

**EFFECTIVENESS OF COMPUTER ASSISTED INSTRUCTION ON
KNOWLEDGE OF THE CARE AFTER CARDIAC SURGERY IN
PICU AMONG MOTHERS OF CHILDREN UNDER 12 YEARS**

By

Neethu. S. Anandan

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

APRIL 2012

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DECLARATION

I hereby declare that the present dissertation entitled “**EFFECTIVENESS OF COMPUTER ASSISTED INSTRUCTION ON KNOWLEDGE OF THE CARE AFTER CARDIAC SURGERY IN PICU AMONG MOTHERS OF CHILDREN UNDER 12 YEARS**” is the outcome of the original research work undertaken and carried out by me, under the guidance of Prof .S. Ani Grace Kalaimathi.MSc (N), PGDNA, DQA, Ph.D Principal and Head of the Department of Child Health Nursing ,MIOT College of Nursing, Chennai. I also declare that the material of this has not formed in any way, the basis for the award of any Degree or Diploma in this University or other Universities.

Neethu .S. Anandan

IInd Year M.Sc Nursing

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ABSTRACT

A pre-experimental study to assess the effectiveness of computer assisted instruction on knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years in selected hospitals at Chennai. The conceptual framework of the study was developed on the basis of Ludwig Von Bertalanffy(1968) general system theory model. The study variable was mothers of children under 12 years of age.

An experimental research approach with pre – experimental pre and post test design was used to achieve the objectives of the study. The study was conducted in MIOT hospitals at Chennai, with a sample size of 30 mothers of children under 12 years. The samples were selected through non – probability convenient sampling technique.

The investigator used a demographic variable performa and with a structured questionnaire on knowledge of the care after cardiac surgery in PICU among mothers of children under 12 year to collect the data. The data collection tools were validated and reliability was established. The data was collected by using a self administered questionnaire method. After the pre test computer assisted instruction was administered to the mothers of children under 12 year and the post test was done after 7 days.

The demographic characteristics revealed that most of the participants were in the age group of 26-30 years. It was noted that majority of the participants 27 (90%) had moderate knowledge and 3(10%) had inadequate knowledge, in the pre test where as in the post test none of them had inadequate knowledge and majority of them gained adequate knowledge with the mean score of 86.7 %. It was also noted that there was a significant improvement in the post test mean score which were highly significant at $P < 0.001$ level which indicates the effectiveness of computer assisted instruction. There is a significant association between the demographic variables with the pre test and post test levels of knowledge.

The results indicated that the computer assisted instruction had significantly improved the level of knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years.

TABLE OF CONTENTS

| CHAPTER | CONTENTS | PAGE NO |
|------------|---|----------------|
| I | INTRODUCTION | 1 – 11 |
| | Need for the study | |
| | Statement of the problems | |
| | Objectives of the study | |
| | Operational definition | |
| | Hypothesis | |
| | Assumptions | |
| | Delimitation | |
| | Projected out come | |
| II | REVIEW OF LITERATURE | 12 - 45 |
| | Literature related to study on care after cardiac surgery in PICU. | |
| | Literature related to study on parental knowledge on PICU care. | |
| | Literature related to effectiveness of Computer Assisted Instruction. | |
| | Conceptual framework. | |
| III | RESEARCH METHODOLOGY | 46 - 53 |
| | Research approach | |
| | Research design | |

Research setting

Population

Sample

Sample size

Sampling technique

Sampling criteria

Validity

Reliability

Pilot study

Data collection procedure

Human right protection

| | | |
|-----------|---|----------------|
| IV | DATA ANALYSIS AND INTERPRETATION | 54-69 |
| V | DISCUSSION | 70-74 |
| VI | SUMMARY, CONCLUSION, LIMITATIONS, IMPLICATIONS AND RECOMMENDATIONS | 75-80 |
| | REFERENCES | 81- 84 |
| | APPENDICES | x-xliii |

LIST OF TABLES

| S.NO | TABLES | PAGE NO |
|------|---|---------|
| 1. | Distribution of sample according the demographic variables. | 55 |
| 2. | Mean and standard deviation of pre-test knowledge scores. | 58 |
| 3. | Percentage distribution of knowledge scores during pre-test | 60 |
| 4. | Mean and standard deviation of post-test knowledge scores. | 61 |
| 5. | Effectiveness of knowledge on care of children after cardiac surgery. | 65 |
| 6. | Association between selected demographic variables pre- and post-test knowledge scores of mothers of children under 12 years on care after cardiac surgery in PICU. | 67 |

LIST OF FIGURES

| S.NO | DESCRIPTION | PAGE NO. |
|-------------|--|-----------------|
| 1 | Figure based on Leldwing Von Bertalanffy General System theory (1968) | 45 |
| 2 | Distribution of demographic variables according to education of the mothers of children under 12 years | 57 |
| 3 | Percentage distribution of post-test knowledge score. | 64 |

LIST OF APPENDICES

| S.NO | DESCRIPTION | PAGE NO |
|-------------|---|-------------------|
| 1 | Letter seeking permission to conduct the study. | x |
| 2 | Informed consent form. | xi |
| 3 | Data collection tool | xii-xviii |
| 4 | Lesson plan | xix-xxxiv |
| 5 | Teaching module | xxxv-xliii |

CHAPTER I

INTRODUCTION

“Jesus said, let the little children come to me and

Do not forbid them, for of such is the kingdom of heaven”

St. Mathew 19:14

“The welfare of today’s children predict the health and welfare of the community tomorrow”

Gandhi 1967

Children are the jewels in their parents’ lives. When parents are informed that their child have congenital heart disease (CHD) even before the child is born, the joy of giving birth is often coupled with fear, guilt, sadness, shame, and blame because of the loss of the desired healthy child they had dreamed of (Cohn, 2003; Purcell, 2005). Many parents react to the initial diagnosis of their child’s CHD with a lack of acceptance or by denying that there is a problem (Canam, 2007; Lubinsky, 2005; Rosenthal, Biesecker & Biescker, 2001). Parents may also experience intense anger at the unfairness of the situation, or they may feel socially isolated and stigmatized. (Rosenthal et al., 2001).

Congenital heart disease (CHD) is a major health problem facing families in India today. It is estimated that in at least eight of every 1,000 live births or about 25,000 to 35,000 babies are born with CHD each year in India and there is almost one percent of all live-born infants, and it accounts for approximately 30% of all congenital abnormalities (American Heart Association, 2006).

Children are the image of God and they represent the future world. So the one who care for the children in illness should have that commitment and adequate knowledge as they render service to them.

Circumstances are different, health needs are different and most of all children are different. Working with present population each one should understand the remarkable responses of children with illness and appreciate the challenges and rewards they provide for the nurses who care for them.

Most of the children with congenital heart disease have normal cognitive and motor development. However some may have delayed achievement owing to hypoxia. Inactivity and parental overprotection may be a reason for the delay. The parents should be aware of the care that will be given in pediatric intensive care unit.

Heart surgery is required to be done in children to repair heart defects (known as congenital heart defects) with which a child is born and such surgeries are known as Paediatric Heart Surgeries. Apart from congenital defects these surgeries are also required to treat other heart diseases that a child would get after birth. This procedure is done for the child's well-being. Heart Defects can occur inside the heart or outside the heart in the large blood vessels. Some heart problems need a surgery right after the baby is born while for others one can safely wait for a few months or years to have surgery.

One of the highlights of our Pediatric Intensive Care Unit is the regular and detailed counseling of the parents and family of all children admitted in the PICU. On a daily basis, at a scheduled time, the Pediatric Intensivists will meet with the parent and explain the medical condition of their child / ward in simple layman's terms.

Information should be given about the current working or confirmed diagnosis of the child, along with the current medical condition, including the status of function of various vital organ systems, the results of tests from the previous day, and the plan of management: both immediate and long term in simple terms which parents can understand. This personalized attention and time given by our consultants regularly allays the fears the parents they have about their child, clarify all doubts and questions and allows them to ask questions to fully understand their child's illness and the stage of illness. Any surgical procedures, invasive procedures are also explained sometimes with the help of simple diagrams and informed written consent obtained as and when necessary by consultants and pediatricians. The nurses will be always with the patient and give them therapeutic care and constant support to the parents and children.

The development of cardiac surgery and cardiopulmonary bypass techniques had reduced the mortality rates of these surgeries to relatively low ranks. For instance, repairs of congenital heart defects are currently estimated to have 4–6% mortality rates.

Linda (2005), states that the hospitalization of a child for cardiac surgery is known to be a stressful experience for parents. However, little is known about the time course or the relationships between parental stress and the child's actual or perceived recovery. She mainly aimed to investigate pre and postoperative parental stress and to examine some of the influencing factors that induce stress during the postoperative period for children undergoing elective cardiac surgery the stress of the parents remained moderate to high throughout their children's hospitalization regardless of the severity of illness.

Approximately 1 in 5,000 CHD children will require surgical correction of their heart defect(s) (Hoffman, 1990). Each newborn with a CHD must undergo a careful evaluation for any additional defects before surgery because a heart defect may be associated with other congenital defects (VanVught, Sreeram, Schroder & Vries, 2000).

Need for the study

We live in a era often called as information age. The explosion of new knowledge is so great that keeping us up-to-date with the latest information. Knowledge of the parents varies according to their educational economic social status. In rural or remote areas the parents will not know the congenital heart disease, as the child get any problem in the birth they believe it is the sin carried from the parents. Cardiac specialized hospitals are playing major roles in treating and managing the child with Congenital Heart Disease.

Congenital heart disease is one of the most serious and most commonly occurring chronic illnesses in children (Grech & Elliott, 1998). Congenital heart disease involves structural, positional or functional abnormalities of the heart and/or related major blood vessels present at birth. It may be acyanotic or cyanotic, depending on whether non oxygenated blood is present in the systemic circulation system (Friedman, 1999; Lilly, 1998; Porth, 2002).

In the USA, CHD is the number one birth defect affecting approximately 25,000 to 30,000 children each year. At least eight of every 1,000 infants born each year display congenital heart disease, which is almost one percent of all live born infants (American Heart Association, 2006). The mortality rate of these children may

be as high as fifty percent in the first year of life, depending on the condition (NIH Guide: Paediatric Disease Clinical Research Network, 2000; Hamed & Maher, 2000). As a result, the economic strain on the health care system that results from caring for CHD children is significant (Bristow, 1995; Rossiter & Callan, 1993).

Because of the advancement of foetal imaging techniques since 1980, studies suggest that 30 to 60 percent of congenital heart defects can be discovered prenatally by foetal echocardiography Botto and Correa (2003);

Bristow (1995) and Allan (1996) indicated that the exact etiology of CHD remains elusive in most cases; however, the incidence of CHD is higher when there is an interaction between some factors in pregnant woman and genetic susceptibilities. Women at risk of having a CHD child include those with a family history of CHD, those exposed to rubella during the first three months of pregnancy, those who are over 40, those with chronic illness such as insulin-dependent diabetes, 25 those who are heavy smokers and who drink a lot of alcohol, or those exposed to drugs such as indomethacin. Also, chromosomal abnormalities (e.g., Down syndrome) are related to the increased incidence of heart defects in children (Karmer, et al., 1987; Porth, 2002; Wong, 1987). The overall occurrence of CHD in the newborn sibling of an affected child is relatively higher than in the general population. Both male and female children are affected equally (Hamed & Maher, 2000; Wong, 1987).

Thomas A Whelan (2009) states that Illness and hospitalization are stressful experiences for the child, patients and their families. The finding of the research was identified as a range of variables that can influence the extent of negative reactions of children to hospitalization and medical interventions. These include the family's

previous medical experience, the child's developmental status, the parent-child interaction, the seriousness of the illness, the severity of the medical procedure, and the coping style adopted by a child.

Further investigation of such mediating variables as mentioned above is of benefit to children and families, as it can alert health practitioners to those children (and parents) who are most at risk and, as well, enhance the effectiveness of preparatory interventions. It is recommended that the adoption of a family systems perspective in future research will further the understanding of how the child patients and their families cope with medical procedures.

Around six million people in India (2008) have coronary artery disease and five million have rheumatic heart disease. While 40% of them require cardiac surgery, there is a need for surgery to paediatric cases. Apart from the children being born with heart defects, a large number of children developed heart defect due to rheumatic disease. Around 2,500 child heart surgeries were performed every year in the country. But, the number of heart surgeries should be at least 5,000 annually considering the immediate needs of newborns. The reasons for congenital heart defect may be due to the prevalence of congenital cardiac disease was higher among the Asian population and marriages among close relatives could be one reason.

In Tamilnadu the Heart Line Hospital has completed total 500 cardiac congenital surgeries recently in 2009.

Janet E. Rennick(2008) conducted a study on Psychological outcomes in children following paediatric intensive care unit hospitalization. The findings suggest that PICU hospitalization can result in negative psychological sequelae in children,

which can manifest themselves up to one year post-discharge. While a small number of studies have attempted to identify predictors of psychological outcome, this work remains in its infancy. The importance of the child's interpretation of the illness experience in influencing subsequent behavioural and emotional responses was highlighted.

The development of cardiac surgery and cardiopulmonary bypass techniques has reduced the mortality rates of these surgeries to relatively low ranks. For instance, repairs of congenital heart defects are currently estimated to have 4–6% mortality rates. The results of heart surgery in children often are excellent. Heart surgery can reduce symptoms, improve quality of life, and increase lifespan.

At Cincinnati Children's Hospital Medical Centre, in Cincinnati at Ohio approximately 200 to 300 open-heart operations are performed each year. In the United States, approximately 20,000 paediatric open heart procedures are performed each year. These procedures are done safely in younger children. Currently nearly 25 percent of children undergoing open heart surgery are under a month of age, and nearly 70 percent are under 1 year of age.

Hala Saied (2006) conducted a study on stress, coping, social support and adjustment among families of congenital heart disease children in paediatric intensive care unit after heart surgery. Findings of this study indicate that stress due to the accumulation of intra-family strain and stressful family life events contributes to perceptions of poorer family functioning and poor communication and interaction within the family. Both fathers and mothers reported that the overall PICU experience was stressful for them and rated their parental roles and their child's behaviours and

emotions as the most stressful dimensions of their PICU experience. Parents are frightened by some of the behaviours their child displays, such as being afraid, acting or looking as if in pain, and whining, or crying.

For assessing the mothers' knowledge about post cardiac surgery care in pediatric intensive care unit, mothers need to have adequate knowledge about post cardiac surgery care in pediatric intensive care unit. Based on this extensive review of the study the investigator felt that the mothers of children under twelve years have very little knowledge about post surgery care in pediatric intensive unit. Computer assisted instruction on post cardiac surgery care in pediatric intensive care unit is the only way to bring a strong influence on mother's knowledge about post cardiac care in pediatric intensive care unit.

Statement of the problem

A pre-experimental study to assess the effectiveness of computer assisted instruction on knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years in selected hospitals at Chennai.

Objectives of the study

- To assess the existing knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years.
- To assess the effectiveness of a Computer assisted instruction on care after cardiac surgery in PICU among mothers of children under 12 years.

- To associate post-test knowledge scores on knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years with the selected demographic variables.

Operational definitions

Effectiveness

In this study it refers to the extent to which the computer assisted instruction will help in gaining parental knowledge scores on knowledge of the care given to children under 12 years in PICU after cardiac surgery

Computer Assisted Instruction

In this study it refers to the use of laptop as an aid for preparation of power point presentation with videos for a selected group of mothers on knowledge of the care given to children under 12 years in PICU after cardiac surgery.

Knowledge

In this study knowledge refers to the awareness and understanding of the care given in PICU by the mothers.

Care

In this study the care refers to the ventilator care, hygiene, transferring and positioning the child, preventing infection, blood sampling, suctioning, nutrition, exercises and psychological support to the child.

Children under 12 years

In this study it refers to the children from birth to 12 years of age who have undergone cardiac surgery.

Cardiac surgery

In this study it refers to general cardiac surgical procedure used to treat a disease of the heart or its blood vessels.

Pediatric Intensive Care Unit

In this study the Paediatric Intensive Care Unit (PICU) is a multidisciplinary unit that provides intensive care for infants and children after cardiac surgery. This will be called as PICU.

Hypothesis

H1 - There is a significant difference between the pre-test and post-test score on knowledge of the care after cardiac surgery in PICU after giving computer assisted instruction among mothers of children under 12 years

H2 - There is a significant association between knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years with selected demographic variables.

Assumptions

- Mothers whose children under 12 years in PICU after cardiac surgery may have inadequate knowledge on care after cardiac surgery in PICU of children under 12 years.
- A computer assisted instruction will help to improve the knowledge on care after cardiac surgery in PICU among mothers of children under 12 years.
- Computer assisted instruction will relieve the stress level of the mothers regarding knowledge of the care after cardiac surgery in PICU of children under 12 years.

Delimitations

- The study is delimited to those mothers who have children bellow 12 years of age underwent cardiac surgery.
- The study is delimited to mothers who speak in Tamil or English only.
- The study is delimited to mothers who are willing to participate.

