- Majority of children in experimental group experienced severe anxiety (90%) before pre-operative virtual OT tour whereas after the pre-operative virtual OT tour, severe anxiety was found to be reduced to mild anxiety (60%) and moderate anxiety (40%).

- The difference in mean and standard deviation of the anxiety levels of children before pre-operative virtual OT tour (M=4.1, 4.1 & SD=0.3, 0.3) between the control and experimental groups is not statistically significant ($p<0.001$), whereas after pre-operative virtual OT tour, there is a difference in the mean and standard deviation of anxiety levels (M=4.1, 0.3 & SD=2.4, 0.49) between the control and experimental groups of children undergoing surgery. So the null hypothesis Ho_1 "There will be no significant difference in the level of anxiety before and after pre operative virtual OT tour in control and experimental group of children undergoing surgery" was rejected with regard to experimental group alone.

- Majority of the children were highly satisfied (87%) with pre-operative virtual Operation Theatre tour and none of them were dissatisfied with the intervention. This shows that pre-operative virtual Operation Theatre tour was highly effective in reducing the anxiety of children undergoing surgery.

- There was significant association between the selected demographic variable gender of the child and anxiety level in the control group (χ^2=3.8,df=1)at $p<0.05$, but there was no significant association between other demographic variables and anxiety levels in the control and experimental groups. Hence the null hypothesis Ho_2"There will be no significant association between the selected demographic variables and level of anxiety before and after pre operative virtual OT tour in control and experimental group of children undergoing surgery" was rejected with regard to gender.

- No significant association was found between the clinical variables and the level of anxiety in both the control and experimental group of children undergoing surgery . So the null hypothesis H03 "There will be no significant association between the selected clinical variables and level of anxiety before and after pre operative virtual OT tour in control and experimental group of children undergoing surgery" emphasizes that clinical variables have no influence over the anxiety of children undergoing surgery and necessitates the provision of an external agent in reducing the anxiety of children undergoing surgery.

This study demonstrated that post-operative virtual OT tour can help in reducing the anxiety of children undergoing surgery.

Conclusion

This study shows that pre-operative virtual OT tour was effective in reducing the anxiety in children undergoing surgery. The experimental group of children who had undergone pre-operative virtual OT tour were highly satisfied .Proper preparation of the child and the family for surgery has good impact on post operative recovery and has no adverse effects. Hence pediatric nurses could be encouraged to use this as a method of preparing the child for surgery.

Implications

The researcher has derived from the study the following implications which are of vital concern in the field of nursing practice, nursing education, nursing administration and nursing research.

Nursing practice

The experimental group of children undergoing surgery experienced less anxiety in the intra as well as post operative period than the control group proving that pre-operative virtual OT tour to be effective. Each child is unique and the level anxiety varies with underlying illness and developmental level. Previous exposure and knowledge about what is going to happen can reduce anxiety to an extent. Familiarizing the situation tends to decrease the fear. Hence it is necessary for the pediatric nurses to have adequate knowledge and skill about the various techniques

to reduce anxiety in children undergoing surgery. Though there are various ways of preparing the child for surgery, pre-operative virtual OT tour is safe and effective. Thus nurses should use pre-operative virtual OT tour as a safe and effective method to reduce anxiety in children undergoing surgery.

Nursing Education

With emerging health care trends, policies should be established in the nursing institutions to help students to improve their knowledge about anxiety of children undergoing surgery. Nursing curriculum should provide opportunities for students to participate in preoperative preparation of children. Special training should be given to nurses working in pediatric surgery wards and operation theatre for assessing the anxiety level and performing various interventions such as pre-operative virtual OT tour.

Nursing Administration

In today's technological advances and the ever growing challenges in field of health care, the administrator has the highest responsibility to provide the nurses with substantive continuing education opportunities on the anxiety of children undergoing surgery and nursing interventions for reducing it. This will enable the nurses to update their knowledge, acquire special skills in managing the children undergoing surgery and demonstrate high quality care.

Nurse administrators should take the initiative and periodically organize activities in their administration to reduce the anxiety of parents and children undergoing surgery. The nurse leader must be a liaison with the child and his/her parents. The nurse administrator should accept the responsibility to supervise the staff nurses so as to ensure good quality pre-operative care.

The nurse administrator should also take adequate steps with the growing bodies in formulating policies and protocols in providing patient education and plans for man power, money, material, methods and time to conduct successful and useful patient education programmes.

Nursing Research

There is a need for extensive and intensive research in this area to generate more specific data base. It opens a big avenue for research on innovative and alternative methods to reduce anxiety in children undergoing surgery. Further researches need to be conducted to help the pre-operative children to come out of their anxiety. The professional and student nurses can conduct further studies on the impact of various alternative methods for preparing the children and their families for surgery so as to generate a more scientific base on which new strategies for reducing the anxiety can be developed.

Dissemination of the findings can be done through conferences, seminars, publications in professional, national, international journals and the World Wide Web and this will benefit a wider community. More theories can be generated based on the research findings.

Recommendations

The researcher recommends the following studies in the field of nursing research

- The same study could be conducted on larger samples for better generalization.

- The study could be replicated by allocating more time for data collection.
- The study could be conducted for all invasive procedures in children.
- A similar study can be conducted comparing two or more groups like government, semi government and private hospitals.

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APPENDIX – I

LETTER SEEKING PERMISSION TO CONDUCT STUDY

Apollo College of Nursing
(Recognised by the Indian Nursing Council and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai)

CO/0236/12 ***8.06.12***

To

The Director, `
Apollo Children's Hospital
No.15,Shafeer Mohammed Road
Thousand Light
Greams Road
Chennai- 600 006

Respected Sir/ Madam,

Sub.: *To request permission for research study – Reg.*

Greetings! *As part of the curriculum requirement our 2nd year M. Sc. (N) student Ms. Jeena Joy has selected the following title for her research study.*

"An experimental study to assess the effectiveness of pre operative virtual Operation Theatre tour upon anxiety in children undergoing surgery at selected hospital, Chennai."

