EFFECTIVENESS OF NURSING CARE ON CHILDREN WHO UNDERWENT CARDIAC SURGERY

By

Ms. P. GRACE LEEDA

Dissertation Submitted to

THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY,

CHENNAI

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

MARCH - 2010

CERTIFICATE

This is to certify that **"EFFECTIVENESS OF NURSING CARE ON CHILDREN WHO UNDERWENT CARDIAC SURGERY"** is a bonafide work done by **MS.P.GRACE LEEDA**, Adhiparasakthi College of Nursing, Melmaruvathur – 603 319 in partial fulfillment for the University rules and regulations towards the award of degree of Master of science in Nursing, **Branch – II, PAEDIATRIC NURSING,** under our guidance and supervision during the academic period 2008 – 2010.

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APPROVED BY DISSERTATION COMMITTEE
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CHAPTER - I

INTRODUCTION

A baby's heart begins to develop shortly after conception. During development, structural defects can cause congenital heart defects or heart problems may present at birth. Congenital heart diseases will happen when the heart does not develop normally before birth. About 1% of infants are born with one or more heart or circulatory problems all over the world.

A congenital heart defect is a problem with the structure of the heart. It may present at birth. Congenital heart defects are the most common type of major birth defect. These defects can involve the walls of the heart, the valves of the heart and the arteries and veins near the heart. Congenital heart defects can disrupt the normal flow of blood through the heart.

The blood flow can

- Slow down
- Go in the wrong direction or to the wrong place
- Be blocked completely

Each year, roughly 36,000 babies are born with congenital heart disease in the United States, which amounts to almost one child in every one hundred being born with some form of congenital heart disease.

We can usually detect most heart defects while the child is still very young. Some children live with a defect for years before it is diagnosed. In some cases, doctors can spot congenital heart defects before the baby is even born. They cannot diagnose all defects before birth though, because the heart continues to develop in the days after the baby is born.

A physician may suspect that one of these heart defects is present if a child is not growing normally, having breathing problems at birth, has a heart murmur or has one or more signs (e.g., a bluish tint to the skin called cyanosis). Various diagnostic tests are available to help physicians to find out the exact cause of the heart problem and to determine the proper treatment.

Although there is a time when children born with congenital heart disease often has little hope for a full life, modern medicine

now provides multiple treatment options. Congenital heart disease may be treated with certain medications, minimally invasive procedures, and surgeries that offer the promise of a much brighter and healthier future. There are approximately one million Americans living today with a congenital heart defect. The advancements have been so successful over the last forty years that there are more adults alive today with treated congenital heart disease than children with congenital heart disease .

Treatment for the defect can include medicines, surgery and other medical procedures and heart transplants. The treatment depends on the type and severity of the defect and a child's age, size and general health. Today, many children born with complex heart defects grow to adulthood and lead productive lives.

Cheng SQ. et. al., (2008) investigated the efficiency and safety of interventional treatment for combined congenital heart disease in children. The intervention operation was successfully performed in all of the eight patients. No residual shunt was found and all the occlusion devices were in the suitable sites shown by transthoracic echocardiography and X-ray right after the operation. No complications were observed during the follow-up.

Transcatheter interventional therapy for childhood combined congenital heart disease can obtain satisfactory results by proper procedures.

Tribak M. et. al., (2008) appreciated short and midterm results of patients after surgical closure of the ventricular septal defect. 30 patients underwent a surgical closure of ventricular septal defect. No operative mortality was observed. This study demonstrates that surgical closure of ventricular septal defect ensures a good outcome in short and midterm. Nevertheless, the risk of delayed complications justifies long-term and regular follow-up.

Zhang K. et. al., (2008) investigated the influence of Congenital Heart Disease on the mentality and behavior in children, and to compare post operative mentality and behavior in children receiving interventional therapy and congenital heart surgery. They concluded that congenital heart disease is associated with increased abnormal mentality and behavior of the children. Early treatment, especially the interventional therapy can significantly improve the mentality and behavior of the children with congenital heart disease.

Godart F. (2006) noted that for more than 20 years, interventional cardiac catheterization has considerably increased in the therapeutic management of simple congenital heart disease in childhood. It is possible to correct pulmonary or aortic valvar stenosis, to close a persistent shunt as patent arterial duct or atrial septal defect. Sometimes, it can replace surgical repair and can be proposed as a first line treatment. Interventional cardiac catheterisation has several advantages for the patient, no thoracotomy, no scar, shorter hospital stay, less painful, lower morbidity and reduced cost.

Jiang SL. et. al., (2006) analyzed the feasibility and efficacy of intra operative hybrid in 20 patients with congenital heart disease. A hybrid operation is a joint procedure involving the interventional cardiologist and the cardiac surgeon concomitantly to optimize surgical management for complex congenital heart disease. No device-related complications were found during follow-up (one to six months).The result showed that intraoperative hybrid procedure was feasible and effective in selected patients with congenital heart disease.

Williams WG. et. al., (2005) described that closed heart surgery in congenital heart disease can be palliative or corrective. Palliative surgery aims at improving the physiologic deficit rather than the anatomic defect of the heart. Palliative procedures aim to increase pulmonary blood flow in cyanotic children with decreased pulmonary blood flow (Blalock-Taussig shunt), decrease pulmonary blood flow when there is unrestricted flow (pulmonary artery banding), or improve venous mixing in cyanotic children that require pulmonary and systemic venous mixing for survival (atrial septectomy).