Projected outcome

- The mothers will gain adequate knowledge regarding care given to the children under 12 years in PICU after cardiac surgery.
- The mothers will have reduced stress and improve coping after computer assisted instruction on care after cardiac surgery in PICU of children under 12 years.

CHAPTER II

REVIEW OF LITERATURE

The review of literature refers to the activities involved in identifying and searching for information on a topic and developing and understanding the state of knowledge on the topic. **Polit and Hungler [2004]**

Literature review was done on care after cardiac surgery by means of extensive survey, books, journal, internet and media. Research as well as non-research literatures were reviewed to burden the understanding and gain insight into the problem under study.

The review has been divided under the following headings

Section I :

Literature related to study on care after cardiac surgery in PICU

Section II :

Literature related to study on parental knowledge on PICU care

Section III :

Literature related to effectiveness of Computer Assisted Instruction

Section I: Literature related to study on care after cardiac surgery in PICU

Algra (2012) revealed that Bedside prediction rule for infections after paediatric cardiac surgery. The purpose of this study was to develop a bedside prediction rule to estimate the risk of a postoperative infection. All consecutive paediatric cardiac surgery procedures between April 2006 and May 2009 were retrospectively analysed. The primary outcome variable was any postoperative infection, as defined by the Centre of Disease Control (2008). All variables known to the clinician at the bedside at 48 hour post cardiac surgery were included in the primary analysis, and multivariable logistic regression was used to construct a prediction rule. He concluded that simple bedside prediction rule designed for use at 48 hour post cardiac surgery can discriminate between children at high and low risk for a subsequent infection.

Chechaiah (2012) discussed that Surgical intervention for congenital heart disease (CHD) can be complicated by pulmonary hypertension (PH), which increases morbidity, mortality, and medical burden. Consequently, postoperative management of PH is an important clinical consideration to improve outcomes. Inhaled nitric oxide (iNO) is a widely accepted standard of care for PH and has been studied in the context of cardiac surgery for CHD. However, large randomized, double-blind, placebo-controlled, multicenter clinical trials in paediatric patients are limited.

Czaja.A.S. (2010) conducted a study to evaluate the performance of the paediatric index of mortality for paediatric cardiac surgery patients admitted to the paediatric intensive care unit (PICU) He used retrospective cohort analysis in multi institutional PICU's. A total of 9,208 patients were identified as cardiac surgery

patients. The result revealed that the paediatric index of mortality 2 demonstrated poor performance with fair discrimination, poor calibration, and predictive ability for paediatric cardiac surgery population and thus cannot be recommended in its current form as an adequate adjustment tool for quality measurement in this patient group.

Plumpton.K.R. (2010) conducted a study to investigate associations between thyroid hormone and cortisol concentrations after cardiac surgery and postoperative intensive care course. His result reveals that infants < 3 months of age with low triiodothyronine or high cortisol concentration on PICU admission have a more complicated PICU course. Low cortisol concentration is common in the early post operative period, but is not associated with post-operative complications.

Pons Odena (2009) conducted a prospective study to report the experience with non invasive ventilation (NIV) after cardiac surgery. A total of 331 patients were admitted to the unit after cardiac surgery during this period. Of these 159 were extubated in the operating room. NIV was introduced in 29 episodes on 26 patients. Fallot's tetralogy and AVD were the most common heart disease and 65% had type II respiratory failure. The respiratory problems usually involved were acute pulmonary oedema and atelectasis. NIV is effective and safe after cardiac surgery. It has very good results in respiratory failure due to Atelectasis and pulmonary oedema. NIV failure in these patients is strongly associated with pre operative pulmonary sequelae secondary to heart disease.

Moon.J.R. (2009) has conducted a quasi experimental study to develop a nutritional programme for the post operative period for infants who had cardiac surgery and to evaluate the effect of the programme. Newly developed nutritional

program including a feeding protocol and feeding flow was provided to the study group (n=19) and usual feeding care to the control group (n=19). The effect was analysed in terms of total feed intake, total calorie intake, gastric residual volume, and frequency of diarrhoea. Study revealed significant increase level of calorie intake and feeding amount compared to the control group.

Guardia Cam (2008) conducted a study to determine the nosocomial infection (NI) rate, main risk factors and microbial spectrum in a paediatric intensive care unit (PICU) for a group of patients. A prospective study was performed including all patients admitted to the PICU after cardiac surgery between December 2003 and November 2004. NI was defined according to centres for disease control criteria, result reviewed that 16 patients occurred atleast 1 episode of NI. The NI rate was 4.9 per 100 patients per day. The most common NI was pneumonia, followed by urinary tract infection. There were no episodes of sepsis. Aggressive monitoring and supportive devices are the main risk factors for NI. Presumed NI should be diagnosed according to standard criteria before starting antibiotic therapy and treatment modified depending on culture result.

Hatherill.M. (2007) conducted a study to explore the relationship between lactate: pyruvate ratio, hyperlactataemia, metabolic acidosis, and morbidity. The result reveals that elevated lactate: pyruvate ratio was common in children with mild metabolic acidosis and low PICU mortality. Hyperlactataemia, but not elevated lactate: pyruvate ratio or metabolic acidosis, was associated with prolongation of PICU support. Routine measurement of lactate: pyruvate ratio is not wanted for children in low-moderate operative risk categories.

Cardiol Young, etal. (2009) conducted a study on impact of oral health on the quality of life of young patients with congenital cardiac disease, findings indicated that it is of paramount importance that cardiologists and their associated staff educate patients and families about oral health and other issues associated with congenital cardiac disease.

Pazvakavambwa.I.E. (2004) conducted a study to find out if the status of a patient on arrival in the intensive care unit had any bearing on the immediate ICU outcome and if there are any correctable factors. He had undergone retrospective survey where 147 surgical patients admitted to the PICU during the period of whom 77 were male and 43 were emergency surgical procedures. All patients were coming from the operating theatre. Some simple measures could be undertaken to improve immediate ICU outcome in surgical patients in a resource limited environment, such as improving the ambient temperature in OT during surgery and standardizing transportation to PICU.

Rogers (2003) conducted a study to assess the adequacy of nutrition support in critically ill infants and children and identifies barriers impeding the delivery of estimated energy requirement (EER). 42 children who were admitted to a tertiary level PICU were studied prospectively over a 6 month period. Patients staying in the PICU longer than a full 3 day and who received enteral or a combination of enteral and parenteral nutrition were eligible for inclusion. Patient in PICU received a median of 37.7 % of their EERs. This study highlights the inadequacy of nutrition support in critically ill children in the PICU. Restriction of fluid intake was the main barrier to the delivery of adequate nutrition, particularly of infants undergoing cardiac surgery.

Flori (2003) conducted a study to characterise transthoracic intracardiac catheter uses and associated morbidities in paediatric patients recovering from congenital heart defect surgery and to identify potential risk factors associated with their use. A prospective data collection and review was used in 18 bedded PICU in a tertiary care hospital. Use of transthoracic intracardiac catheters in paediatric patients is safe. Young infants and paediatric patients with thrombocytopenia or with catheters in the left atrial or pulmonary artery position have a greater need for interventions after catheter removal, warranting added precautions.

Section II: Literature related to study on parental knowledge on PICU care

Lobel (2012) revealed that weather mothers have adequate knowledge on congenital heart disease. It consists of eight subscales covering general knowledge of cardiac functioning, signs and symptoms of the child's individual CHD before and after treatment, type of individual CHD and treatment, management of CHD, surveillance of deterioration, endocarditis, and physical activity. One hundred thirty-seven mothers completed the questionnaire immediately after their children underwent CHD surgery. The questionnaire has satisfactory psychometric properties. Knowledge on most dimensions was satisfactory, but it was rather poor with respect to important subscales as endocarditis and surveillance of deterioration. He concluded that the questionnaire covers a range of relevant topics by taking the individual CHD into account. Parents have satisfactory knowledge of CHD in some areas, but knowledge about preventive behaviours turned out as rather poor. This needs to be improved in order to make parents capable to take their share of after-treatment care.

Fernandes (2011) conducted a study to assess parental knowledge regarding lifelong congenital cardiac care (LLCCC). In this multi centre study, he has administered a questionnaire to parents of children with moderate and complex CHD to assess knowledge of life long congenital cardiac care. A total of 500 parents participated; the median age of their children was 10 years (range: 2-18 years). Most parents (81%) understood that their child would need LLCCC, but only 44% recognized that their child's cardiology care should be guided by an adult congenital heart specialist in adulthood. More than half (59%) of the parents stated that their current cardiology team had never spoken to them about LLCCC, but 96% wished to learn more. Variables associated with parental LLCCC knowledge included previous discussions regarding LLCCC, underlying cardiac surgical diagnosis, and level of parental education. He concluded that substantial number of parents of children with moderate and complex CHD lack knowledge about LLCCC, but almost all of them have a desire to learn more about the care their child will need as an adult.

Craig (2011) conducted a study to evaluate knowledge transfer and perceptions using a structured handover process for the post-operative paediatric cardiac patient being admitted to intensive care. The aim is to investigate the effects of the implementation of a structured handover in the intensive care unit, including preadmission cardiac reports and operating room information. A prospective interventional study in a tertiary paediatric hospital providing both general and cardiac intensive care in the United Kingdom was undertaken in the postoperative cardiac group. Three phases of the handover, prepatient readiness, prehandover readiness, and information conveyed, were assessed as well as

attentiveness, organization of the team, and flow of information during the handover.

All three phases of the handover were significantly improved with the handover intervention. The observer scores were also significantly improved as were the perceptions of the staff following the implementation of the handover tool. There was no significant increase in the duration of the handover. Communication between the operating room and intensive care staff, regarding postoperative paediatric cardiac patients, significantly improved with the implementation of a structured handover.

Haaq.F. (2011) revealed to evaluate the knowledge of parents or guardians of children and adolescents with congenital heart disease seen at a referral centre in Rio Grande do Sul, Brazil on infective endocarditis and its prevention. The method he used was a cross-sectional study with 90 patients with congenital heart defects in regular outpatient treatment. The parents' knowledge was assessed using a specific questionnaire and other data were obtained through medical records. The result was the median age of patients was 5.6 years (3 months -14 years), being 57,7% males. The median follow-up time in service was 3.49 years (1.20-7.38). The years of formal schooling of the parents had a mean of 7.67 ± 3.25 years. According to the score previously established, the knowledge of the interviewed parents was considered satisfactory in 37.7%, regular in 33.3% and unsatisfying in 28,8%. There was significant correlation between the index of parents' knowledge and monitoring of children at service ($r=0.584$; $P=0.796$). There was no correlation between parents' education and knowledge of them ($r=0.028$; $P=0.796$). he finally concluded that the parents' knowledge about endocarditis and its prevention was inadequate, requiring greater attention to the orientations passed in consultations.

Michelson (2009) conducted a study to broaden existing knowledge of pediatric end of life decision making by exploring factors described by parents of patients in the PICU as important/influential if they were to consider withdrawing life sustaining therapies. A quantitative and qualitative analysis of semi structured 1 to 1 interview was done in 40 of 70 parents. Forty parents interviewed said they could imagine a situation in which they could consider withdrawing life sustaining therapies. Parents described a broad range of views regarding possible consideration of withdrawing life sustaining therapies for their children and what factor would influence such a decision.

Ray (2009) discussed a study on oral health status of children with congenital heart diseases and the parental awareness on maintaining good oral health and attitude towards preventive dental health measures were evaluated. A total of 170 children between the age group of 1-16 yrs belonging to both genders, with the history of congenital heart disease from Sree Chitra Tirunal Institute of Medical Science and Technology, Thiruvananthapuram and Narayana Hrudayalaya Institute of Medical Sciences, Bangalore were examined. Oral lesions and caries experience were recorded using modified WHO oral health assessment form. Oral hygiene of the children with congenital heart disease was found to be poor with tongue coating (50.6%), plaque (41.8%), calculus (35.3%), and caries (42.4%). Parental awareness on the importance of maintaining good oral hygiene, preventive dentistry, medicinal decay and its systemic effects has been found to be very poor. Dentistry should give priority to patients whose general health may be put at risk by poor dental health. Closer cooperation between Paediatrician, Paediatric Cardiologists and Paediatric Dentists could help improve dental care for these children.

Tagarro Gac (2008) conducted a study to know in depth the parental perception on potential improvements relating to end of life care in the PICU. The method used was long and probing interviews with parents of deceased children. Answers were analyzed through content analysis (Qualitative methodology). Eleven parents and/or mothers agreed to meet for an interview, they mentioned that in depth life care may be improved in the following areas like information and communication, attention to families, death and after death time, unit organization, children care during admittance and empathy from the staff. It is possible to obtain information about end of life care by asking parents. Content analysis provides with useful knowledge to face child death and providing intensive care. The main areas to improve are related with family centered care.

Agarwal.S. (2008) discussed on the determinants if a paediatric intensive care unit (PICU) daily patient goal sheet would improve communication between health care providers and decrease length of stay (LOS). The result reveals that using a PICU daily patient goal sheet can improve communication between health care providers, help nurses identify the in-charge physicians, and be helpful for patient care. By explicitly documenting patient care goals, there is enhanced clarity of patient care plans between health care providers.

Ward-Begnoche.W. (2008) conducted a study to assess the children who experience acute injury or illness severe enough to result in a paediatric intensive care unit (PICU) stay are at risk for posttraumatic stress symptoms, as are their parents. A distinction is made between injury-related traumatic events, illness-related traumatic events, and treatment-related traumatic events, all of which contribute to this risk. The

result reveals that Children hospitalized in the PICU should be monitored for posttraumatic stress disorder during and after their stay.

Robert (2007) conducted a study on knowledge on PICU care in San Francisco. Family members of all pediatric patients admitted to an intensive care of San Francisco General Hospital was screened for enrolment and recruited sequentially over a period of nine months. They determine the frequency of family members' correct responses to the survey questions about PICU care. Family member responses were compared to the chart and real-time patient observation reality. Family members have poor overall understanding of PICU patients' prognosis, resuscitation status and care, defined as prior as less than 75% correct responses to the yes/no PICU care questions.

Salim (2009) conducted a study to assess the knowledge of family members regarding ICU care before and after they were given the educational brochure. The result revealed family members deficiency in knowledge regarding the role of respiratory therapist, pulse oximetry and DNR status which improved after reading the educational booklet (82% and 97% (p value 0.02); 75% and 95% (p value 0.003); 43% and 97% (p value < 0.00001) respectively. On the follow-up questionnaire they scored above 85% consistently. 100% of family members found the educational brochure useful. Hence there was significant lack of understanding revolves around important issue of DNR, which showed improvement with education provided by the information brochure.

Lan.S.F. (2007) had done a study to investigate the essence of the experience of mothers during the decision-making process when facing their less than three-year-

old child undergoing heart surgery due to congenital heart disease (CHD). In this phenomenological study in Taiwan nine mothers were interviewed in their homes. They were invited to share their experience of family interactions and relationships while facing a decision about their child's heart surgery. The interviews were recorded and transcribed for further analysis according to Colaizzi's phenomenological methodology. He concluded that when parents face their child having CHD and plan heart surgery, the whole family is living through a stressful decision-making process. According to the results of this study, it is obvious that the caregivers and their whole families experience psychological distress, role reorganization and remodelling of family functioning.

Kendall.L. (2007) done a study to assess a novel method for assessing risk and providing advice about activity to children and young people with congenital cardiac disease and their parents this study was done by questionnaire survey in outpatient clinics at a tertiary centre dealing with congenital cardiac disease, and 6 peripheral clinics. Children or their parents completed a brief questionnaire. If this indicated a desire for help, or a serious mismatch between advised and real level of activity, they were telephoned by a physiotherapist. He concluded that there is a significant lack of knowledge about appropriate levels of activity, and a desire for further advice, in children and young people with congenital cardiac disease. A few children may be at very significant risk. These needs can be identified, and clinical risk reduced, using a brief self-completed questionnaire combined with telephone follow-up from a suitably knowledgeable physiotherapist.

Grahn.K. (2006) revealed to examine attitudes and experiences of parents whose children have complex congenital heart disease (CHD) with respect to dental health information and advice, dental care, and service and to compare the results with data from an age- and gender-matched control group without any medical problems. Each group comprised parents of 33 children; the children's mean age was 9.4 years. All the cases and the controls resided in the county of Västerbotten, northern Sweden. Data were collected with a questionnaire with 20 joint questions to both groups and four additional questions to the CHD group. He concluded that children with CHD in northern Sweden mainly receive their dental health information from a physician or a dentist, and healthy children mainly receive information from a dental hygienist indicating that children with CHD are given priority in the dental care system. Parental attitudes to reception in the dental service differed, and parents of healthy children scored the reception at the dental clinic better than parents of children with CHD. It is suggested that children with severe CHD should receive dental care in clinics for paediatric dentistry, particularly at early ages.