So I kindly request your goodselves to permit her to conduct study in your esteemed institution.

Thanking You,

Dr. LATHA VENKATESAN
PRINCIPAL

IS/ISO 9001:2000

Vanagaram to Ambattur Main Road, Ayanambakkam, Chennai - 600 095.
Ph. : 044 - 2653 4387 Tele fax : 044 - 2653 4923 / 044- 2653 4386

APPENDIX - II

LETTER PERMITTING TO CONDUCT STUDY

Apollo College of Nursing

(Recognised by the Indian Nursing Council and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai)

CO/0236/12 ***8.06.12***

To

The Director,
Apollo Children's Hospital
No.15,Shafeer Mohammed Road
Thousand Light
Greams Road
Chennai- 600 006

Respected Sir/ Madam,

Sub.: *To request permission for research study – Reg.*

Greetings! *As part of the curriculum requirement our 2nd year M. Sc. (N) student Ms. Jeena Joy has selected the following title for her research study.*

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Thanking You,

Dr. LATHA VENKATESAN
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IS/ISO 9001:2000

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Ph. : 044 - 2653 4387 Tele fax : 044 - 2653 4923 / 044- 2653 4386

APPENDIX - III

ETHICAL COMMITTEE CLEARANCE LETTER

Ethics Committee

Apollo HOSPITALS
TOUCHING LIVES

30th August 2012

To,

Ms. Jeena Joy
2nd Year M.SC (Nursing),
Department of Child Health Nursing,
Apollo College of Nursing,
Chennai.

Ref: An experimental study to assess the effectiveness of Pre-Operative virtual Operation Theatre (OT) Tour upon anxiety among children undergoing surgery at selected Hospital, Chennai.

Sub: Approval of the above referenced project and its related documents.

Dear Ms. Jeena Joy,

Ethics Committee-Apollo Hospitals has received the following document submitted by you related to the conduct of the above-referenced study.

- Project proposal.
- Participant consent form.

The Ethics Committee-Apollo Hospitals reviewed and discussed the study proposal documents submitted by you related to the conduct of the above referenced study at its meeting held on 29th August 2012.

The following Ethics Committee Members were present at the meeting held on 29th August 2012.

Name	Profession	Position in the committee
Mr. S. S. Narayanan	Ethicist	Chairman
Dr. Rema Menon	Clinician	Member Secretary
Dr. Radha Rajagopalan	Clinician	EC-Member
Dr. Krishnakumar	Clinician	EC-Member
Dr. Vijaya Kumar	Clinician	EC-Member
Dr. Clive Fernandes	Consultant Clinical Pharmacologist	Basic Medical Scientist

Apollo Hospitals Enterprise Limited
21, Greams Lane, Off Greams Road, Chennai - 600 006
Tel : 91 - 44 - 2829 3333 Extn : 6008, 91 - 44 - 2829 5465 Extn : 6639 Fax : 91 - 44 - 2829 4449
E - Mail : ecapollochennai@gmail.com

Ethics Committee

Apollo HOSPITALS
TOUCHING LIVES

Dr. Nalini Roa	Social Worker	EC-Member
Ms. N. Suseela	Retired English Teacher	Layperson
Ms. Maimoona Badsha	Lawyer	Lawyer
Dr. Paul Dilipkumar	Clinician	EC-Member
Dr. V. Balaji	Clinician	EC-Member
Dr. M. A. Raja	Consultant Medical Oncologist	EC-Member

After due ethical and scientific consideration, the Ethics Committee has approved the above presentation submitted by you.

The EC review and approval of the report is only to meet their academic requirement and will not amount to any approval of their conclusions / recommendations as conclusive, deserving adoption and implementation, in any form, in any healthcare institution.

The Ethics Committee is constituted and works as per ICH-GCP, ICMR and revised Schedule Y guidelines.

With Regards,

Date:
30/8/12

Rema Menon

Dr. Rema Menon,
Ethics Committee-Member Secretary,
Apollo Hospitals, Chennai,
Tamil Nadu, India.

Dr. REMA MENON
MEMBER SECRETARY
ETHICS COMMITTEE, APOLLO HOSPITALS
APOLLO HOSPITALS ENTERPRISE LIMITED
CHENNAI-600 006, TAMILNADU

Apollo Hospitals Enterprise Limited
21, Greams Lane, Off Greams Road, Chennai - 600 006
Tel : 91 - 44 - 2829 3333 Extn : 6008, 91 - 44 - 2829 5465 Extn : 6639 Fax : 91 - 44 - 2829 4449
E - Mail : ecapollochennai@gmail.com

APPENDIX - IV

PLAGIARISM ORIGINALITY REPORT

Plagiarism Detector - Originality Report

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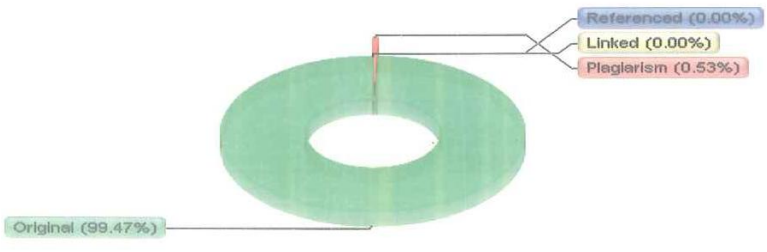

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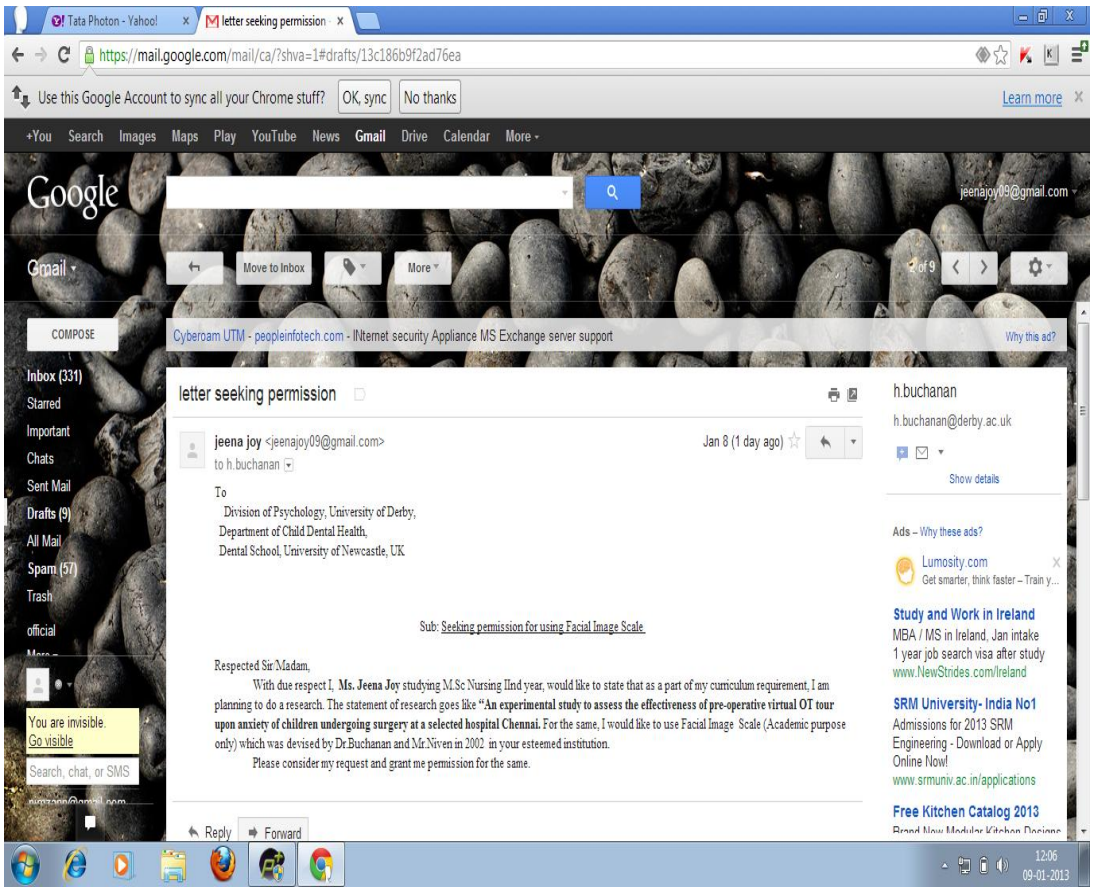
APPENDIX – V

LETTER SEEKING PERMISSION TO USE THE TOOL



letter seeking permission

jeena joy <jeenajoy09@gmail.com>
to h.buchanan

Jan 8 (1 day ago)

To
Division of Psychology, University of Derby,
Department of Child Dental Health,
Dental School, University of Newcastle, UK

Sub: Seeking permission for using Facial Image Scale

Respected Sir/Madam,

With due respect I, **Ms. Jeena Joy** studying M.Sc Nursing IInd year, would like to state that as a part of my curriculum requirement, I am planning to do a research. The statement of research goes like **"An experimental study to assess the effectiveness of pre-operative virtual OT tour upon anxiety of children undergoing surgery at a selected hospital Chennai.** For the same, I would like to use Facial Image Scale (Academic purpose only) which was devised by Dr.Buchanan and Mr.Niven in 2002 in your esteemed institution.

Please consider my request and grant me permission for the same.

APPENDIX – VI

REQUEST FOR CONTENT VALIDITY LETTER REQUESTING OPINIONS AND SUGGESTIONS OF EXPERTS FOR ESTABLISHING CONTENT VALIDITY OF RESEARCH

From

Ms. Jeena Joy,
M.Sc., (Nursing) II Year,
Apollo College of Nursing,
Chennai-95.

To

Through Proper channel
Dr. Latha Venkatesan,
Principal,
Apollo College of Nursing.

Sub: Request for opinions and suggestions of experts for content validity of Research tool.

Respected Sir/ Madam

Greetings! As a part of the Curriculum Requirement the following research title is selected for the study.

"An Experimental Study to Assess the Effectiveness of pre-operative virtual OT tour upon anxiety in children undergoing surgery in selected hospital, Chennai".

I will be highly privileged to have your valuable suggestions with regard to the establishment of Content Validity of Research tool. So, I request you to validate my Research tool and give suggestions about the tool.

Thanking You,

Yours Sincerely,

(Ms.Jeena Joy)

APPENDIX – VII

CONTENT VALIDITY CERTIFICATE

I hereby certify that I have validated the research tool and interventional programme of Ms.Jeena Joy, M.Sc (Nursing) II year student who is undertaking research study on **"An Experimental Study to Assess the Effectiveness of pre-operative virtual OT tour upon anxiety in children undergoing surgery in selected hospital , Chennai".**

Signature of Expert

Name and designation

APPENDIX - VIII

LIST OF EXPERTS FOR CONTENT VALIDITY

1. **Dr. Latha Venkatesan, M.Sc (N)., M.Phil(N)., Ph.D(N).,**
   Principal and Professor,
   Apollo college of Nursing,
   Chennai-95.

2. **Dr.(Major) R.V.Bharath**
   Assistant Medical Superintendent,
   Apollo Children's Hospital,
   Chennai

3. **Prof. Lizy Sonia, A., M.Sc. (N)., Ph.D(N).,**
   Vice Principal & Professor in Nursing,
   HOD of Medical Surgical Nursing,
   Apollo College of Nursing,
   Chennai-95.