Cheuk.D.K. (2004) did a study to assess parents' understanding of their child's congenital heart disease in various knowledge domains and to identify significant determinants of parental knowledge. He used cross sectional questionnaire survey in tertiary paediatric cardiac centre. 156 parents of children with relatively simple congenital heart defects were recruited from the outpatient clinic of a tertiary cardiac centre over a three month period. The questionnaire comprised 10 items of knowledge under three domains: nature of heart disease and its treatment; impact of heart disease on exercise capacity; and infective endocarditis and its prevention. The frequency distribution of the parents' knowledge in the different domains was

determined. Univariate analyses and logistic regression were performed to identify significant determinants of knowledge in selected items. He concluded that parents of children with congenital heart disease have important knowledge gaps. His findings suggest that the current educational programme is inadequate and needs to be refined to promote better parental understanding of their child's heart disease, with the ultimate aim of enabling parents to impart such knowledge accurately to their children.

Studdert.D.M. (2003) conducted a study to determine the frequency, types, sources and predictors of conflict surrounding the care of PICU of patients with prolonged stay. He had undergone a prospective method in identifying conflicts by interviewing and treating physician and nurses at two stages during the patients PICU stay. The result enrolled that 110 patients based on the length of stay criterion. Clinicians identified 55 conflicts involving 51 patients in this group. Efforts to reduce and manage conflicts that arise in the care of critically ill children should be sensitive to the distinctive features of these conflicts. Knowledge of risk factors for conflict may also help to target such intervention at the patients and families who need them most.

Bulat.D.C. (2003) done a study to assess parental knowledge regarding their children's congenital heart disease, risk of bacterial endocarditis (BE) and requirement for BE prophylaxis. Parents of 65 consecutive children with heart disease, aged from two months to 16 years, were asked to complete a survey while awaiting their ambulatory appointment. He concluded that many parents are not familiar with their child's heart disease and do not understand the risks of BE or the need for BE

prophylaxis. Results of this study and several other queries published over the past 20 years point to the need for continuous education of patients and their parents by physicians, nurses and allied health care providers.

Pye (2003) focused on parental education on newborn congenital heart surgery he examined parents experience a mixture of shock, disbelief, fear, anger, and often a profound sense of sadness. In the midst of these emotions they must learn to provide for the special needs of their infant. Providing parents with the knowledge and skills to care for their infant during this stressful time requires the concerted effort of a multidisciplinary team who can provide clear, concise, and consistent communication. He concluded that parents need to learn about care of the incision, nutritional support, and how to safely administer prescribed medications. Potential complications and when to call their health care provider or seek emergency care are an important focus of teaching. Information about infant development, challenges specific to their infant, and pragmatic strategies to support normal development are of prime interest to parents.

Beeri.M. (2003) discussed on parental knowledge, views and attitudes among outpatients at a hospital in paediatric cardiology clinic. He included seventy-four families completed a questionnaire in which they described their child's condition and stated their attitude towards dental hygiene and future prenatal diagnosis. The result revealed that eighteen percent of the parents failed to describe their child's malformation correctly. We found that parental understanding of the heart defect correlated with parental education. Future prenatal diagnosis was considered by 88% of families and termination of pregnancy by 40%. Only 40% of children were aware of their heart problem. Children of parents who were ignorant about the condition

tended to lack knowledge themselves. An additional finding was that 68% of Jewish families turn to non-medical personnel for medical advice--an interesting finding not hitherto addressed. He concluded that ignorance of their child's problem did not correlate with its severity or complexity but rather with parental background: the less educated the parent, the more likely was the problem perceived incorrectly.

Smith. E.M. (2003) conducted a study to identify and describe the experience of mothers whose adoptive children are hospitalized and to compare those experiences to those of mothers whose biological children are hospitalized. A comparative descriptive design was used, the method adopted was mothers of hospitalized children (n = 33 adopted, n=19 biological) completed a slightly revised version of the parental stressor scale. Adoptive mothers perceived statistically, significantly higher level of stress related to their child's behavioral/ emotional response to hospitalization. Children who had been with their family for less time perceived the hospitalization as more stressful. Nurses need to be aware of adoptive mothers consents related to attachment issues, limited family medical history and legal rights in order to provide sensitive and effective care. In-service education programs could be designed to help teach all staff about these important issues.

Section III: Literature related to effectiveness of Computer Assisted Instruction

Sumithra.T. (2011) conducted a study to assess the effectiveness of computer assisted instruction Vs lecture method on knowledge of autism among 3rd year B.Sc nursing students at selected college, Chennai. An experimental research approach with pre-experimental design with two group's pre and post-test design was used to achieve the objectives of the study. This study was conducted for 60 students were

selected through non- probability convenient sampling technique. The data were collected by using self administered method. She revealed that there was a significant improvement in the experimental group 1 means score comparison with the experimental group 2 mean score which were highly significant at $P < 0.006$ level which indicates that the effectiveness of teaching methods. The result indicated that the teaching methods had significantly improved the level of knowledge on autism among 3rd year B Sc Nursing students.

Labarere.M. (2011) done a study to know the effectiveness of computer assisted instruction he use CD ROM based intervention about breast feeding. He conducted a pre- and post-intervention study involving four control and four intervention maternity units in France. All breastfeeding mothers in intervention units were given a CD-ROM-based program addressing various breastfeeding topics. The primary outcome was any breastfeeding at 4 weeks assessed by follow-up telephone interview. The secondary outcomes included breastfeeding duration, breastfeeding difficulties after discharge and satisfaction with the breastfeeding experience. The rates of breastfeeding at 4 weeks remained unchanged when restricting the analysis to the mothers who actually received (87.8% [173/197]) or used [88.2% (105/119)] the CD-ROM during the post-intervention period. No significant differences were found in secondary outcomes between the two study groups. A CD-ROM-based intervention for breastfeeding mothers provides no additional benefit to usual post-natal care. Further study is needed to assess the effectiveness of multimedia packages as part of more intensive multifaceted interventions.

Schroter (2011) compared computer based online interactive Diabetes Needs Assessment Tool (DNAT) versus online self-directed learning. Health professionals were randomised to a 4-month learning period and either given access to diabetes learning modules alone (control group) or DNAT plus learning modules (intervention group). Participants completed knowledge tests before and after learning (primary outcome), and surveys to assess the acceptability of the learning and changes to clinical practice (secondary outcomes). He concluded that both groups experienced a similar and significant improvement in knowledge. The learning materials were acceptable and participants incorporated the acquired knowledge into practice.

Jackson.T.H. (2011) concluded a study to see the effectiveness of web-based teaching modules versus test-enhanced learning in dental education. The purpose of the study was to evaluate the effectiveness of self-tests as a component of web-based self-instruction in protectoral orthodontics and paediatric dentistry. He recorded the frequency of access to thirty relevant teaching modules and twenty-nine relevant self-tests for 157 second- and third-year D.D.S. students during the course of our data collection. There was a statistically significant positive correlation between frequency of accessing self-tests and course performance in one course that was totally based on self-instruction with seminars and multiple-choice examination (Level IV). The data from this study suggest that increased use of web-based self-tests may be correlated with more effective learning in protectoral dental education by virtue of the testing effect and that dental students' usage of resources for learning changes significantly over the course of their education.

Steiner (2011) did a study to evaluate the effectiveness of Computer-based attention training in the schools for children with attention deficit/hyperactivity

disorder. This study examined the efficacy of 2 computer-based training systems to teach children with attention deficit/hyperactivity disorder (ADHD) to attend more effectively. A total of 41 children with ADHD from 2 middle schools were randomly assigned to receive 2 sessions a week at school of either Neuro feedback (NF) or attention training through a standard computer format (SCF), either immediately or after a 6-month wait (waitlist control group). Parents, children, and teachers completed questionnaires pre- and post intervention. He concluded that this randomized control trial provides preliminary evidence of the effectiveness of computer-based interventions for ADHD and supports the feasibility of offering them in a school setting.

Kelders.S.M. (2011) has done a study to assess the effectiveness of a computer assisted web-based intervention aimed at healthy dietary and physical activity behaviour. He investigated the users and effect of the Healthy Weight Assistant (HWA). He investigated the value of a proposed framework (including social and economic factors, condition-related factors, patient-related factors, reasons for use, and satisfaction) to predict which participants are users and which participants are nonusers. Additionally, he investigated the effectiveness of the HWA on the primary outcomes, self-reported dietary and physical activity behaviour. His design was a two-armed randomized controlled trial that compared the HWA with a waiting list control condition. A total of 150 participants were allocated to the waiting list group, and 147 participants were allocated to the intervention group. Online questionnaires were filled out before the intervention period started and after the intervention period of 12 weeks. After the intervention period, respondents in the waiting list group could use the intervention. Objective usage data was obtained from the application itself. He

concluded that respondents did not use the application as intended. From the proposed framework, a social and economic factor (age) and a condition-related factor (chronic condition) predicted usage. Moreover, users were healthier and more knowledgeable about healthy behaviour than nonusers. We found no apparent effects of the intervention, although exploratory analyses showed that choosing to use or not to use the intervention led to different outcomes.

Nosik.M.R. (2011) discussed a study on effectiveness of a multi-component computer based training package that consisted of competency based instructions, video modelling, and two forms of feedback was evaluated in terms of treatment integrity of two procedures across four staff. Treatment integrity in completing critical steps of discrete-trial and backward chaining procedures were measured using a multiple baseline design across participants, counterbalanced for procedures. All four participants reached 100% treatment integrity on at least one skill in a role play setting. Maintenance probes showed skills maintained at the same levels 6 weeks following training.

Veneri.D. (2011) did a study on role and effectiveness of computer-assisted learning in physical therapy education. The purpose of this study was to perform a systematic review of the literature pertaining to the use and effectiveness of computer-assisted learning (CAL) in physical therapy education. She concluded that CAL can effectively convey content material compared to traditional methods of instruction. CAL is largely under researched in the field of physical therapy compared to other health professions. Recommendations for future research include larger studies, broader representation of the practice field, and development of interactive programming.

Hamel.L.M. (2011) reviewed a study to examine the evidence regarding computer- or web-based interventions to increase preadolescent and adolescent physical activity. A systemic review was conducted. Fourteen randomized control trials or quasi-experimental studies were reviewed to: (1) determine the effect of computer- or web-based interventions on increasing physical activity and/or improving body mass index, weight, percent body fat or waist circumference as a result of increasing physical activity; and (2) examine if additional components associated with these interventions increased success. The result showed that Although most interventions demonstrated statistically significant increases in physical activity or positive health changes related to physical activity, findings were small or short-lived. He concluded that computer- and web-based interventions can promote physical activity among preadolescents and adolescents, particularly in schools. However, further efforts are needed to sustain positive changes.

Marks.A. (2011) conducted a study to see the Effectiveness of the computer enhanced visual learning method in teaching the society for foetal urology hydronephrosis grading system for urology trainees. The purpose is to improve resident performance of routine orchiopexy. In this study an online-based computerized tutorial was used to teach the grading of hydronephrosis using multimedia, practice cases and a grading checklist. In a crossover design trial, 29 residents and medical students were asked to grade 16 standard neonatal renal ultrasounds using the SFU grading system before and after viewing the web-based e-learning module. Primary outcome was percent improvement in grading accuracy. He finally concluded that exposure to a computer-based learning module based on the

CEVL platform improved urology residents' and medical students' correct assignment of SFU hydronephrosis grading to newborn renal ultrasounds.

Green.M.J. (2011) evaluated the effectiveness of a computer-based decision aid for teaching medical students about advance care planning. Second-year medical students at a single medical school were randomized to use a standard advance directive or a computer-based decision aid to help patients with advance care planning. Students' knowledge, skills, and satisfaction were measured by self-report; their performance was rated by patients. 121/133 (91%) of students participated. The Decision-Aid Group (n = 60) outperformed the Standard Group (n = 61) in terms of students' knowledge ($p < 0.01$), confidence in helping patients with advance care planning ($p < 0.01$), knowledge of what matters to patients ($p = 0.05$), and satisfaction with their learning experience ($p < 0.01$). Likewise, patients in the Decision Aid Group were more satisfied with the advance care planning method ($p < 0.01$) and with several aspects of student performance. Use of a computer-based decision aid may be an effective way to teach medical students how to discuss advance care planning with cancer patients.

Campos.J.H. (2011) conducted a study to compare the effectiveness of training with an airway model simulator versus computer assisted digital video disc (DVD)-based instruction in placement of double-lumen endotracheal (DLT) tubes by anaesthesiologists with limited thoracic experience. Sixty patients undergoing elective thoracic or oesophageal surgeries requiring one-lung ventilation. Twenty-seven non-thoracic anaesthesiologists were randomised to place a DLT. He concluded that both teaching methods had similar outcomes for placement of DLTs by anaesthesiologists

with limited thoracic anaesthesia experience. Both groups performed better than individuals in our prior study. Therefore, these methods should be considered when training anaesthesiologists to successfully place DLTs.

Reinhold.J. (2010) conducted a study to assess the effectiveness of a computer assisted Web-based educational module on enhancing understanding of substance abuse and drug diversion, and to assess students' abilities and confidence in applying the information. A web-based instructional module was presented to students enrolled in their second pre-professional year, and students were informed that it was part of a research study. Knowledge was tested using 10 pre- and post-module questions. Students were also presented with 5 survey questions assessing abilities related to the learning objectives. He concluded that web-based instruction is an alternative method for engaging students in course content. He found that 59% of our pilot study group worked in a pharmacy. From the success of the pilot study, the module was implemented as an extra credit assignment in a required course to provide a foundation for developing professional responsibility.

Bonnetain.E. (2010) did a study on benefits of computer screen-based simulation in learning cardiac arrest procedures. He tested the benefits of learning cardiac arrest procedures using a multimedia computer screen-based simulator in 28 Year 2 medical students. Just before the end of the traditional resuscitation course, we compared two groups. An experiment group (EG) was first asked to learn to perform the appropriate procedures in a cardiac arrest scenario (CA1) in the computer screen-based learning environment and was then tested on a high-fidelity patient simulator in another cardiac arrest simulation (CA2). While the EG was learning to perform CA1

procedures in the computer screen-based learning environment, a control group (CG) actively continued to learn cardiac arrest procedures using practical exercises in a traditional class environment. Both groups were given the same amount of practice, exercises and trials. The CG was then also tested on the high-fidelity patient simulator for CA2, after which it was asked to perform CA1 using the computer screen-based simulator. Performances with both simulators were scored on a precise 23-point scale. He concluded that Computer screen-based simulation appears to be effective in preparing learners to use high-fidelity patient simulators, which present simulations that are closer to real-life situations.

Roels.P. (2010) done a study to see two packages of adaptive computer-assisted instruction (CAIs), both offering questions and subsequent feedback, were compared in terms of amount of feedback offered, learning efficiency and appreciation. Feedback was either barely more than knowledge of result ('minimal') or consisted of a complete additional learning path ('elaborate'). The CAIs differed in the way the type of feedback given was triggered. A total of 97 Bachelor of Science students were stratified based on a pre-test before the experiment and were allocated randomly to two groups to receive either a 'programme-assessed' or a 'student-assessed' treatment. In the former, the feedback provided by the CAI (either elaborate or minimal) was completely determined by the objective correctness of the student's response. In the student-assessed treatment, elaborate feedback was provided only to students who stated explicitly that they did not know the answer. Afterwards, students completed a post-test and an appreciation questionnaire. His results demonstrate that learners achieved a significantly higher learning effectiveness in the programme-assessed treatment in which the received feedback was fully controlled by the

correctness of the answer, compared with the student-assessed treatment. In the latter, students hardly ever admitted to not knowing the answer. Therefore, student-initiated use of the tool in a student-assessed CAI requires to be improved.

Al Jasmi.F.(2010) had done a study in hunter disease e Clinic a interactive, computer-assisted, problem-based approach to independent learning about a rare genetic disease. The aim of the study is to develop interactive teaching software functioning as a virtual clinic for the management of MPS II. He concluded that the Hunter disease eClinic employs a CBT model providing the trainee with realistic clinical problems, coupled with comprehensive basic and clinical reference information by instantaneous access to an electronic textbook, the eBook. The program was rated highly by attendees at national and international presentations. It provides a potential model for use as an educational approach to other rare genetic diseases.

Bailey.J.V. (2010) did a study to determine effects of interactive computer-based interventions (ICBI) for sexual health promotion, considering cognitive, behavioural, biological and economic outcomes. Two review authors screened abstracts, applied eligibility and quality criteria and extracted data. Results of RCTs were pooled using a random-effects model with standardised mean differences (SMDs) for continuous outcomes and odds ratios (ORs) for binary outcomes. We assessed heterogeneity using the I² statistic. Separate meta-analyses were conducted by type of comparator: 1) minimal intervention such as usual practice or leaflet, 2) face-to-face intervention or 3) a different design of ICBI; and by type of outcome (cognitive, behavioural, biological outcomes). The conclusion was that ICBI are effective tools for learning about sexual health, and they also show positive effects on

self-efficacy, intention and sexual behaviour. More research is needed to establish whether ICBI can impact on biological outcomes, to understand how interventions might work, and whether they are cost-effective.