4. **Prof. K.Vijayalakshmi,M.Sc.(N)., Ph.D(N).,M.A.Psychology**
   HOD, Department of Mental Health Nursing,
   Apollo College of Nursing, Chennai.

5. **Prof.Nesa Sathya Satchi,M.Sc(N).,**
   HOD of Child Health Nursing Dept
   Apollo College of Nursing,
   Chennai-95.

6. **Prof.G. Shobana, M.Sc(N).,**
   HOD of Community Health Nursing Dept
   Apollo College of Nursing,
   Chennai-95.

7. **Mrs. Stella Mary,I.,M.Sc.(N).,**
   Reader,
   Department of Mental Health Nursing,
   Apollo College of Nursing, Chennai.

APPENDIX - IX

RESEARCH PARTICIPANT CONSENT FORM

Dear Participant,

I am a M.Sc., Nursing student of Apollo College of Nursing, Chennai. As a part of my study, a research on **"An Experimental Study to Assess the Effectiveness of Pre-operative virtual OT Tour upon Anxiety of Children Undergoing Surgery in Selected Hospital, Chennai"** is selected to be conducted. The findings of the study will be helpful in reducing the anxiety of children undergoing surgery.

I hereby seek your consent and co-operation to participate your child in the study. Please be frank and honest in your responses. The information collected will be kept confidential and anonymity will be maintained.

Signature of the researcher

I ……. hereby consent to participate my child in the study.

Place:
Date: Signature of the Parent

APPENDIX - X

CERTIFICATE FOR ENGLISH EDITING

CERTIFICATE FOR ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the dissertation "An experimental study to assess the effectiveness of pre operative virtual OT tour upon anxiety of children undergoing surgery at a selected hospital, Chennai" by Ms. JEENA JOY, Msc.(N) II year student, Apollo College of Nursing was edited for English language appropriateness.

ALPHONSA COLLEGE DEPT. OF ENGLISH PALAI

Alice Joseph
Signature

Alice Joseph
Associate Professor
Dept. of English
Alphonsa College Pala
Kerala - 686574.

APPENDIX XI

DEMOGRAPHIC VARIABLES PROFORMA OF CHILDREN UNDERGOING SURGERY

Purpose:

This proforma is used by the researcher to measure the demographic variables of children such as age, gender, religion, education etc.

Instruction:

The investigator will collect data by interviewing the participants and with hospital records by making a tick mark to fill the details. The responses will be kept confidential and used for research purpose only.

Sample number:

Hospital number:

1. Age in years

1.1 8 – 10 ☐

1.2 10 – 12 ☐

1.3 12 – 14 ☐

1.4 14 – 16 ☐

2. Gender ☐

2.1 Male ☐

2.2 Female

3. Religion ☐

3.1 Hindu ☐

3.2 Muslim ☐

3.3 Christian ☐

3.4 Others ☐

4. Education

4.1 Not started formal education ☐

4.2 Primary ☐

4.3 Secondary ☐

5. Type of family

5.1 Nuclear ☐

5.2 Joint ☐

5.3 Any other ☐

6. Area of residence

6.1 Urban ☐

6.2 Rural ☐

6.3 Any other ☐

7. Family income per month in rupees ☐

7.1 <10,000 ☐

7.2 10,001-15,000 ☐

7.3 15,001-20,000 ☐

7.4 >20,001 ☐

8. Education of mother

8.1 Non literate ☐

8.2 Primary ☐

8.3 Secondary ☐

8.4 Higher Secondary ☐

9. Education of father ☐

9.1 Non literate ☐

9.2 Primary ☐

9.3 Secondary ☐

9,4 Higher Secondary ☐

APPENDIX XII

CLINICAL VARIABLES PROFORMA OF CHILDREN UNDERGOING SURGERY

Purpose:

This proforma is used by the researcher to measure the clinical variables of children such as duration of illness, previous hospitalization etc.

Instruction :

The investigator will collect data from hospital records and by interviewing the participants by making a tick mark to fill the details. The responses will be kept confidential and used for research purpose only.

Sample number:

Hospital number:

1. Diagnosis:

- 1.1 Gastrointestinal ☐
- 1.2 Musculoskeletal ☐
- 1.3 Neurological ☐
- 1.4 Genitourinary ☐
- 1.5 Cardiac problems ☐
- 1.6 Others: Specify ☐

2. Type of surgery ☐

- 2.1 General ☐
- 2.2 Laparoscopic ☐
- 2.3 Cardiac ☐
- 2.4 Others: Specify ☐

3. Have you ever been admitted in hospital before? ☐

- 3.1 Yes ☐
- 3.2 No ☐

4. Have you undergone any surgery before? ☐

- 4.1 Yes ☐
- 4.2 No ☐

5. Have you seen anyone (siblings, parents, relatives, friends, others) who had undergone surgery in the hospital?

5. 1 Yes ☐

5.2 No ☐

6. What is the duration of your present illness?

6.1 Few days ☐

6.2 Few weeks ☐

6.3 Few months ☐

6.4 Congenital ☐

7. How do you usually ventilate your fear?

7.1 Share with parents ☐

7.2 Share with friends ☐

7.3 Cry alone ☐

7.4 Engage in diversional activities ☐

8. To whom do you usually ventilate your fear?

8.1 Mother ☐

8.2 Father ☐

8.3 Sibling ☐

8.4 Friend ☐

8.5 Any others……..specify

9. Have you ever watched any video of a surgery before?

9.1 Yes ☐

9.2 No ☐

10. Did anybody inform you earlier about the details of surgery?

10.1 Yes ☐

10.2 No ☐

11. If yes, who informed you?

11.1 Doctor ☐

11.2 Nurse ☐

11.3 Relatives ☐

11.4 Others ☐

APPENDIX-XIII

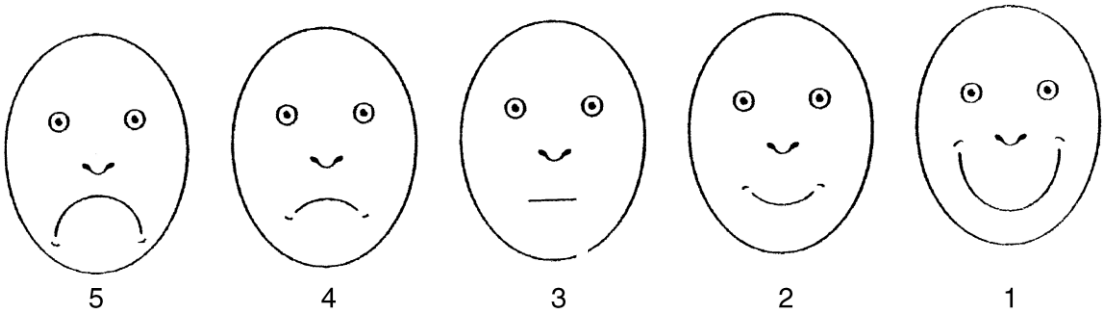
FACIAL IMAGE SCALE FOR ANXIETY

Purpose

This anxiety scale is used to measure the anxiety of children undergoing surgery before and after pre-operative virtual OT tour.

Instructions

The researcher and staff nurse observe and document the anxiety of the children undergoing surgery .Ask the child to point at a face that you most feel at this moment.



Score Interpretation

Score	Interpretation
1	No anxiety
2	Mild anxiety
3	Moderate anxiety
4	Severe anxiety
5	Worst anxiety

Sample No:

Observation Record

Level of anxiety	Pretest score	Post test score
Anxiety before virtual OT tour		
Anxiety after virtual OT tour		
Anxiety during the intra operative period (by staff nurse)		
Anxiety in the immediate post operative period		

BLUE PRINT FOR RATING SCALE TO ASSESS THE LEVEL OF SATISFACTION OF CHILDREN IN EXPERIMENTAL GROUP

Sl No	Content	Item No	Total item	Percentage
1	Characteristics of the researcher	1,2,3,4,5	5	33.3%
2	Nature of pre operative virtual OT tour	6,7,8,9,10	5	33.3%
3	Effectiveness of pre-operative virtual OT tour	11,12,13,14,15	5	33.3%

APPENDIX XIV

RATING SCALE TO ASSESS THE LEVEL OF SATISFACTION OF CHILDREN IN EXPERIMENTAL GROUP

This tool is developed by the investigator.

Purpose:

This rating scale is designed to assess the level of satisfaction of children on pre-operative virtual OT tour. This will be administered to the children in the experimental group.

Instruction:

There are 15 items given below. Each item has 4 options like strongly disagree, disagree, agree and strongly agree. Please be frank in answering and put a tick mark (√) in the space provided .The answers will be kept confidential.

Sl. No.	Item	Strongly disagree 1	Disagree 2	Agree 3	Strongly agree 4
1.	The researcher's explanation about the pre-operative virtual OT tour was adequate.				
2.	The approach of the researcher was comfortable.				
3.	The duration of time spent by the researcher was adequate.				
4.	The communication of the researcher was effective.				
5.	The session on the whole was effective.				
6.	The duration of pre-operative virtual OT tour was adequate.				
7.	The timing of pre-operative virtual OT tour was correct.				
8.	The clarity of the video was good.				

Sl. No.	Item	Strongly disagree 1	Disagree 2	Agree 3	Strongly agree 4
9.	The continuity of scenes was adequate.				
10.	The quality of the video was good.				
11.	The relief of anxiety of child after the pre-operative virtual OT tour was appreciable.				
12.	The coping abilities the child has acquired after pre-operative virtual OT tour was notable.				
13.	The attitude of the child towards surgery after pre-operative virtual OT tour was favourable				
14.	The knowledge your child gained about surgery after pre-operative virtual OT tour was adequate.				
15	The co-operation of your child with health personnel after pre-operative virtual OT tour was adequate.				

Scoring key

Strongly agree - 4

Agree - 3

Disagree - 2

Strongly disagree - 1

Score Interpretation

Scoring	Percentage	Interpretation
≥ 50	≥ 83.3%	High satisfaction
35 – 49	58.3-83.2%	Moderate satisfaction
≤ 34	≤ 58.2%	Low satisfaction

APPENDIX XV

ITEM WISE FREQUENCY AND PERCENTAGE DISTRIBUTION OF LEVEL OF SATISFACTION REGARDING PRE-OPERATIVE VIRTUAL OT TOUR IN EXPERIMENTAL GROUP OF CHILDREN UNDERGOING SURGERY

(N=30)

Items	Strongly agree		Agree		Disagree		Strongly disagree	
	n	p	n	p	n	p	n	p
1. The researcher's explanation about the pre-operative virtual OT tour was adequate.	29	96.7	1	3.3	-	-	-	-
2. Approach of the researcher was comfortable	28	93.3	2	6.7	-	-	-	-
3. The duration of time spent by the researcher was adequate	28	93.3	2	6.7	-	-	-	-
4. The communication of the researcher was effective	26	86.7	4	13.3	-	-	-	-
5. The session on the whole was effective	26	86.7	4	13.3	-	-	-	-
6. The duration of pre-operative virtual OT tour was adequate.	24	80	6	20	-	-	-	-
7. The timing of pre-operative virtual OT tour was correct.	21	70	9	30	-	-	-	-
8. The clarity of the video was good.	25	83.3	5	16.7	-	-	-	-
9. The continuity of scenes was adequate.	25	83.3	5	16.7	-	-	-	-
10. The quality of the video was good.	25	83.3	5	16.7	-	-	-	-