Spijkerman.R. et al (2010) conducted a study to see the effectiveness of computer assisted web-based brief alcohol intervention and added value of normative feedback in reducing underage drinking. The objective of the present study was to test, whether an online multi component brief alcohol intervention was effective in reducing alcohol use among 15- to 20-year-old binge drinkers and whether inclusion of normative feedback would increase the effectiveness of this intervention. A total of 575 online panel members (aged 15 to 20 years) who were screened as binge drinkers were randomly assigned to (1) a Web-based brief alcohol intervention without normative feedback, (2) a Web-based brief alcohol intervention with normative feedback, or (3) a control group (no intervention). Alcohol use and moderate drinking were assessed at baseline, 1 month, and 3 months after the intervention. Separate analyses were conducted for participants in the original sample (n = 575) and those who completed both post-tests (n = 278). He concluded that exposure to a Web-based brief alcohol intervention generated a decrease in weekly drinking among 15- to 20-year-old binge drinkers but did not encourage moderate drinking in the total sample. Additional analyses revealed that intervention effects were most prominent in males resulting in less weekly alcohol use and higher levels of moderate drinking among 15- to 20-year-old males over a period of 1 to 3 months.

Postel.M.G. et al (2010) have done a study to evaluate a computer assisted e-therapy program with active therapeutic involvement for problem drinkers. In an open

randomized controlled trial, Dutch-speaking problem drinkers in the general population were randomly assigned (in blocks of 8, according to a computer-generated random list) to the 3-month e-therapy program (n = 78) or the waiting list control group (n = 78). The e-therapy program consisted of a structured 2-part online treatment program in which the participant and the therapist communicated asynchronously, via the Internet only. Participants in the waiting list control group received "no-reply" email messages once every 2 weeks. The primary outcome measures were (1) the difference in the score on weekly alcohol consumption, and (2) the proportion of participants drinking under the problem drinking limit. Intention-to-treat analyses were performed using multiple imputations to deal with loss to follow-up. A dropout questionnaire was sent to anyone who did not complete the 3-month assessment. The concluded that e-therapy for problem drinking is an effective intervention that can be delivered to a large population who otherwise do not seek help for their drinking problem. Insight into reasons for dropout can help improve e-therapy programs to decrease the number of dropouts.

Trinks.A. (2010) conducted a study to evaluate a computerized alcohol intervention implemented in a Swedish emergency department (ED) with regards to the effectiveness of two different types of tailored brief feedback on patients drinking patterns and the reach of the intervention. The study was a prospective, randomized control trial of ED patients. The designated target population was the ED population aged 18-69 years who registered at the triage room before receiving care. The computerized intervention reached 41% of the target population. The long feedback was slightly more effective than the short feedback but the differences were not statistically significant.

Ryhnen.A.M. (2010) conducted a study in aiming the systematic review to analyze what kind of internet or interactive computer based patient education programs have been developed and to analyze the effectiveness of these programs in the field of breast cancer patient education. The method adopted was randomized control on clinical trials or quasi experimental study. The interventions used were described as interactive computer or multimedia programs and use of the internet. The methodological solutions of the study varied. The effects of the studies were diverse except for knowledge related issues. The results suggest a positive relationship between the internet or computer based education program use and the knowledge level of patients with breast cancer but a diverse relationship between patients participation and other outcome measures.

Gina Owens (2008) done a comparative study with LEGO therapy and the social use of language programme (SULP) were evaluated as social skills interventions for 6-11 year old with high functioning autism and Asperger Syndrome. Results showed that the LEGO therapy group improved more than the other groups on autism specific social interaction scores. Maladaptive behaviour decreased significantly more in the LEGO and SULP group compared to the control group. There was a non-significant trend for SULP and LEGO groups to improve more than the non-intervention group in communication group in communication and socialization skills.

Bussey smith.K.N. (2007) conducted a study to evaluate the effectiveness of published interactive computerized asthma patient education program (CAPEPs) that have been subjected to randomize controlled trials. 9 of 406 criterions met inclusion

criteria. 4 CAPEPs were computer games, 7 only studied children, and 4 focused on urban population. Although interactive CAPEPs may improve patient asthma knowledge and symptoms, their effect on objective clinical outcome is less consistent.

Wattana nanthakasikorn (2005) conducted to investigate the effectiveness of computer assisted instruction (CAI) about breast feeding during the early stages of labour on knowledge and breast feeding behavior in primiparous adolescent mothers. The sample composed of 50 primiparous adolescent mothers who gave birth and received antenatal care at Siriraj Hospital where the sample was selected by simple random sampling and divided into experimental and control groups, with 25 subjects in each group. The samples in the control group received only routine nursing care, whereas those in the experimental group participated in CAI about breast feeding in combination with routine nursing care. Data were collected by a Personal Data Questionnaire, the Knowledge of Breastfeeding Questionnaire and the Breastfeeding Behavior Observation form. The data obtained was then analyzed by independent samples 't'test. Furthermore, the mean knowledge of breastfeeding scores in the experimental group was higher than those who received only routine nursing care, at a statistically significant level. Finally, the mean of breastfeeding behavior scores in the experimental group was higher than those who received only routine nursing care, at a statistically significant level.

Rouse.D.P.(2005) study reveals that compared the effectiveness of three instructional intervention strategies for teaching nursing students about congenital heart disease. They are computer assisted instruction (CAI), traditional class room lecture (TCL), and the combination of CAI and TCL. The subjects were associate

degree nursing students enrolled in a pediatric nursing course at the University of Chincinnati Raymond Walters College. Differences between pre and post scores on a 20 item multiple choice test were analyzed by analysis of variance. There was a significant improvement in scores for all groups but no significant difference in improvement in scores between the CAI group and TCL group. The CAI/TCL showed significant improvement in scores compared with the other two groups. The researcher concluded that when teaching strategies are comparable, CAI is effective as TCL.

CONCEPTUAL FRAMEWORK

A concept is an abstract idea or mental image of a phenomena or reality. Conceptualization is a process of forming ideas which centralized and forms conceptual framework for the development of research design. It helps the researcher to know what data need to be collected and gives direction to an entire research design.

A conceptual framework or model is a basic structure or outline of abstract, ideas, images that represent reality. Conceptual framework is a group of mental image or concepts that are related but relation is not explicit. The conceptual framework for the study is based on general system theory.

General system theory was first introduced by Von Bertalanffy (1968). He described that general system theory is a set of interrelated parts that come together to form a whole. Each part is a necessary component required to make a complete meaningful whole.

Von Bertalanffy (1968) defines system as an organized whole until that produces an effect or a product whose interdependent component parts interact with the environment.

Open systems are those in which there is an organized whole unit that produces an effect or a product whose interdependent component part interacts with the environment.

Open system are those in which there is an exchange of energy materials and information with the environment.

They are characterized by,

- **Input** of energy into the system
- **Throughput** during which the system process changes and recognizes imparted energy.
- **Output** of energy into the environment in the form of goods, services and intellectual products.

In the present study the mothers were considered as an open system as they receive information from environment. The system uses this input to maintain homeostasis

Input

The first component of the system is input which is the information, energy and matter that enters into the system. For a system to work well input should contribute to achieve the purpose of the system. In the present study it refers to the administration of computer assisted instruction in the following aspects like general appearances of the child in PICU, ventilator care, suctioning, monitoring, nutrition, elimination needs, Infection, personal hygiene, Nutrition, exercise., blood collection, infection control, and psychological support to the child.

Throughput

It is the use of biological, physiological and socio cultural subsystem to transform the inputs. It is the action needed to accomplish the desired task. To achieve the desired task that is to assess the effectiveness on computer assisted instruction regarding and structured questionnaire regarding knowledge of the care after cardiac

surgery in PICU among mothers of children under 12 years, it is the transformation of knowledge on care after cardiac surgery in PICU.

Output

It is the return of matter, energy and information to the environment in the form of both physical and psychological behavior. Output varies widely depending on the type and purpose of the system affecting the environment. Here the output refers to the knowledge of mothers of children under 12 years regarding care after cardiac surgery in PICU. If knowledge level is found inadequate, rectification can be done by strengthening the existing knowledge through continuous monitoring which is not under the preview of this study.

Feedback

The process of communicating what is found in evaluation of the system, the feedback can be measured by the output whether the knowledge is adequate, moderately adequate, and inadequate. If the mothers of children underwent cardiac surgery gain adequate knowledge after the administration of computer assisted instruction, then the developed CAI is considered useful to update the knowledge of mothers. If the knowledge gain is inadequate it refers that the systems input and throughput has to be reevaluated which is not included in the study.

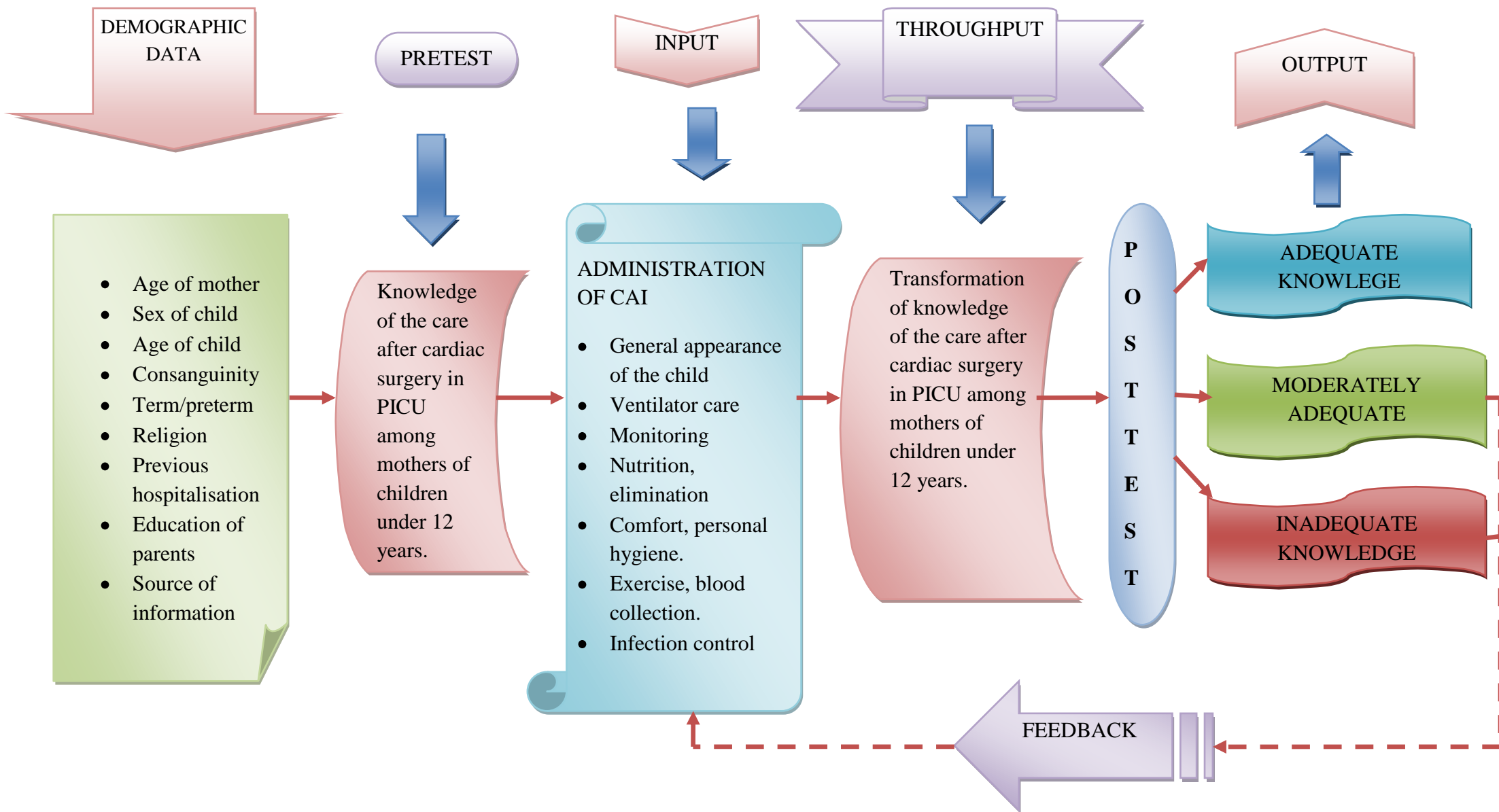


Figure 1: LELDWING VON BERTALANFFY'S GENERAL SYSTEM THEORY (1968)

CHAPTER III

METHODOLOGY

Methodology of research refers to the investigation of the ways of obtaining, organizing and analyzing data. A methodological study addresses the development in validation and evaluation of research tools and methods - (Polit, 2004)

This chapter deals with research approach, research design, setting, sample size, sampling technique, criteria for sample collection, development and description of tool, validity, reliability, pilot study, data collection procedure, data analysis and protection of human rights.

Research approach:

The research approach used for this study was quantitative approach.

Research design

A pre-experimental one group pre-test and post-test design only was used

| | | | |
|----|----------|--------------|-----------|
| | Pre-test | Intervention | Post-test |
| NR | O1 | X | O2 |

Key

NR – Non randomization

O1 – Pre-test

X – CAI on care after cardiac surgery in PICU

O2 – Post-test

Setting of the study

The study was conducted at Pediatric Intensive Care Unit in MIOT hospitals Chennai, which is a 600 bedded multispecialty hospital and has a specialized pediatric cardiology department with all facilities well equipped for monitoring the patient and excellent staff in taking care of the children. Every month 25-40 surgeries are done here.

Population

The population was all the mothers of children under 12 years of age underwent cardiac surgery.

Sample

The sample of the study comprises of mothers having children under 12 years of age who have underwent cardiac surgery in MIOT hospital, Chennai.

Sample size

The sample size was 30 mothers of children under 12 years of age who have underwent cardiac surgery.

Sampling technique

Sampling technique used for this study was non-probability convenient sampling technique.

Sampling criteria

Inclusion criteria

- Mothers who have children below 12 years of age underwent cardiac surgery.
- Mothers who speak Tamil or English.
- Mothers of children having both male and female child

Exclusion criteria

- Mothers who cannot speak Tamil or English.
- Mothers who are not willing to participate
- Mothers of children who have undergone previous cardiac surgeries.

Data collection tool

Section I-Demographic data

The demographic data includes

- Age of the parents, age of the child, sex of the child, number of hospitalization, religion, previous hospitalization, family history, education of mother, source of information.

Section II-Knowledge on care of child in PICU

- General appearances of the child in PICU, ventilator care, suctioning, monitoring, nutrition, elimination, Infection, personal hygiene, Nutrition, exercise., blood collection, infection control, and psychological support.

CAI

- Computer Assisted Instruction is a technique used to teach the mothers on care after cardiac surgery in PICU to mothers of children under 12 years. It consists of information regarding the basic care given to the children in PICU after cardiac surgery. It is in the form of power point presentation with videos.

Blue print of the tool

| S. no. | Content | Items | Total questions |
|--------|---|-------------|-----------------|
| 1. | General appearance of the child in PICU | 1,2 | 2 |
| 2. | Ventilator care | 3,4,5 | 3 |
| 3. | Suctioning | 6,7,8 | 3 |
| 4. | Monitoring | 9,10 | 2 |
| 5. | Nutrition | 11,12,13,14 | 4 |
| 6. | Elimination | 15 | 1 |
| 7. | Pain relief measures | 16,17 | 2 |
| 8. | Safety | 18 | 1 |
| 9. | Personal hygiene | 19,20,21 | 3 |
| 10. | Exercises | 22,23,24 | 3 |
| 11. | Blood collection | 24 | 1 |
| 12. | Infection control | 26,27 | 2 |
| 13. | Psychological support | 28,29,30 | 3 |

Scoring procedure

A questionnaire consisted of 30 questions and a score of one mark given for a correct response, 0 mark given for each incorrect response

Scoring and interpretation

Adequate knowledge - >75%

Moderate knowledge - 50-75%

Inadequate knowledge - <50%

Validity

The tool was developed through review of literature for content validity; the instrument was reviewed by experts in the area of the study.

Reliability

The reliability of the tool was established through pilot study. The reliability was tested by test retest method, the score was $r = 0.8$

Pilot study

The pilot study was conducted on a sample of 4 mothers of children under 12 years on knowledge of post cardiac surgery care in PICU .The result proved that the tool is valid and reliable. These mothers were then excluded from the main study.

Data collection procedure

A formal permission was obtained from the management, Senior Chief Pediatric Cardiac Surgeon, Head of the Department of PICU (cardiac ward) and the Nursing Superintendent for conducting the study. The data collection was preceded for six weeks from 30.5.2011 to 9.7.2011. As per the inclusion criteria, 30 mothers of under 12 years children were selected in pediatric cardiac ward who underwent cardiac surgery. A time plan was scheduled for the data collection period. The list of children undergoing cardiac surgery was verified from the staff nurse after which the data was collected. Each day either one or two mothers were selected and an informed consent was obtained from the mothers after briefly explaining about the study. Then the base line demographic variables were gathered, after which the pre-test regarding structured self administered questionnaire on knowledge on care after cardiac surgery in PICU was assessed. The time taken to complete the pre-test for each mother was approximately 30 minutes to one hour. On the same day the computer assisted instruction regarding care after cardiac surgery was given to mothers which took approximately 30 minutes. After a week the mothers were given the post-test regarding care after cardiac surgery in PICU. This data collection procedure was carried out in this similar pattern for each of the mothers. The data collection was done as per the following schedule:

| Number of samples | Pre-test | Post-test |
|--------------------------|-----------------|------------------|
| 1 | 30.5.2011 | 6.6.2011 |
| 1 | 31.5.2011 | 7.5.2011 |

| | | |
|---|-----------|-----------|
| 1 | 1.6.2011 | 8.5.2011 |
| 1 | 2.6.2011 | 9.5.2011 |
| 1 | 3.6.2011 | 10.5.2011 |
| 1 | 4.6.2011 | 11.5.2011 |
| 1 | 6.6.2011 | 13.5.2011 |
| 1 | 7.6.2011 | 14.6.2011 |
| 1 | 8.6.2011 | 15.6.2011 |
| 1 | 9.6.2011 | 16.6.2011 |
| 1 | 10.6.2011 | 17.6.2011 |
| 1 | 11.6.2011 | 18.6.2011 |
| 1 | 13.6.2011 | 20.6.2011 |
| 1 | 14.6.2011 | 21.6.2011 |
| 1 | 15.6.2011 | 22.6.2011 |
| 1 | 16.6.2011 | 23.6.2011 |
| 1 | 17.6.2011 | 24.6.2011 |
| 1 | 18.6.2011 | 25.6.2011 |
| 1 | 20.6.2011 | 27.6.2011 |
| 1 | 21.6.2011 | 28.6.2011 |
| 1 | 22.6.2011 | 29.6.2011 |
| 1 | 23.6.2011 | 30.6.2011 |
| 1 | 24.6.2011 | 31.6.2011 |
| 1 | 25.6.2011 | 1.7.2011 |
| 1 | 27.6.2011 | 2.6.2011 |
| 1 | 28.6.2011 | 4.7.2011 |
| 1 | 29.6.2011 | 5.7.2011 |
| 1 | 30.6.2011 | 6.7.2011 |
| 1 | 31.6.2011 | 7.7.2011 |
| 1 | 1.7.2011 | 8.7.2011 |

Human rights protection

The pilot and main study were conducted only after approval of the research proposal by the College of Nursing and the researcher's Institutional ethical committee. Also permission was obtained from the concerned Head of the Departments to conduct the study. Consent was obtained from all the subjects who participated in the study.

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

Analysis is defined as the method of organizing data in such a way that the research questions can be answered. Interpretation is the process of making sense of the results and of examining the simplification of the findings within a broader context.

-Polit & Beck, 2004

This chapter deals with analysis and interpretation of the findings. The data's were collected from mothers of children under 12 years to assess their knowledge of the care after cardiac surgery in PICU. The aim of the study was to determine the effectiveness of computer assisted instruction on knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years.

Organization of findings

The study findings are presented in the following sections.

- Section I : Distribution of sample according to the demographic characteristics.
- Section II : Percentage distributions of knowledge mean score on pre-test and post- test.
- Section III : Effectiveness of CAI on knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years.
- Section IV : Association between Demographic Variables and the post test Knowledge score.

Section –I

This section deals with the description of demographic variables of mothers of children under 12 years after cardiac surgery in PICU.

Table 1: Distribution of sample according to their Demographic characteristics.

n=30

| Demographic Variables | Frequency | Percentage |
|---|------------------|-------------------|
| 1. Age of Mother | | |
| a) < 25 years | 2 | 6.7 |
| b) 26 – 35 yrs | 18 | 60.0 |
| c) > 36 years | 10 | 33.3 |
| 2. Age of the Child | | |
| a) 1 day – 3 years | 22 | 73.3 |
| b) 4 – 8 years | 4 | 13.3 |
| c) 9 – 12 years | 4 | 13.3 |
| 3. Sex of the Child | | |
| a) Male | 16 | 53.3 |
| b) Female | 14 | 46.7 |
| 4. Type of Marriage | | |
| a) Consanguineous | 9 | 30.0 |
| b) Non Consanguineous | 21 | 70.0 |
| 5. Is your Child | | |
| a) Term | 26 | 86.7 |
| b) Pre term | 4 | 13.3 |
| 6. Religion | | |
| a) Christian | 9 | 30.0 |
| b) Muslim | 9 | 30.0 |
| c) Hindu | 12 | 40.0 |
| 7. Family history of cardiac disease | | |
| a) yes | 4 | 13.3 |
| b) no | 26 | 86.7 |
| 8. History of previous hospitalization | | |
| a) yes | 15 | 50.0 |
| b) no | 15 | 50.0 |

9. Education of mother

| | | |
|---------------|----|------|
| a) Illiterate | 2 | 6.7 |
| b) Primary | 5 | 16.7 |
| c) Secondary | 10 | 33.3 |
| d) Graduate | 13 | 43.3 |

10. Source of information

| | | |
|-------------------------------------|----|------|
| a) Magazines | 0 | 0.0 |
| b) Health professionals | 22 | 73.3 |
| c) Internet | 2 | 6.7 |
| d) Health professionals. & internet | 6 | 20.0 |

Table 1 reveals that 18(60%) of the mothers belong to the age group of 26-35 years, 22(73.3%) of the mothers had children at the age of 1 day to 3 years. Out of 30 mothers, 9(30%) of them were consanguineously married and only 4(13.3%) had a family history of congenital heart disease. Four (13.3%) of the infants were pre-term during birth which is found to be one of the causes for development of congenital heart disease and 15(50%) of them had a history of previous hospitalization. The study reveals that 22(73.3%) of them got information from the health professionals, out of which majority of the mothers were found to be graduates, that is 13(43.3%).

Figure 2

Percentage distribution of the mothers of children under 12 years according to their education.

n=30

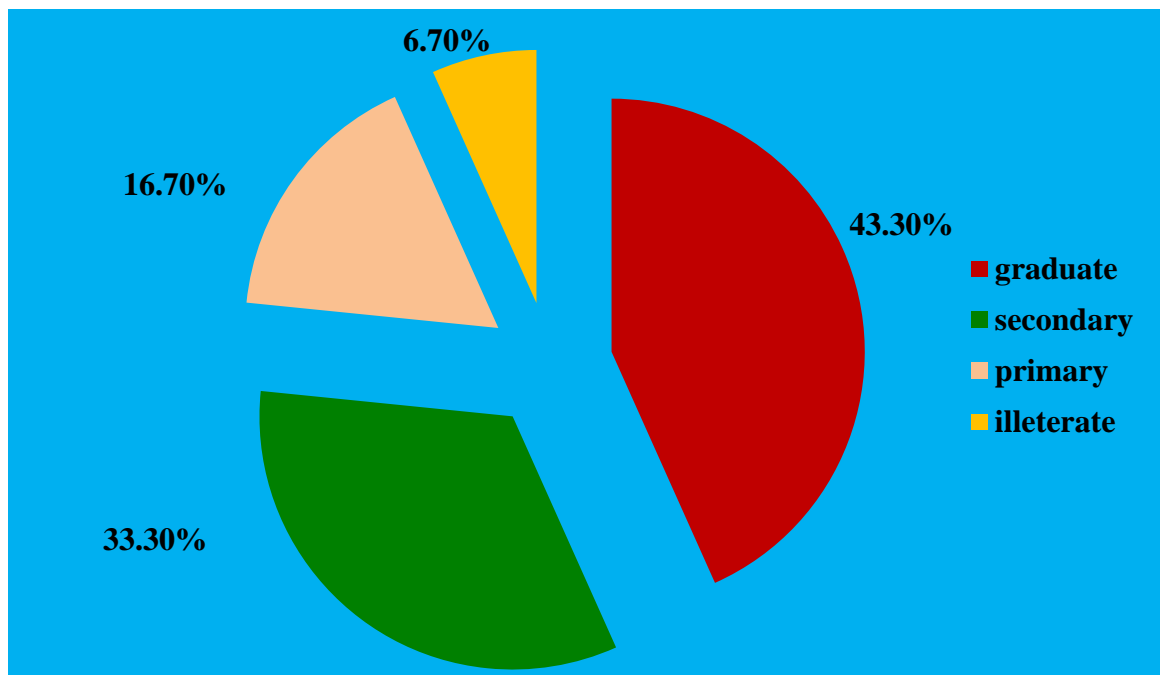


Figure 2 reveals that 43.3% mothers of children under 12 years are graduate, 33.3% mothers are secondary educators, 16.7% of the mothers are primary educators and 6.7% are illiterate.

Section – II

This section deals with percentage distribution of knowledge mean score on pre-test and post-test.

Table 2 Mean and standard deviation of pre-test knowledge score

| Knowledge Aspects | Mean | S.D. | n=30 | |
|--------------------------------|-------------|-------------|----------------|----------------|
| | | | Range | |
| | | | Minimum | Maximum |
| General appearance | 70.0 | 31.1 | 0 | 100.0 |
| Ventilator Care | 50.0 | 24.4 | 0 | 100.0 |
| Suctioning | 50.0 | 24.4 | 0 | 100.0 |
| Monitoring | 75.0 | 25.4 | 50.0 | 100.0 |
| Nutrition | 53.3 | 22.5 | 25.0 | 100.0 |
| Elimination | 93.3 | 25.4 | 0 | 100.0 |
| Comfort – Pain relief measures | 85.0 | 26.7 | 0 | 100.0 |
| Safety | 56.7 | 50.4 | 0 | 100.0 |
| Personal Hygiene | 53.3 | 27.1 | 0 | 100.0 |
| Exercises | 46.7 | 27.1 | 0 | 100.0 |
| Blood Collection | 30.0 | 46.6 | 0 | 100.0 |
| Infection Control | 86.7 | 22.5 | 50.0 | 100.0 |
| Psychological Support | 50.0 | 25.9 | 0 | 100.0 |
| Overall Knowledge | 59.2 | 8.9 | 40.0 | 73.3 |

The above table reveals that the overall mean score was 59.2%. The mothers of children under 12 years had adequate knowledge on the following aspects like elimination needs with a mean score of 93.3%, pain relief measures with a mean score of 85%, and in the knowledge of infection control a score of 86.7%. The other categories like general appearance, ventilator care, suctioning, monitoring, nutrition, safety personal hygiene, exercise, blood collection, psychological support had moderate knowledge. These results imply that they need education on care after cardiac surgery in PICU.

Table 3: Percentage distribution of knowledge scores during pre-test**n=30**

| Knowledge aspects | Inadequate knowledge | | Moderately adequate knowledge | | Adequate knowledge | |
|--------------------------------|----------------------|-------------|-------------------------------|-------------|--------------------|------------|
| | No. | % | No. | % | No. | % |
| General appearance | 2 | 6.7 | 14 | 46.7 | 14 | 46.7 |
| Ventilator Care | 17 | 56.7 | 10 | 33.3 | 3 | 10.0 |
| Suctioning | 15 | 50.0 | 13 | 43.3 | 2 | 6.7 |
| Monitoring | 0 | 0.0 | 15 | 50.0 | 15 | 50.0 |
| Nutrition | 8 | 26.7 | 20 | 66.7 | 2 | 6.7 |
| Elimination | 2 | 6.7 | 0 | 0.0 | 28 | 93.3 |
| Comfort – Pain relief measures | 1 | 3.3 | 7 | 23.3 | 22 | 73.3 |
| Safety | 13 | 43.3 | 0 | 0.0 | 17 | 56.7 |
| Personal Hygiene | 10 | 33.3 | 18 | 60.0 | 2 | 6.7 |
| Exercises | 18 | 60.0 | 9 | 30.0 | 3 | 10.0 |
| Blood Collection | 21 | 70.0 | 0 | 0.0 | 9 | 30.0 |
| Infection Control | 0 | 0.0 | 8 | 26.7 | 22 | 73.3 |
| Psychological Support | 16 | 53.3 | 11 | 36.7 | 3 | 10.0 |
| Overall Knowledge | 3 | 10.0 | 27 | 90.0 | 0 | 0.0 |

The above table shows that in pre-test knowledge score, most of the mothers had moderate knowledge 27(90 %) and few of the samples had inadequate knowledge 3(10.0%) regarding care after cardiac surgery in PICU. This implies that they need education on care after cardiac surgery in PICU.

Table 4: Mean and standard deviation of post-test knowledge scores

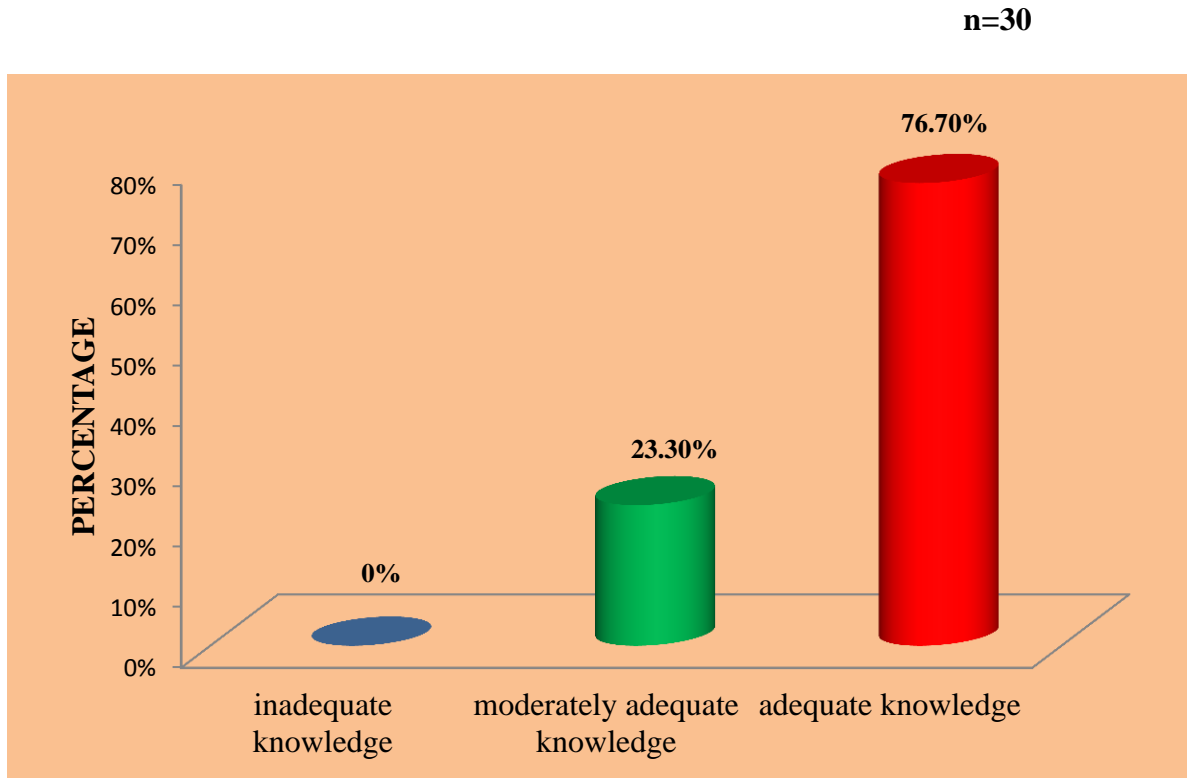
| Knowledge Aspects | Mean | S.D. | n=30 Range | |
|-----------------------------------|-------|-------|---------------|---------|
| | | | Minimum | Maximum |
| General appearance | 96.7 | 12.7 | 50.0 | 100.0 |
| Ventilator Care | 66.67 | 21.4 | 33.3 | 100.0 |
| Suctioning | 66.78 | 28.3 | 0 | 100.0 |
| Monitoring | 95.0 | 15.2 | 50.0 | 100.0 |
| Nutrition | 69.17 | 16.9 | 50.0 | 100.0 |
| Elimination | 100.0 | 0.0 | 100 | 100.0 |
| Comfort – Pain relief measures | 96.67 | 12.68 | 50 | 100.0 |
| Safety | 100.0 | 0.0 | 100.0 | 100.0 |

| | | | | |
|--------------------------|--------------|-------------|--------------|--------------|
| Personal Hygiene | 72.22 | 12.63 | 66.67 | 100.0 |
| Exercises | 65.56 | 22.3 | 33.3 | 100.0 |
| Blood Collection | 96.67 | 18.2 | 0 | 100.0 |
| Infection Control | 95.00 | 15.3 | 50.0 | 100.0 |
| Psychological Support | 74.4 | 20.8 | 33.3 | 100.0 |
| Overall Knowledge | 86.67 | 6.16 | 73.33 | 96.67 |

The above table shows that Post-test mean score is 86.67 on knowledge of mothers of children under 12 years. They have adequate knowledge on the following categories like general appearance, ventilator care, suctioning, monitoring, nutrition, elimination needs, pain relief measures, safety personal hygiene, exercise, blood collection, infection control, psychological support. This result implies that there is increase in level of knowledge on care after cardiac surgery in PICU among mothers of children under 12 years after CAI.