Items	Strongly agree		Agree		Disagree		Strongly disagree	
	n	p	n	p	n	p	n	p
11. The relief of anxiety of child after the pre-operative virtual OT tour was appreciable.	29	96.7	1	3.3	-	-	-	-
12. The coping abilities the child has acquired after pre-operative virtual OT tour was notable.	28	93.3	2	6.7	-	-	-	-
13. The attitude of the child towards surgery after pre-operative virtual OT tour was favourable	28	93.3	2	6.7	-	-	-	-
14. The knowledge your child gained about surgery after pre-operative virtual OT tour was adequate	26	86.7	4	13.3	-	-	-	-
15. The co-operation of your child with health personnel after pre-operative virtual OT tour was adequate	26	86.7	4	13.3	-	-	-	-

APPENDIX - XVI

DATA CODE SHEET
DEMOGRAPHIC VARIABLES PROFORMA

1. AGE: Age in years
- 1.1 8 – 10
- 1.2 10 – 12
- 1.3 12 – 14
- 1.4 14 – 16

2. GEN: Gender
- 2.1 Male
- 2.2 Female

3. REL: Religion
- 3.1 Hindu
- 3.2 Muslim
- 3.3 Christian
- 3.4 Others

4. EDU: Education
- 4.1 Not started formal education
- 4.2 Primary
- 4.3 Secondary

5. FAM: Type of family
- 5.1 Nuclear
- 5.2 Joint
- 5.3 Any other

6. RES: Area of residence
- 6.1 Urban
- 6.2 Rural
- 6.3 Any other

7. INC: Family income per month in rupees
- 7.1 <10,000
- 7.2 10,001-15,000
- 7.3 15,001-20,000
- 7.4 >20,001

8. EDM: Education of mother
- 8.1 Non literate
- 8.2 Primary
- 8.3 Secondary
- 8.4 Higher Secondary

9. EDF: Education of father
- 9.1 Non literate
- 9.2 Primary
- 9.3 Secondary
- 9.4 Higher Secondary

APPENDIX - XVII

DATA CODE SHEET
CLINICAL VARIABLES PROFORMA

1. DIA: Diagnosis:

1.1 Gastrointestinal

1.2 Musculoskeletal

1.3 Neurological

1.4 Genitourinary

1.5 Cardiac problems

1.6 Others: Specify

2. TYP: Type of surgery

2.1 General

2.2 Laparoscopic

2.3 Cardiac

2.4 Others: Specify

3. PRH: Have you ever been admitted in hospital before?

3.1 Yes

3.2 No

4. PRS: Have you undergone any surgery before?

4.1 Yes

4.2 No

5. EXP: Have you seen anyone who had undergone surgery in the hospital?

5. 1 Yes

5.2 No

6. DUR: What is the duration of your present illness?

6.1 Few days

6.2 Few weeks

6.3 Few months

6.4 Congenital

7. VEN: How do you usually ventilate your fear?

7.1 Share with parents

7.2 Share with friends

7.3 Cry alone

7.4 Engage in diversional activities

8. WHV: To whom do you usually ventilate your fear?

8.1 Mother

8.2 Father

8.3 Sibling

8.4 Friend

8.5 Any

9. PRV: Have you ever watched any video of surgery before?

9.1 Yes

9.2 No

10. INF: Did anybody inform you earlier about the details of surgery?

10.1 Yes

10.2 No

11. WHO: If yes, who informed you?

11.1 Doctor

11.2 Nurse

11.3 Relatives

11.4 Others

APPENDIX - XVIII

MASTER CODE SHEET

MASTER CODE SHEET											
CONTROL GROUP											
DEMOGRAPHIC VARIABLES										LEVEL OF ANXIETY	
Sl. No.	AGE	GEN	REL	EDU	FAM	RES	INC	EDF	EDM	PRETEST	POST TEST
1	1.1	2.1	3.1	4.2	5.1	6.1	7.4	8.3	9.4	4	4
2	1.2	2.1	3.2	4.2	5.1	6.1	7.4	8.4	9.5	4	4
3	1.2	2.1	3.1	4.2	5.1	6.1	7.4	8.5	9.4	4	4
4	1.2	2.2	3.1	4.2	5.1	6.1	7.4	8.3	9.5	4	4
5	1.2	2.2	3.1	4.2	5.1	6.1	7.4	8.3	9.5	4	4
6	1.3	2.1	3.2	4.3	5.1	6.1	7.4	8.3	9.4	4	4
7	1.3	2.2	3.1	4.3	5.2	6.1	7.4	8.4	9.3	5	5
8	1.2	2.1	3.3	4.2	5.2	6.2	7.4	8.3	9.5	4	4
9	1.3	2.1	3.1	4.3	5.1	6.1	7.4	8.4	9.5	4	4
10	1.4	2.2	3.1	4.2	5.1	6.2	7.4	8.5	9.5	4	4
11	1.2	2.2	3.3	4.2	5.2	6.1	7.4	8.3	9.4	4	4
12	1.4	2.2	3.3	4.3	5.1	6.1	7.4	8.4	9.4	4	4
13	1.3	2.1	3.1	4.3	5.1	6.1	7.4	8.3	9.5	4	4
14	1.1	2.1	3.2	4.2	5.1	6.2	7.4	8.4	9.5	4	4
15	1.3	2.2	3.1	4.3	5.1	6.1	7.4	8.3	9.5	5	5
16	1.4	2.1	3.3	4.3	5.1	6.1	7.4	8.3	9.4	4	4
17	1.2	2.2	3.1	4.2	5.2	6.1	7.4	8.2	9.3	4	4
18	1.2	2.1	3.2	4.2	5.1	6.2	7.4	8.3	9.4	4	4
19	1.1	2.1	3.3	4.2	5.1	6.1	7.3	8.4	9.5	4	4
20	1.3	2.1	3.3	4.3	5.2	6.2	7.4	8.3	9.5	4	4
21	1.2	2.2	3.1	4.2	5.1	6.1	7.4	8.5	9.4	4	4
22	1.2	2.2	3.1	4.2	5.2	6.1	7.4	8.3	9.5	4	4
23	1.2	2.1	3.1	4.2	5.1	6.1	7.3	8.4	9.5	4	4
24	1.1	2.2	3.2	4.2	5.2	6.2	7.4	8.3	9.4	4	4
25	1.3	2.1	3.2	4.3	5.1	6.1	7.4	8.5	9.5	4	4
26	1.1	2.2	3.1	4.2	5.1	6.1	7.4	8.3	9.4	4	4
27	1.3	2.1	3.3	4.3	5.1	6.2	7.4	8.4	9.5	4	4
28	1.1	2.2	3.3	4.2	5.1	6.1	7.4	8.4	9.4	5	5
29	1.2	2.1	3.3	4.2	5.1	6.1	7.3	8.3	9.2	4	4
30	1.4	2.2	3.2	4.2	5.1	6.2	7.4	8.5	9.5	4	4