Figure 3

Percentage distribution of Knowledge scores on care after cardiac surgery in PICU among mothers of children under 12 years in the Post-Test



The figure 3 on post-test knowledge score shows that, mothers of children under 12 years had 76.7% adequate knowledge and 23.3% had moderate knowledge. None of them had inadequate knowledge in post test. This implies that mothers of children under 12 years had shown improvement in gaining the knowledge after CAI.

Section III

This section deals with the distribution of effectiveness of knowledge among mothers of children under 12 years of age about care after cardiac surgery in PICU.

Table 5 Effectiveness of Knowledge on care after cardiac surgery in PICU among mothers of children under 12 years n=30

| Knowledge Aspects | Improvement knowledge score | | Paired t-test & P value |
|--------------------|-----------------------------|-------|---------------------------|
| | Mean | S.D. | |
| General appearance | 26.67 | 31.44 | t= 4.646 P=0.000*** |
| Ventilator Care | 16.67 | 28.70 | t= 2.443 P=0.021* |
| Suctioning | 17.78 | 34.72 | t=2.475 P=0.019 * |
| Monitoring | 20.00 | 33.73 | t=3.247 P=0.003 ** |
| Nutrition | 15.83 | 23.19 | t= 3.275 P=0.003 ** |
| Elimination | 6.67 | 25.37 | t= 1.439 P=0.255 (N.S) |

| | | | |
|--------------------------------|--------------|-------------|--------------------------------------|
| Comfort – Pain relief measures | 11.66 | 25.20 | t= 2.536 P=0.010 ** |
| Safety | 43.33 | 50.40 | t= 4.397 P=0.000 *** |
| Personal Hygiene | 18.89 | 29.92 | t= 2.716 P=0.01 ** |
| Exercises | 18.89 | 31.18 | t= 3.117 P=0.004 ** |
| Blood Collection | 66.67 | 47.95 | t=5.461 P=0.000 *** |
| Infection Control | 8.33 | 24.60 | t= 2.023 P=0.048 * |
| Psychological Support | 24.44 | 27.58 | t=4.853 P=0.000*** |
| Overall Knowledge | 26.89 | 9.38 | t=15.692 P=0.000*** |

*** P<0.001 highly significant

The above table shows that the participants have obtained a higher knowledge, so CAI program is effective in improving knowledge on care after cardiac surgery in PICU among mothers of children under 12 years. It is proved by the obtained t value of t= 15.69 which is significant at p=0.000. Since the calculated value is greater than the table value, research hypothesis H1 is accepted.

Section IV

This section deals with the association of post-test knowledge score on care after cardiac surgery in PICU with the demographic variables among mothers of children under 12 years.

Table 6: Association between demographic variables and post-test knowledge score on care after cardiac surgery in PICU among mothers of children under 12 years n=30

| Demographic variables | Moderate knowledge | | Adequate knowledge | | Chi square test and P value |
|----------------------------|--------------------|------|--------------------|-------|---|
| | No | % | No | % | |
| | <hr/> | | | | |
| 1. Age of Mother | | | | | |
| a) < 25 years | 0 | 0.0 | 2 | 100.0 | $\chi^2 = 2.609$, D.F. = 2 P=0.271 (N.S) |
| b) 26 – 35 yrs | 6 | 33.3 | 12 | 66.7 | |
| c) > 36 years | 1 | 10.0 | 9 | 90.0 | |
| 2. Age of the Child | | | | | |
| a) 1 day – 3 years | 3 | 13.6 | 19 | 86.4 | $\chi^2 = 4.337$, D.F. = 2 P=0.114 (N.S) |
| b) 4 – 8 years | 2 | 50.0 | 2 | 50.0 | |
| c) 9 – 12 years | 2 | 50.0 | 2 | 50.0 | |
| 3. Sex of the Child | | | | | |
| a) Male | 2 | 25.0 | 12 | 75.0 | $\chi^2 = 0.053$, d.f. = 1 P=0.818 (N.S) |
| b) Female | 3 | 21.4 | 11 | 78.6 | |

4. Type of Marriage

| | | | | | |
|-----------------------|---|------|----|------|-------------------|
| a) Consanguineous | 3 | 33.3 | 6 | 66.7 | $\chi^2 = 0.719,$ |
| b) Non Consanguineous | 4 | 19.0 | 17 | 81.0 | d.f. = 1 |
| | | | | | P=0.397 (N.S) |

5. Is your Child

| | | | | | |
|-------------|---|------|----|------|-------------------|
| a) Term | 6 | 23.1 | 20 | 76.9 | $\chi^2 = 0.007,$ |
| b) Pre term | 1 | 25.0 | 3 | 75.0 | d.f. = 1 |
| | | | | | P=0.933 (N.S) |

6. Religion

| | | | | | |
|--------------|---|------|---|-------|-------------------|
| a) Christian | 0 | 0.0 | 9 | 100.0 | $\chi^2 = 3.913,$ |
| b) Muslim | 3 | 33.3 | 6 | 66.7 | D.F. = 2 |
| c) Hindu | 4 | 33.3 | 8 | 66.7 | P=0.141 (N.S) |

7. Family history of**cardiac disease**

| | | | | | |
|--------|---|------|----|------|-------------------|
| a) yes | 1 | 25.0 | 3 | 75.0 | $\chi^2 = 0.007,$ |
| b) no | 6 | 23.1 | 20 | 76.9 | d.f. = 1 |
| | | | | | P=0.933 (N.S) |

8. History of previous**hospitalization**

| | | | | | |
|--------|---|------|----|------|-------------------|
| a) yes | 6 | 40.0 | 9 | 60.0 | $\chi^2 = 4.658,$ |
| b) no | 1 | 6.7 | 14 | 93.3 | d.f. = 1 |
| | | | | | P= 0.031 * |

9. Education of mother

| | | | | | |
|---------------|---|------|----|------|-------------------|
| a) Illiterate | 2 | 100. | 0 | 0.0 | $\chi^2 = 8.801,$ |
| b) Primary | 2 | 40.0 | 3 | 60.0 | d.f. = 3 |
| c) Secondary | 1 | 10.0 | 9 | 90.0 | P=0.032 * |
| d) Graduate | 2 | 15.4 | 11 | 84.6 | |

10. Source of information

| | | | | | |
|------------------------------------|---|------|----|-------|-------------------|
| b) Health professionals | 6 | 27.3 | 16 | 72.7 | $\chi^2 = 0.949,$ |
| c) Internet | 0 | 0.0 | 2 | 100.0 | D.F. = 2 |
| d) health professionals & internet | 1 | 16.7 | 5 | 83.3 | P=0.622 (N.S) |

(N.S) Not Significant at 0.05 level.

The table 6 shows the level of knowledge score during post-test according to demographic characteristics of the mothers of children under 12 years. The chi-square value indicates none of the demographic variables attained significant association except the education of the mother and history of previous hospitalization which is significant at the level $p < 0.05$. Hence the research hypothesis H2 is accepted.

CHAPTER V

DISCUSSION

The present study was aimed at teaching the mothers of under 12 years children after cardiac surgery in order to make them aware of the care given to the children in PICU after cardiac surgery which will alleviate stress and increase coping ability of mothers when the child is in PICU.

This is a one group pre-test and post-test experimental study intended to assess the effectiveness of computer assisted instruction on care after cardiac surgery in PICU in MIOT Hospitals Chennai.

Table 1 reveals that 18(60%) of the mothers belong to the age group of 26-35 years, 22(73.3%) of the mothers had children at the age of 1 day to 3 years. Out of 30 mothers, 9(30%) of them were consanguineously married and only 4(13.3%) had a family history of congenital heart disease. Four (13.3%) of the infants were pre-term during birth which is found to be one of the causes for development of congenital heart disease and 15(50%) of them had a history of previous hospitalization. The study reveals that 22(73.3%) of them got information from the health professionals, out of which majority of the mothers were found to be graduates, that is 13(43.3%).

The first objective of the study was to assess the existing knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years.

In the present study table 2 reveals that the overall mean score was 59.2%. The mothers of children under 12 years had adequate knowledge on the following aspects like elimination needs with a mean score of 93.3%, pain relief measures with a mean score of 85%, and in the knowledge of infection control a score of 86.7%. The other categories like general appearance, ventilator care, suctioning,

monitoring, nutrition, safety personal hygiene, exercise, blood collection, psychological support had moderate knowledge. These results imply that they need education on care after cardiac surgery in PICU.

In the present study table 3 reveals that in pre-test knowledge score, most of the mothers had moderate knowledge 27(90 %) and few of the samples had inadequate knowledge 3(10.0%) regarding care after cardiac surgery in PICU. This implies that they need education on care after cardiac surgery in PICU.

In the present study table 4 shows that Post-test knowledge mean score was 86.67. The figure 3 on post-test knowledge score shows that, mothers of children under 12 years had 76.7% adequate knowledge and 23.3% had moderate knowledge. None of them had inadequate knowledge in post test. This implies that mothers of children under 12 years had shown improvement in gaining the knowledge after CAI.

The investigator found that knowledge of mothers of children under 12 years had increased in post-test. This increase in knowledge is due to the effectiveness of CAI. The findings are consistent with the study done by Anja (2011), she did a study on Hanover Inventory of Parental Knowledge of Congenital Heart Disease; a questionnaire for the assessment of knowledge about congenital heart disease (CHD) for the parents was used. The result revealed that parents have satisfactory knowledge of CHD in some areas, but knowledge about preventive behaviours turned out as rather poor. And she concludes that these need to be improved in order to make parents capable to take care of children after treatment.

The second objective of the study was to assess the effectiveness of computer assisted instruction on the care after cardiac surgery in PICU among mothers of children under 12 years.

In the research hypothesis H1, it was stated that there is significant difference between pre-test and post-test knowledge among mothers of children under 12 years regarding care after cardiac surgery in PICU.

Measures were provided to improve the knowledge through computer assisted instruction regarding care after cardiac surgery in PICU.

Table 5, shows that the participants have obtained a higher knowledge so CAI program is effective in improving knowledge on care after cardiac surgery in PICU among mothers of children under 12 years. It is proved by the obtained t value of $t= 15.69$ which is significant at $p=0.000$. Table 5 shows that the mean post-test knowledge score was 86.6%. The mean score of post-test knowledge was higher than the pre-test knowledge.

The investigator found that there is an improvement in knowledge of care after cardiac surgery in PICU after computer assisted instruction. The obtained t value for post-test knowledge was significant at $p < 0.001$ level. So the research hypothesis H1 is accepted.

These findings are consistent with the study done by the Annakamatchi (2009) which evaluated the effectiveness of CAI package on knowledge and expressed practice of self care among gestational diabetes mellitus mothers. The results revealed that there was a significant difference between the pre-test score and post-test score on knowledge and expressed practice of self care among gestational diabetes mellitus mothers.

Similarly, another study was done by Meier (2005) on the effectiveness on prevention of alcohol abuse using computer assisted instruction. He found that prevention programs typically increase knowledge and appropriate attitudes about

alcohol while having little effect on drinking behaviour. So the researcher also concluded the study was effective by using computer assisted instruction as a teaching aid which increases the knowledge of mothers of children under 12 years who have underwent cardiac surgery.

Another study which supports the researcher is done by Ryhnen AM (2010) aimed at a systematic review to analyze what kind of internet or interactive computer based patient education programs have been developed and to analyze the effectiveness of these programs in the field of breast cancer patient education. The method adopted was randomized control on clinical trials or quasi experimental study. The interventions used were described as interactive computer or multimedia programs and use of the internet. The results suggest a positive relationship between the internet's and computer based education program use and the knowledge level of patients with breast cancer but there is a diverse relationship between patient's participation and other outcome measures.

According to Led Wing Von Bertalanffy General System theory model used in this study describes that the transformation of knowledge to the mothers of children under 12 years given by computer assisted instruction has revealed that they have gained adequate knowledge and no inadequate knowledge on care after cardiac surgery in PICU, this concludes that computer assisted instruction was effective in transformation of knowledge to the mothers of children under 12 years.

The investigator concluded that the Computer Assisted Instruction given to the mothers of children under 12 years was effective. Teaching can also be given to the mothers of children who will undergo cardiac surgery in an outpatient basis, which will help the mothers to gain adequate knowledge regarding care after cardiac surgery

in PICU and it alleviate the stress and improve the coping ability of the mothers before cardiac surgery and when the child is in PICU.

The third objective of the study was to associate post-test knowledge scores on knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years with the selected demographic variables. In the corresponding hypothesis H₂, it was stated that there is a significant association between post-test knowledge and selected demographic variables.

The table 6 shows level of knowledge score during post-test according to demographic characteristics of the mothers of children under 12 years. The chi-square value indicates none of the demographic variables attained significant association except the education of the mother which is significant at the level $p < 0.05$. Hence the research hypothesis H₂ is accepted.

CHAPTER VI

SUMMARY, CONCLUSION, LIMITATIONS, IMPLICATIONS AND RECOMMENDATIONS

This chapter presents the summary and conclusion of the study, nursing implication and recommendations for further study

Summary

A pre-experimental study to assess the effectiveness of computer assisted instruction on knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years in MIOT hospitals, Chennai.

The following objectives were set for the study

1. To assess the existing knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years.
2. To assess the effectiveness of a computer assisted instruction on care after cardiac surgery in PICU among mothers of children under 12 years.
3. To associate post-test knowledge scores on knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years with the selected demographic variables.

On analysis the hypothesis of H_1 , that there is a significant difference between the pre-test and post-test score on knowledge of the care after cardiac surgery in PICU after giving computer assisted instruction among mothers of children under 12 years, and H_2 , that there is a significant association between knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years with selected demographic variables. The entire hypothesis was tested at 0.000 level of significance.

The review of literature included related studies which provided a strong foundation for the study. It also included the basis for conceptual framework and formation of the tool. The conceptual framework of the study was Ludwig Von Bertalanffy General System theory, which provided the comprehensive framework for evaluating the effectiveness of the care after cardiac surgery in PICU. A pre-experimental design was used; one group pre-test, post-test design was used for the study. The population consisted of mothers of children under 12 years after cardiac surgery using a non-probability convenient sampling. The tool used for the data collection was self-administered questionnaire regarding the care after cardiac surgery in PICU.

Major finding of the study

The study findings were as follows

- Regarding distribution of sample according to demographic characteristics were 18(60%) of the mothers belong to the age group of 26-35 years, 22(73.3%) of the mothers had children at the age of 1 day to 3 years. Out of 30 mothers, 9(30%) of them were consanguineously married and only 4(13.3%) had a family history of congenital heart disease. Four (13.3%) of the infants were pre-term during birth which is found to be one of the causes for development of congenital heart disease and 15(50%) of them had a history of previous hospitalization. The study reveals that 22(73.3%) of them got information from the health professionals, out of which majority of the mothers were found to be graduates, that is 13(43.3%).
- The overall percentage of post-test knowledge score on care after cardiac

surgery in PICU was 76.7 % adequate knowledge and 23.3 % moderate knowledge which shows CAI was effective.

- The overall mean of pre-test and post-test knowledge score on care after cardiac surgery in PICU are pre-test 59.2 and post-test 86.67. The paired t value was 15.69 which was significant at $p < 0.001$.

Conclusion

The pre-test level of knowledge regarding care after cardiac surgery was moderate. The pre-test mean score was 59.2 and post-test score was 86.67. The study showed that CAI was effective on improving knowledge of mothers of children under 12 years on care after cardiac surgery in PICU. There was a significant difference in the pre-test and post-test mean knowledge score which were significant at $P < 0.001$. There was significant association between the selected demographic variables and the post-test knowledge score.

Limitations

- The study findings are restricted to mothers having children under 12 year only.
- The sample size was limited to 30 only which restricts generalization.
- The data collection period was limited to 6 weeks.

Nursing implications

The findings of the study have implications in different branches of nursing profession i.e., nursing practice, nursing education, nursing research and nursing administration.

Nursing practice

- Congenital heart disease is one of the major health problems in India today. The prospect of cardiac surgery and admission to a PICU can be a uniquely stressful situation for both children and their parents. So CAI will be helpful in dealing with these stressful times successfully.
- Nurses should make awareness among children and parents through health education.
- The result of the study will help the nurses to improve their knowledge on importance of CAI on care after cardiac surgery in PICU. They also participate in giving advice to mothers of children .under 12 years.
- The CAI program can be used to improve the knowledge on care after cardiac surgery in PICU among mothers of children under 12 years

Nursing education

- With the emerging health care trends, nursing education should focus on care after cardiac surgery in PICU.
- Nurse educator should take initiatives to publish articles and journals on post cardiac care.
- The nurse educator should emphasize health education on care after cardiac surgery as a part of learning experience for the students.
- Students should be encouraged to identify the priority and explain the care of children underwent cardiac surgery.
- The nurse educator shall arrange an in-service education programmes (seminars, workshop) for student nurses on care of children after cardiac surgery.

- Students can utilize the computer assisted instruction to give health education on care after cardiac surgery in PICU among mothers of children under 12 years.
- Students can conduct mass education program in hospitals by using AV aids like hand out, posters, flash cards.

Nursing administration

- The nurse administrator should know about care after cardiac surgery in PICU.
- The nurse administrator should encourage and provide facilities to conduct health education for mothers of children under 12 years.
- The nurse administrator should take the initiative in organizing educational programs on care after cardiac surgery in PICU.
- The nurse administrator should conduct research regarding care after cardiac surgery in PICU to determine the research finding.
- The nurse administrator must make sure that, educational and informational material should be displayed in out-patient department.

Nursing research

- Evidence based nursing practice must take higher profile in order to increase awareness among mothers of children who will undergo surgery.
- This study can be effectively utilized by emerging researchers on current issue.
- The finding of the study may help to expand knowledge upon which further researches can be conducted on the same topic in various settings.

Recommendations

Based on the finding of the present study, the following recommendations are made:

- The study can be replicated using a large sample to validate the findings and make generalizations.
- A comparative study can be conducted among control and experimental group.
- The study could be replicated in different setting with similar facilities
- Comparative study can be conducted among mothers who are illiterate and literate.
- A similar study can be conducted by using different AV aids like IEC.
- A similar study can be conducted by using CAI for different problems like breast feeding, AIDS.

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APPENDIX I

LETTER SEEKING PERMISSION TO CONDUCT THE STUDY

FROM

MRS. NEETHU S ANANDAN
M.SC (N) 1ST YEAR
MIOT COLLEGE OF NURSING
CHENNAI.

FORWARDED THROUGH

PROF.MRS.ANI GRACE KALAIMATHI,M.SC (N),PH.D
PRINCIPAL
MIOT COLLEGE OF NURSING,
CHENNAI.

TO

DR.ROBERT COELHO.MS, Mch,
DIRECTOR & SENIOR CHIEF PEDIATRIC CARDIAC SURGEON,
MIOT HOSPITALS.
CHENNAI.

Respected sir,

Subject: Requesting permission to conduct Study

As a part of M.Sc.N requirement under the fulfillment of Tamilnadu Dr.M.G.R Medical university, Guindy, Chennai. I 'm conducting "A Pre-Experimental Study to Assess The Effectiveness of Computer Assisted Instruction on knowledge of care after cardiac surgery in PICU among mothers of children under 12 years in MIOT Hospitals, Chennai." Kindly grant me permission to conduct my research study in your department and do the needful.

Thanking you

Yours sincerely

Neethu S
NEETHU S



Robert Coelho
1/4/11

APPENDIX II
INFORMED CONSENT FORM

I am **Neethu.S.Anandan** M.Sc nursing student studying at MIOT College of Nursing, Chennai.

As a part of my research studies, a research on “**A pre-experimental study to assess the effectiveness of computer assisted instruction on knowledge of the care after cardiac surgery in PICU among mothers of children under 12 years in selected hospitals at Chennai.**”, is proposed to be conducted. The finding of the study will be helpful in improvement of mother’s knowledge.

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

I ----- hereby consent to participate and undergo the study

Place :-

Date :-

Signature of the participant

APPENDIX IV

Lesson plan

| | | |
|--------------------|---|---|
| Place | : | MIOT Hospitals. |
| Topic | : | Care of children in PICU after cardiac surgery |
| Language | : | Tamil and English |
| Duration | : | 30 Minutes |
| Learners | : | Parents of children underwent cardiac surgery. |
| Teacher | : | Neethu S Anandan. II nd year M.Sc. (N) |
| Method of teaching | : | Lecture |
| Audio visual aid | : | Computer assisted instruction |

CENTRAL OBJECTIVES:

The Parents will be able to understand and gain knowledge about care of children in PICU after cardiac surgery, also develop desirable attitude towards taking care of children after cardiac surgery.

BEHAVIOURAL OBJECTIVES:

The mothers of children under 12 years after cardiac surgery will be able to

- state about PICU.
- elaborate the general appearance of the child in PICU after surgery.
- outline the infection control in PICU.
- explain the intubation of the child in PICU.
- enumerate the sample collection to the child in PICU.
- elucidate the positioning of the child after cardiac surgery in PICU.
- discuss the nutrition for the child after cardiac surgery in PICU.
- describe the exercises for the child after cardiac surgery in PICU.
- list out the hygienic measures undertaken for the child in PICU.
- enlist the psychological support and play need for the child.

INTRODUCTION: Good morning, I am Neethu S Anandan doing my M.Sc. (N) second year in MIOT College of nursing. I am doing a research on parental knowledge of care of children in PICU after cardiac surgery. So we will discuss about care of children in PICU after cardiac surgery through computer assisted instruction.

| SI NO. | OBJECTIVES | TIME | CONTENT | TEACHERS ACTIVITY | LEARNER ACTIVITY |
|--------|--|-------|---|-------------------|------------------|
| 1. | The mothers of children under 12 years after cardiac surgery will be able to state about PICU. | 3 min | <p><u>INTRODUCTION (PICU)</u></p> <p>Pediatric critical care provides a multidisciplinary approach to care for children who have progressive and rapidly changing complex surgical, medical and traumatic issues. PICUs or (Pediatric Intensive Care Units) assist and provide for the special needs of injured or critically ill children and their families. Children are entirely dependent upon their adult carers to provide for all their physical and emotional needs.</p> | Explaining | Listening |
| 2. | The mothers of children under 12 years after cardiac surgery will be able to elaborate the general appearance of the child in PICU after | 3 min | <p><u>GENERAL APPEARANCE OF THE CHILD IN PICU</u></p> <p>There will be several tubes, wires, and machines attached to your child. While these can be scary to parents, each one serves an important purpose: to help your child. Your child will be on a large bed with safety rails on the sides. These rails must be all the way up whenever someone is not directly next to the bed providing care.</p> <ul style="list-style-type: none"> • At first, no clothes or blankets will be used so that the doctors and nurses can observe your child very closely. Heating lamps may be used to help keep your child warm. • A breathing tube goes into the mouth or nose. It is connected to a | Explaining | Listening |

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| | surgery. | | <p>ventilator, which breathes for and gives oxygen to your child. Your child will be sedated most of the time he or she is on a ventilator. The breathing tube goes through the voice box, so your child cannot make sounds or talk. The nurses will do suction via breathing tube at times to clean out the mucus.</p> <ul style="list-style-type: none"> • There will be an incision, covered by a bandage, on the chest where the doctor did the surgery. Bruises on the chest are normal. One or two chest tubes will be just below the incision. These tubes drain air, fluid, and blood from around the heart. You may see the nurses squeeze the tubes to keep them from getting plugged. • A catheter (small tube) in the bladder drains the urine. The nurse will empty the collection bag often to measure the volume of urine. • Your child will not be able to eat or drink while on the ventilator. A nasogastric tube (NG tube) is in the nose and down into the stomach to keep it empty of air and fluids. If the ventilator is used for more than 3 days, the tube will be used to give liquid food. • Intravenous lines (IVs) will be in the neck, hand, and foot to give fluids and medicines. Antibiotics will be given to help prevent infections. Pain relievers, such as morphine, will be given for comfort. • A central line (CVP) is an IV that the doctor puts in a neck vein | | |
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for monitoring important information, and also for giving continuous IV medicine(s). As your child's heart recovers from the surgery, these medicines will be tapered off.

First 24 hours

- Vital signs, respiratory status, pain status, the incision, and any drainage tubes should be monitored every one to two hours for at least the first eight hours.
- Body temperature must be monitored, since patients are often hypothermic after surgery, and may need a warming blanket or warmed IV fluids.
- Respiratory status should be assessed frequently, including assessment of lung sounds (auscultation) and chest excursion, and presence of an adequate cough.
- Fluid intake and urine output should be monitored every one to two hours. If the patient does not have a urinary catheter, the bladder should be assessed for distension, and the patient monitored for inability to urinate. The physician should be notified if the patient has not urinated for six to eight hours after surgery.
- The patient may require medication for nausea or vomiting, as well as pain.

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| | | <ul style="list-style-type: none">• Patients should be kept NPO (nothing by mouth) if ordered by the surgeon, at least until their cough and gag reflexes have returned• Patients often have a dry mouth following surgery, which can be relieved with oral sponges dipped in ice water or lemon ginger mouth swabs. <p><u>AFTER 24 HOURS</u></p> <ul style="list-style-type: none">• vital signs can be monitored every four to eight hours if the patient is stable.• The incision and dressing should be monitored for the amount of drainage and signs of infection.• If patients understand that they must perform respiratory exercises to prevent pneumonia; and that movement is imperative for preventing blood clots, encouraging circulation to the extremities, and keeping the lungs clear; they will be much more likely to perform these tasks.• Respiratory exercises (coughing, deep breathing, and incentive spirometry) should be done every two hours.• The patient should be turned every two hours,• Patients should be kept NPO (nothing by mouth) if ordered by the surgeon, at least until their cough and gag reflexes have returned.• A drain tube, if present, must be monitored for quantity and | | |
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| 3. | The mothers of children under 12 years after cardiac surgery will be able to outline the infection control in PICU. | 2 min | <p>quality of the fluid collected.</p> <ul style="list-style-type: none"> • Sutures, skin staples, and other closures are usually left in place 7 days or longer depending on the site and the patient. <p><u>INFECTION CONTROL</u></p> <ul style="list-style-type: none"> • Thoroughly wash hands before and after attending the patient • Apply sterium hand wash solution at bedside. • Rewash hands every time either a vascular catheter and its connection or the tracheal tube and its connection is touched. • Separate equipments to each patients. • All trolleys are cleaned before a bedside procedure is done. • Walls and floors are cleaned with 5% hydrochloride solution diluted with water. May be cleaned with detergent and water. • All invasive catheters inserted is put in with full aseptic precautions. • Aseptic technique is a method that is designed to reduce the risk of microbial contamination in a vulnerable body site. This may include such procedures as undertaking a wound dressing or performing an invasive procedure such as inserting a urinary catheter or preparing an intravenous infusion. <p>➤ <u>ESSENTIAL ACTIONS FOR ALL PROCEDURES</u></p> <ul style="list-style-type: none"> • Dispose of single-use items after one use | Explaining | Listening |
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| 4. | The mothers of children under 12 years after cardiac surgery will be able to enumerate the sample collection to the child in PICU. | 2 min | <ul style="list-style-type: none"> • Dispose of single patient use items after treatment • Decontaminate re-usable items according to local policy and manufacturer’s instructions • Store sterile equipment in clean, dry conditions, off the floor • Dispose of waste as per local policy • Minimise interventions that result in a break in closed systems e.g. manipulation of IV lines <p><u>BLOOD COLLECTION</u></p> <p>a. <i>Practice universal precautions:</i></p> <ul style="list-style-type: none"> • Wear gloves when handling blood/body fluids. • Change gloves after each patient or when contaminated. • Wash hands frequently. • Dispose of items in appropriate containers. • Dispose of needles immediately upon removal from the patient’s. • Clean up any blood spills with a freshly made 10% bleach disinfectant. <p>b. <i>Protect the patient</i></p> <ul style="list-style-type: none"> • Place blood collection equipment away from patients, especially children. | Explaining | Listening |
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| 5. | The mothers of children under 12 years after cardiac surgery will be able to explain the intubation of the child in PICU. | 2 min | <p><u>PROCEDURE FOR INTUBATION</u></p> <p><u>Reason for procedure</u></p> <p>a.) protection from gastric aspiration and secretions</p> <p>b.)access and maintenance-in difficult airway and difficult surgical positions/procedures</p> <p>c.) provide positive pressure ventilation- can be done for shorter periods with a mask or Oxylog</p> <p>d.) oxygenation- to provide a controlled concentration of oxygen up to 100%, also provides for complete scavenging</p> <p>e.) secretions- facilitates removal of secretions via suctioning</p> <p><u>Suctioning</u></p> <p>Endotracheal suctioning is a component of bronchial hygiene therapy and mechanical ventilation and involves the mechanical aspiration of pulmonary secretions from a patient with an artificial airway in place.</p> <p><u>Procedure</u></p> <p>The placement of a suction catheter through the artificial airway into the trachea and the application of negative pressure as the catheter is being withdrawn. Sterile technique should be employed. Each pass of the suction catheter into the artificial airway is considered a suctioning event. The duration of each suctioning event should be</p> | Explaining | Listening |
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| 6. | The mothers of children under 12 years after cardiac surgery will be able to elucidate the positioning of the child after cardiac surgery in PICU. | 3 min | <p>approx-imately 10-15 seconds.(13) Suction pressure should be set as low as possible and yet effectively clear secretions.</p> <p><u>Follow up</u></p> <ul style="list-style-type: none"> • the patient should be hyperoxygenated by delivery of 100% oxygen for > or = 1 minute by the same technique(s) used to preoxygenate the patient. • the patient may be hyperventilated by increasing the respiratory rate and/or tidal volume by the same technique(s) used prior to suctioning. • the patient should be monitored for adverse reactions. <p><u>POSITIONING (PREVENTION OF BED SORE)</u></p> <p><u>Positioning</u></p> <p>The turning of all critically ill patients every two hours around the clock is done unless contraindicated, with skin assessment recorded as part of the every four-hour assessment. If turning is contraindicated, pressure points will be relieved q2h. If pressure relieve is not possible, rationale will be documented.</p> <p><i>Rationale:</i> This is to relieve pressure points and allow for skin perfusion as well as provide reference for comparison of skin care.</p> <p><u>Definition</u></p> <p>Bed sore is gangrene, or death of the tissue of the</p> | Explaining | Listening |
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affected parts. The bony prominences such as the lower part of the spine, the shoulder blades, elbows, and heels are the parts most likely to be affected. Moisture, wrinkles, crumbs, and a too long continuance in one position are the pre-disposing causes.

Skin care

- Skin of the "at risk" patient should be inspected on admission then at least daily &
- after a significant event.
- Bony prominences should especially be examined for persistent discolouration.
- Skin changes should be documented and the area given particular attention.
- Skin should be cleansed when exposed to bodily fluids or other soiling.
- If frequent soiling occurs action should be taken to control the source of moisture,
- e.g. continence management.
- Harsh cleansing agents should be avoided.
- Moisturises are helpful for dry skin.
- Nutritional assessment of the "at risk" patient should be performed on admission
- and diet should be monitored.

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| 7. | The mothers of children under | 5 min | <ul style="list-style-type: none"> • Oral intake should be encouraged with nutritional supplements if necessary. • If oral intake remains insufficient actions such as enteral feeding should be • considered. • Intervention • Turning is useful in rotating pressure prone areas. Frequency should be based on skin inspection. The frequency should be increased if skin discolouration persists. • Positioning should avoid direct pressure on bony prominences • Pillows and foams should be used to reduce contact between bony prominences • and support surfaces • Massaging of bony prominences and the use of doughnut shaped devices should be avoided • Bed heads should be no higher than the lowest elevation • Lifting devices and aids such as sail cloth should be used to reduce friction when • moving patients. <p><u>NUTRITION</u></p> <p>Healthy children need regular nourishment, including energy (ie, carbohydrates and fat), protein, vitamins, and minerals, for</p> | Explaining | Listening |
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| | <p>12 years after cardiac surgery will be able to discuss the nutrition for the child after cardiac surgery in PICU.</p> | | <p>maintenance and growth. Surgical patients need nourishment for optimal wound healing. The daily nutritional needs of healthy children are best met by a balanced oral diet. However, this may not be possible in surgical patients.</p> <p>Nutrient Neonates/Infants Children 2-12 y Adolescents</p> <p>Energy (cal/kg/d) 80-100 60-80 30-40</p> <p>Protein (g/kg/d) 1.2-1.8 1 0.8</p> <p><u>Nutritional assessment</u></p> <ul style="list-style-type: none"> • The nutritional status of surgical patients can be assessed in several ways, as follows: • Clinical (history and physical examination) • Anthropometry • Biochemical tests • Body composition <p><u>Parenteral Nutrition</u></p> <p>The choice of venous access for parenteral feeding primarily depends on the duration of TPN. For short-term needs, peripheral intravenous lines can be used as long as 7-10 days, especially in infants, for whom lower concentrations of dextrose (<12.5%) combined with lipid emulsions can deliver adequate calories. However, with peripheral-vein TPN, intravenous lines have to be frequently changed, and tissue damage is always a risk with extravasations.</p> | | |
|--|--|--|--|--|--|

| | | | | | |
|----|--|----------|--|------------|-----------|
| 8. | The mothers of children under 12 years after cardiac surgery will be able to describe the exercises for the child after cardiac surgery in PICU. | 2 min | <p><u>EXERCISES</u></p> <p>All intensive care patients will have chest physiotherapy q4h and whenever required unless contraindicated. The frequency will be recorded on the flow sheet documented in progress note.</p> <p><i>Rationale:</i> Immobility increases the risk for the retention of secretions and reduced ventilation.</p> <p>All critical care patients will have range of motion exercises q4h unless contraindicated (i.e. neuromuscular blockers). This will be recorded on the flow sheet treatment section and in clinical record.</p> | Explaining | Listening |
| 9. | The mothers of children under 12 years after cardiac surgery will be able to list out the hygienic measures undertaken for the child in PICU. | 5 min | <p><u>HYGIENE</u></p> <p>All Critical Care patients will have mouth care done every four hours with inspection for oral skin sores. Teeth will be brushed every shift and as needed.</p> <p>Perineal care will be done every shift and as needed</p> <p>Routine daily baths will be done on night shift. This will include total skin care, fingernails and hair washing q. weekly and all dressings unless otherwise indicated will be changed daily.</p> <p>Dressing</p> <p>Site care as prescribed by physician or agency policy.</p> <p>a. Strict aseptic technique for any care.</p> | Explaining | Listening |

| | | | | | |
|-----|--|-------|--|------------|-----------|
| 10. | The mothers of children under 12 years after cardiac surgery will be able to enlist the psychological support and play need for the child. | 3 min | <p>b. If no dressing, site may be cleansed using prescribed solutions such as half-strength hydrogen peroxide followed by povidone-iodine</p> <p>c. If dressing changes ordered, use procedure for changing central line dressing</p> <p><u>PSYCHOLOGICAL SUPPORT</u></p> <ul style="list-style-type: none"> ➤ The nurse will talk, cuddle the baby and play with the baby. ➤ The parents will be explained clearly all doubts. ➤ The mother will be allowed in PICU all the feeding techniques and handling the baby will be clearly explained till she is confident. ➤ One nurse will take care of one patient in PICU <p><u>PLAY THERAPY</u></p> <ul style="list-style-type: none"> • Play is the essential component of child’s life. • Many toys are available in PICU according to the child’s age the toys are given. • The children are given plenty of time and opportunities for play. • Each patient will be given separate play materials to play in PICU. • Play materials will be cleaned frequently so that there is no chance of spread of infection. | Explaining | Listening |
|-----|--|-------|--|------------|-----------|

SUMMARY:

So far we have discussed about general appearance of the child, infection control, intubation of the child, sample collection to the child, position of the child after cardiac surgery, exercise for the child after cardiac surgery and hygienic measures undertaken for the child in PICU after cardiac surgery.