EXPERIMENTAL GROUP												
DEMOGRAPHIC VARIABLES										LEVEL OF ANXIETY		SATISFACTION
Sl. No.	AGE	GEN	REL	EDU	FAM	RES	INC	EDM	EDF	PRETEST	POST TEST	
1	1.1	2.1	3.1	4.2	5.2	6.1	7.4	8.4	9.4	4	3	57
2	1.2	2.1	3.2	4.2	5.2	6.1	7.4	8.3	9.5	4	3	58
3	1.1	2.2	3.1	4.2	5.1	6.2	7.4	8.4	9.5	4	2	59
4	1.3	2.1	3.2	4.3	5.1	6.1	7.3	8.5	9.5	5	3	56
5	1.2	2.1	3.1	4.2	5.1	6.1	7.4	8.5	9.5	4	3	57
6	1.2	2.2	3.1	4.2	5.2	6.1	7.4	8.4	9.5	4	2	60
7	1.3	2.2	3.3	4.3	5.1	6.1	7.3	8.4	9.5	4	2	59
8	1.1	2.2	3.3	4.2	5.2	6.2	7.4	8.5	9.5	4	2	57
9	1.2	2.2	3.1	4.2	5.1	6.1	7.3	8.4	9.4	4	2	58
10	1.3	2.1	3.1	4.3	5.1	6.2	7.4	8.3	9.4	4	3	56
11	1.1	2.1	3.2	4.2	5.1	6.1	7.4	8.3	9.4	5	3	58
12	1.2	2.1	3.1	4.2	5.2	6.1	7.4	8.5	9.5	4	2	59
13	1.2	2.2	3.3	4.3	5.1	6.1	7.3	8.4	9.5	4	3	57
14	1.3	2.1	3.1	4.2	5.2	6.2	7.3	8.5	9.5	4	2	59
15	1.1	2.2	3.2	4.2	5.1	6.1	7.4	8.5	9.5	5	2	58
16	1.4	2.1	3.2	4.2	5.2	6.1	7.4	8.5	9.4	4	3	59
17	1.4	2.2	3.3	4.2	5.1	6.1	7.4	8.4	9.5	5	2	57
18	1.2	2.2	3.1	4.2	5.1	6.2	7.3	8.5	9.5	4	2	57
19	1.3	2.2	3.2	4.2	5.1	6.1	7.4	8.5	9.5	4	2	58
20	1.2	2.1	3.3	4.3	5.1	6.1	7.4	8.4	9.5	4	3	59
21	1.1	2.1	3.1	4.2	5.1	6.2	7.4	8.5	9.4	4	3	58
22	1.3	2.2	3.2	4.2	5.2	6.2	7.4	8.5	9.5	4	2	57
23	1.2	2.2	3.2	4.3	5.1	6.1	7.3	8.5	9.5	4	2	59
24	1.2	2.1	3.3	4.2	5.2	6.1	7.4	8.4	9.5	4	2	60
25	1.3	2.2	3.2	4.2	5.1	6.2	7.4	8.3	9.4	4	3	57
26	1.3	2.1	3.1	4.3	5.1	6.1	7.4	8.3	9.4	4	3	58
27	1.2	2.1	3.2	4.3	5.1	6.2	7.4	8.4	9.4	4	2	60
28	1.2	2.1	3.1	4.2	5.2	6.2	7.4	8.4	9.5	5	2	59
29	1.3	2.2	3.1	4.2	5.1	6.1	7.4	8.3	9.4	4	3	60
30	1.4	2.2	3.3	4.3	5.2	6.1	7.4	8.5	9.5	4	2	59

CONTROL GROUP											
CLINICAL VARIABLES											
Sl. No.	DIA	TYP	PRH	PRS	EXP	DUR	VEN	WHV	PRV	INH	WHO
1	1.1	2.1	3.1	4.2	5.1	6.1	7.4	8.3	9.2	10.1	11.1
2	1.2	2.3	3.2	4.2	5.1	6.1	7.4	8.4	9.2	10.1	11.1
3	1.2	2.1	3.1	4.2	5.1	6.1	7.4	8.5	9.2	10.1	11.1
4	1.2	2.2	3.1	4.2	5.1	6.1	7.4	8.3	9.2	10.1	11.1
5	1.2	2.4	3.1	4.2	5.1	6.1	7.4	8.3	9.2	10.1	11.1
6	1.3	2.1	3.2	4.1	5.1	6.1	7.4	8.3	9.2	10.1	11.1
7	1.3	2.2	3.1	4.1	5.2	6.1	7.4	8.4	9.2	10.1	11.1
8	1.2	2.1	3.1	4.2	5.2	6.2	7.4	8.3	9.2	10.1	11.1
9	1.3	2.3	3.1	4.1	5.1	6.1	7.4	8.4	9.2	10.1	11.1
10	1.4	2.2	3.1	4.2	5.1	6.2	7.4	8.5	9.2	10.1	11.1
11	1.2	2.2	3.2	4.2	5.2	6.1	7.4	8.3	9.2	10.1	11.1
12	1.4	2.2	3.2	4.1	5.1	6.1	7.4	8.4	9.2	10.1	11.1
13	1.3	2.1	3.1	4.1	5.1	6.1	7.4	8.3	9.2	10.1	11.1
14	1.1	2.4	3.2	4.2	5.1	6.2	7.4	8.4	9.2	10.1	11.1
15	1.3	2.2	3.1	4.1	5.1	6.1	7.4	8.3	9.2	10.1	11.1
16	1.4	2.1	3.1	4.1	5.1	6.1	7.4	8.3	9.2	10.1	11.1
17	1.2	2.3	3.1	4.2	5.2	6.1	7.4	8.2	9.2	10.1	11.1
18	1.2	2.1	3.2	4.2	5.1	6.2	7.4	8.3	9.2	10.1	11.1
19	1.1	2.4	3.2	4.2	5.1	6.1	7.3	8.4	9.2	10.1	11.1
20	1.3	2.1	3.2	4.1	5.2	6.2	7.4	8.3	9.2	10.1	11.1
21	1.2	2.3	3.1	4.2	5.1	6.1	7.4	8.5	9.2	10.1	11.1
22	1.2	2.4	3.1	4.2	5.2	6.1	7.4	8.3	9.2	10.1	11.1
23	1.2	2.3	3.1	4.2	5.1	6.1	7.3	8.4	9.2	10.1	11.1
24	1.1	2.4	3.2	4.2	5.2	6.2	7.4	8.3	9.2	10.1	11.1
25	1.3	2.1	3.2	4.1	5.1	6.1	7.4	8.5	9.2	10.1	11.1
26	1.1	2.3	3.1	4.2	5.1	6.1	7.4	8.3	9.2	10.1	11.1
27	1.3	2.4	3.1	4.1	5.1	6.2	7.4	8.4	9.2	10.1	11.1
28	1.1	2.2	3.2	4.2	5.1	6.1	7.4	8.4	9.2	10.1	11.1
29	1.2	2.3	3.1	4.2	5.1	6.1	7.3	8.3	9.2	10.1	11.1
30	1.4	2.4	3.2	4.2	5.1	6.2	7.4	8.5	9.2	10.1	11.1

EXPERIMENTAL GROUP											
CLINICAL VARIABLES											
Sl. No.	DIA	TYP	PRH	PRS	EXP	DUR	VEN	WHV	PRV	INH	WHO
1	1.2	2.4	3.2	4.2	5.1	6.1	7.4	8.3	9.2	10.1	11.1
2	1.2	2.3	3.2	4.2	5.1	6.1	7.4	8.4	9.2	10.1	11.1
3	1.2	2.1	3.1	4.2	5.1	6.1	7.4	8.5	9.2	10.1	11.1
4	1.2	2.2	3.1	4.2	5.1	6.2	7.4	8.3	9.2	10.1	11.1
5	1.2	2.4	3.1	4.2	5.1	6.1	7.4	8.3	9.2	10.1	11.1
6	1.3	2.1	3.2	4.1	5.1	6.1	7.4	8.3	9.2	10.1	11.1
7	1.3	2.2	3.1	4.1	5.2	6.1	7.4	8.4	9.2	10.1	11.1
8	1.2	2.1	3.1	4.2	5.2	6.2	7.4	8.3	9.2	10.1	11.1
9	1.3	2.3	3.1	4.1	5.1	6.1	7.4	8.4	9.2	10.1	11.1
10	1.4	2.2	3.1	4.2	5.1	6.2	7.4	8.5	9.2	10.1	11.1
11	1.2	2.2	3.2	4.2	5.2	6.1	7.4	8.3	9.2	10.1	11.1
12	1.4	2.2	3.2	4.1	5.1	6.1	7.4	8.4	9.2	10.1	11.1
13	1.3	2.1	3.1	4.1	5.1	6.1	7.4	8.3	9.2	10.1	11.1
14	1.1	2.4	3.2	4.2	5.1	6.2	7.4	8.4	9.2	10.1	11.1
15	1.3	2.2	3.1	4.1	5.1	6.1	7.4	8.3	9.2	10.1	11.1
16	1.4	2.1	3.1	4.1	5.1	6.1	7.4	8.3	9.2	10.1	11.1
17	1.2	2.3	3.1	4.2	5.2	6.1	7.4	8.2	9.2	10.1	11.1
18	1.2	2.1	3.2	4.2	5.1	6.2	7.4	8.3	9.2	10.1	11.1
19	1.1	2.4	3.2	4.2	5.1	6.1	7.3	8.4	9.2	10.1	11.1
20	1.3	2.1	3.2	4.1	5.2	6.2	7.4	8.3	9.2	10.1	11.1
21	1.2	2.3	3.1	4.2	5.1	6.1	7.4	8.5	9.2	10.1	11.1
22	1.2	2.4	3.1	4.2	5.2	6.1	7.4	8.3	9.2	10.1	11.1
23	1.2	2.3	3.1	4.2	5.1	6.1	7.3	8.4	9.2	10.1	11.1
24	1.1	2.4	3.2	4.2	5.2	6.2	7.4	8.3	9.2	10.1	11.1
25	1.3	2.1	3.2	4.1	5.1	6.1	7.4	8.5	9.2	10.1	11.1
26	1.1	2.3	3.1	4.2	5.1	6.1	7.4	8.3	9.2	10.1	11.1
27	1.3	2.4	3.1	4.1	5.1	6.2	7.4	8.4	9.2	10.1	11.1
28	1.1	2.2	3.2	4.2	5.1	6.1	7.4	8.4	9.2	10.1	11.1
29	1.2	2.3	3.1	4.2	5.1	6.1	7.3	8.3	9.2	10.1	11.1
30	1.4	2.4	3.2	4.2	5.1	6.2	7.4	8.5	9.2	10.1	11.1

APPENDIX – XIX

PHOTOGRAPHS DURING PRE-OPERATIVE VIRTUAL OT TOUR