CONCLUSION:

Thank you for your kind cooperation. I hope the Computer Assisted Instruction given was useful and informative and you would have gained knowledge about the care given to the child in PICU, so that it will be helpful to alleviate stress and improve coping ability when the child is undergoing surgery and when in PICU.

APPENDIX III

PART I

SECTION I

DEMOGRAPHIC VARIABLE OF THE PARENTS OF CHILDREN

UNDERGONE CARDIAC SURGERY

INSTRUCTION

Please read every question carefully and put tick mark () and indicate the response that you choose in the space provided. These answers will be kept confident.

- 1) Sample no _____
- 2) Name of surgery _____
- 3) Date of surgery _____
- 4) Age of the mother
 - a) <25 years
 - b) 26- 35 years
 - c) >36 years ()
- 5) Age of the child
 - a) 1 day-3 years
 - b) 4-8 years
 - c) 9-12 years ()
- 6) Sex of the child
 - a) Male
 - b) Female ()
- 7) Type of marriage
 - a) Consanguineous marriage
 - b) Non Consanguineous marriage ()
- 8) Is your child
 - a) term
 - b) pre term ()

- 9) Religion
- a) Christian
 - b) Muslim
 - c) Hindu
 - d) others ()
- 10) Family history of cardiac disease_____
- 10) History of previous hospitalization _____
- 11) Education of mother
- a) Illiterate
 - b) Primary
 - c) Secondary
 - d) Graduate ()
- 12) Source of information
- a) magazines
 - b) health professionals
 - c) internet
 - d) health professionals and internet. ()

PART II
SECTION A
KNOWLEDGE QUESTIONNAIRE ON CARE OF CHILD
IN PICU

General appearance of child in PICU

- 1) What is the purpose of keeping the child in PICU
 - a) To provide intensive care
 - b) To isolate the child
 - c) To prevent infection. ()
- 2) How the respiration of your child is maintained?
 - a) Hemodynamic monitoring
 - b) ventilator
 - c) pressure pumps ()

Ventilator care

- 3) What is the use of ventilator for your child?
 - a) Breathes for the baby and gives oxygen
 - b) Helps in administering IV fluids
 - c) Allows to drain fluids ()
- 4) What is the use of small tube in the mouth during initial period of ventilation?
 - a) To administer fluids
 - b) To provide liquid foods
 - c) To empty air from stomach ()
- 5) How often eye care is given to the baby in ventilator?
 - a) once a day
 - b) every hourly
 - c) every 2nd hourly ()

Suctioning

- 6) How the secretion of your child is cleared?
 - a) Aspiration of secretion

- b) By Providing hydration
 - c) By Providing nutrition ()
- 7) Why the suctioning is done for the baby?
- a) To keep the airway clear and prevent aspiration.
 - b) To prevent infection
 - c) To promote exercise ()
- 8) How many times the suction catheter is used?
- a) single use
 - b) double use
 - c) thrice. ()

Monitoring

- 9) How often your baby's vital sign is checked?
- a) hourly
 - b) second hourly
 - c) fourth hourly ()
- 10) Why is the painless patch(electrode) is placed over the chest of your baby?
- a) To monitor temperature
 - b) To monitor hearts activity(ECG)
 - c) To monitor x ray ()

Nutrition

- 11) How the nutrition of your baby is met during the period of ventilation?
- a) intravenous
 - b) NG tube feeds
 - c) Oral feeds ()
- 12) How the nutrition is maintained when the child is not taking orally?
- a) IV fluids
 - b) NG tube feeds
 - c) Oral feeds ()
- 13) How the fluid balance of your child is maintained?
- a) By maintaining IO chart
 - b) By providing nutrition
 - c) By providing hydration ()

14) What is the first test food given to the baby through NG/ORAL?

- a) Water
- b) Milk
- c) Juice. ()

Elimination

15) What is the use of small tube in the bladder?

- a) To drain urine
- b) To stop urine flow
- c) To collect samples ()

Comfort

Pain relief measures

16) How your child's pain is minimized after cardiac surgery?

- a. By providing comfortable position
- b. By administering medications
- c. By providing toys ()

17) How the pain of your child is minimized before removal of chest drainage?

- a. By giving sedation
- b. By giving feed
- c. Through diversional activities ()

Safety

18) What is the safety device used to prevent the child from fall?

- a) Safety rails
- b) Monitors
- c) Machines ()

Personal hygiene

19) How the hygienic measures are performed to your child in PICU?

- a. Bath, mouth care& skin care
- b. Changing position of the baby
- c. Changing the NG tube every 2 days ()

20) What will be the measure to provide skin care to your child in PICU?

- a. Change the position every 2nd hourly
- b. Provide moisturizers

- c. Cleansing agents will be used ()
- 21) What will be done to prevent dryness of the mouth?
- a) By Administering fluids
 - b) By Providing nutrition
 - c) By Applying lubricants ()

Exercises

- 22) What is the exercise given to the child during the initial period of cardiac surgery?
- a) Active exercises
 - b) Passive exercises
 - c) Chest physiotherapy ()
- 23) What is the use of chest physiotherapy to your child?
- a) By Promoting comfort
 - b) To Prevent retention of secretion
 - c) To Promote hydration. ()
- 24) What are the respiratory exercises given to your baby after removal of ventilator tube?
- a) Coughing & deep breathing exercises
 - b) Incentive Spirometry
 - c) Both a and b ()

Blood collection

- 25) What will be the initial step carried out by the care giver before collecting the blood sample?
- a) Hand washing
 - b) Wearing gloves
 - c) Cleaning the site with spirit ()

Infection control

- 26) How the infection is prevented to your baby in PICU by the care giver?
- a) Not touching the baby
 - b) Frequent hand washing
 - c) Not touching other babies ()
- 27) What is the universal precaution followed by the nurses in preventing infection?
- a) Wearing cap, mask, gloves, and gown.

- b) Wearing cap, gown.
- c) Wearing mask only ()

Psychological support

28) What is the ratio of nurse child in PICU?

- a) 1:3
- b) 1:2
- c) 1:1 ()

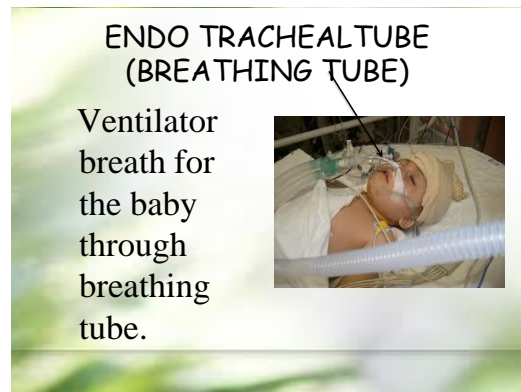
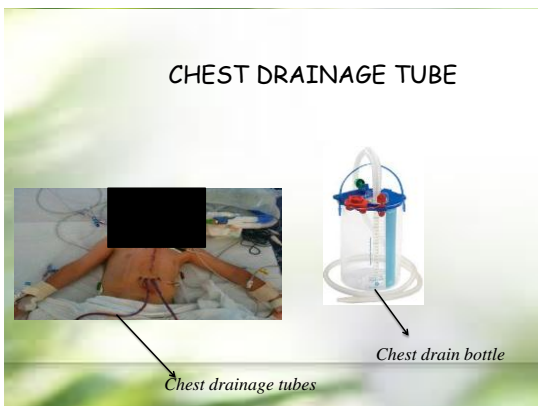
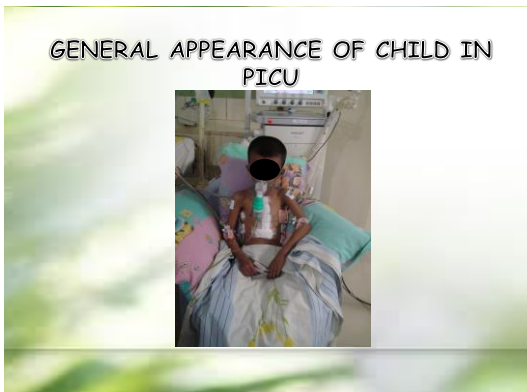
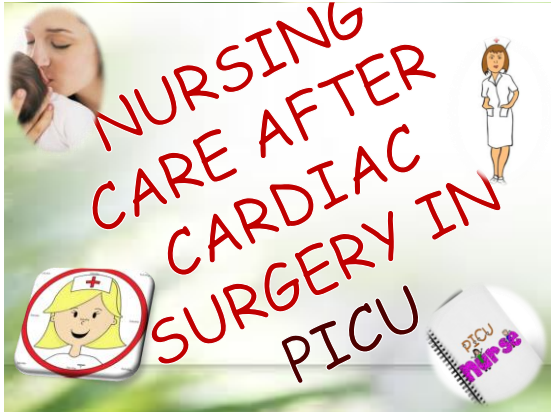
29) How the parents are relieved from anxiety after cardiac surgery?

- a) Allowing mothers to handle the baby in PICU.
- b) Proper explanation and clearing doubts to parents.
- c) Not allowing the parents in PICU ()

30) How the child is prevented from loneliness?

- a) providing comfortable need to your child
- b) nurse interaction with the child
- c) giving play materials to the child ()

APENDIX V
TEACHING MODULE



CHILD WITH VENTILATOR



Once the child is taken out from the breathing tube he/she will be on nasal prongs or oxygen hood through which oxygen will be supplied to your baby.



Nasal prongs



Oxygen hood

NG TUBE



NG TUBE

URINARY CATHETER



URINE COLLECTION BAG

CENTRAL LINES



- Inserted in the neck
- Monitoring.
- Continuous IV medications



Oral care

- To promote normal hygiene
- The presence of breathing tube can cause hypersalivation in some children and dry mouth in others.
- 2nd hourly oral care is given using water or saline.
- The lips will be kept mousturized.

Eye care

- 2nd hourly eye care is given using moisturizer eye drops to help reduce the dryness of eye

SUCTIONING

- ✓ Aspiration of secretion from mouth, nose with the help of mechanical device

PURPOSE

- ✓ To provide mouth care
- ✓ To keep the airway clear

Procedure

- ✓ Hands will be washed
- ✓ Sterile gloves will be worn.
- ✓ Suctioning will be done.

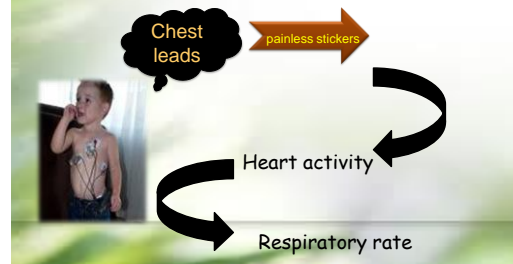
MONITORING

Monitoring are continuous through monitors in PICU which will be displayed, and all the values are entered in the nurses chart accordingly.

MONITOR



MONITORING



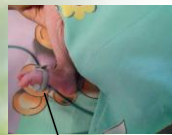
PULSE OXYMETRY



BP CUFF



For the newborn, the oxygen saturation is through probe which will be placed in the foot of the baby, red light will be emitted in the probe.

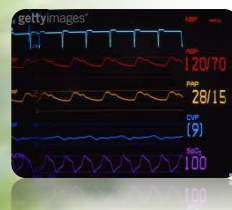


Pulse probe

INVASIVE MONITORING

- Central venous pressure
- Pulmonary artery pressure
- Left atrial pressure

MONITORING IN MONITORS



FIRST 48 HOURS

EVERY HOURLY

- Vital signs,
- respiratory status,
- pain status,
- drainage tubes
- Fluid intake and urine output.

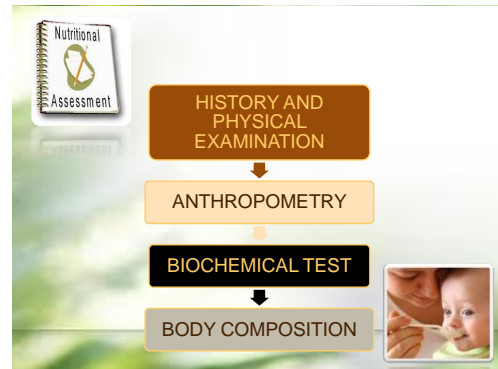


AFTER 48 HOURS

- ✓ Vitals every 2nd hourly.
- ✓ Amount of drainage from incision
- ✓ Respiratory exercises
 - # coughing and deep breathing exercise
 - # chest physiotherapy.
- ✓ Positioning every 2nd hourly



NUTRITION



- The initial test feed will be water, once water is tolerated other feeds will be started
- Once the NG tube feed is tolerated the baby will be tried with oral feeds



NURSE FEEDING THE BABY



COMFORT

PAIN
RELIEF
MEASURES

SAFETY

PAIN RELIEF MEASURES

- ✓ Pain relief measures starts from the time of surgery till recovery
- ✓ Initially your child will be given medications through infusions, later will be given orally soon after the oral intake is tolerated.
- ✓ During removal of chest drainage tube the child will be given sedation and pain relieving medications.
- ✓ Child will be comfortable during minor activities.



SAFETY

safety rails



To prevent
child from
fall

RADIANT WARMER



Side rails

PERSONAL HYGIENE

Bath

Dressing

Mouth care

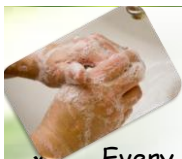
Skin care



SKIN CARE

- Bony prominences will be examined
- Skin will be cleansed when exposed to bodily fluids.
- Fluids are administered to maintain skin turgor.
- Position will be changed every 2nd hourly.
- Pillows and foams will be used to reduce contact between bony prominences.

HYGIENE



DRESSING

- ✓ Every day your child dressing is changed
- ✓ Strict aseptic technique will be followed during change in dressing.



EXERCISES

- Chest physiotherapy
- Coughing and deep breathing exercises
- Incentive spirometry.



CHEST PHYSIOTHERAPY

- Given during initial period of ventilation.
- To prevent retention of secretion.

CHEST VIBRATOR



CHILD BLOWING SPIROMETRY



BLOOD COLLECTION

- ❖ Hands will be washed
- ❖ Gloves will be worn.
- ❖ Site will be cleaned with spirit.
- ❖ Blood will be collected from invasive line which is a painless procedure.
- ❖ The used articles will be discarded after each use.



INFECTION CONTROL

- Frequent hand washing will be done before and after touching the baby.
- Bed side will be cleaned daily.
- Walls and floors will be cleaned with water and 2% bacilloid.



INFECTION CONTROL



- Universal precautions like wearing cap, mask, gloves, and gown will be followed.

- ✓ Each patient will be given separate play materials to play in PICU.
- ✓ Play materials will be cleaned frequently so that there is no chance of spread of infection.

PSYCHOLOGICAL SUPPORT

- The nurse will talk, cuddle the baby and play with the baby.
- The parents will be explained clearly all doubts.
- The mother will be allowed in PICU all the feeding techniques and handling the baby will be clearly explained till she is confident.

The nurse playing with the child



One nurse will take care of one patient in PICU



PSYCHOLOGICAL SUPPORT



PLAY THERAPY



- Play is the essential component of child's life.
- Many toys are available in PICU according to the child's age the toys are given.

TOYS IN PICU



A boy playing with toy in PICU



- The children are given Plenty of time and opportunities for play.



Constant attention by a good nurse
may be just as important as a major
operation by a surgeon.

- Dag Hammarskjold