Pfammatter JP. et. al., (2001) said that recent developments in the field of pediatric cardiac surgery and pediatric cardiology have led to significant changes in the surgical approach to the various cardiac malformations. There is a clear trend towards surgical treatment at a younger age of the patient, towards complete correction of malformations instead of staged procedures with initial palliation and delayed correction. Refinements in the use of surgical implants have led to new possibilities of correction of complex malformations early in life, especially with regard to the use of biological prosthesis for valvar or outflow tract replacement.

NEED FOR THE STUDY

Congenital heart disease affecting approximately one in every 125 babies born and these congenital heart defects are the most common birth defects.

Forty thousand people are born each year with a congenital heart disease, 4,000 will not survive their first year. The eighth most common defects account for 80% of all congenital heart diseases, while the remaining 20% consist of many independently infrequent conditions or combinations of several defects. Ventricular septal defect is generally considered to be the most common type of malformation, accounting for about 1/3 of all congenital heart defects.

The incidence is higher when a parent or a sibling has a heart defect (4–5%), in stillborns (3–4%), abortuses (10–25%), and premature infants (2%).

The number of adults with problems connected to a congenital heart defect is rising, passing the number of children with congenital heart defects in most Western countries. This

group is referred to as grown-up congenital heart disease patients.

Kapoor R. (2008) aimed to study the prevalence, age-wise distribution, and clinical spectrum of congenital heart disease at a multi-specialty corporate hospital in North India. A retrospective analysis of records of 10,641 patients over a five-and-a-half year period was done. Clinical examination, echocardiography and color doppler were used as diagnostic tools. A prevalence of 26.4 per 1000 patients was observed. Ventricular septal defect was the commonest lesion (21.3%), followed by Atrial septal defect in 18.9% and Patent ductus arteriosus in 14. 6%. Tetralogy of Fallot was the commonest cyanotic heart disease (4.6%). Maximum number of children with heart disease (82.9%) were diagnosed between birth to three years of age.

Professional Guide to Diseases, (2005) reported that atrial septal defect is present in four of every 100,000 people. Symptoms usually develop before age 30. Less than 1% of neonates are born with ventricular septal defect. In 80% to 90% of neonates who are born with this disorder, the hole is small and will usually close

spontaneously. In the remaining 10% to 20% of neonates, surgery is needed to close the hole.

Tetralogy of Fallot occurs in approximately five of every 10,000 infants and accounts for about 10% of all congenital heart diseases. It occurs equally in boys and girls. Before surgical advances made correction possible, about one-third of these children died in infancy.

Khalil A. et. al., (2003) examined thousand nine hundred and sixty four consecutive live births weighing more than 500 g and more than 28 weeks of gestation were subjected to a thorough clinical examination within 24 hours of birth in India. Those suspected of having congenital heart disease were followed up every four to six weeks for a period of 6 to 18 months. Forty three of 10,964 infants had congenital heart disease, that is 3.9/1000 live births. Incidence of congenital heart disease was higher in pre-terms as compared to full term live births. Twenty eight per cent of the infants with congenital heart disease had other associated somatic anomalies, Down's syndrome (9.3%)., patent ductus arteriosus (41.9%) and ventricular septal defects (34.9%), were the commonest lesions with an incidence of 1.6 and 1.4/1000 live

births, respectively. During follow up of 6-18 months, 34.9% of the infants with congenital heart disease died. The diagnosis of congenital heart disease was confirmed at autopsy in 20% of the death.

Chadha SL. et. al., (2001) carried a community based survey of congenital heart disease on a random sample of 11,833 children below 15 years in Delhi, India. Out of the examined sample, 50 were found suffering from congenital heart disease, giving an overall prevalence of 4.2/1000 (4.6/1000 in boys and 3.7/1000 in girls). The lesions in order of frequency were ventricular septal defect (46%), atrial septal defect (18%), patent ductus arteriosus (14%), Fallot's tetrology (10%), aortic stenosis (4%), and pulmonary stenosis (4%). The prevalence rate was higher in the age group 0-4 years and 5-9 years in boys whereas it was higher in adolescent (10-14 years) girls.

Thakur JS. (1995) screened 15,080 school going children for the prevalence of congenital heart disease and rheumatic fever/rheumatic heart disease. The prevalence of congenital heart disease was found to be significantly more in female (3.3 per thousand) than in male children. Three (8.8%) cases had a family

history of congenital heart disease. Rheumatic fever/rheumatic heart disease was found to have a significant prevalence among cases with congenital heart disease (8.8%) as compared to children without congenital heart disease. The findings suggest the need for screening of family members of those suffering from congenital heart disease and that special attention be paid to the occurrence of rheumatic fever/rheumatic heart disease in cases of congenital heart disease.

Andersen S. (1994) identified that, 145 children with congenital heart disease were detected among 14,194 live-born children from first January 1987 to 31 December 1990 in India. This represents an incidence of 10.2 per thousand live-born children. The children were followed for six to 42 months. Ventricular septal defect was detected in 71 (49%) cases. Isolated ventricular septal defect was found in 56 (39%) cases, the muscular type being the most frequent. Other congenital defects were found in 28 cases (19%), either as chromosome aberrations, syndromes or extracardiac malformations. 13 (9%) children died. None had constant symptoms of congestive heart failure by the end of the study. 34 (23%) cases were referred from mother and child clinics. eight (5.5%) cases were detected prenatally.

STATEMENT OF THE PROBLEM

EFFECTIVENESS OF NURSING CARE ON CHILDREN WHO UNDERWENT CARDIAC SURGERY.

OBJECTIVES:

1) to assess the health status on children who underwent cardiac surgery.
2) to evaluate the effectiveness of nursing care on children who underwent cardiac surgery.
3) to find out the correlation between demographic variables with the effectiveness of nursing care on children who underwent cardiac surgery.

OPERATIONAL DEFINITION

Effectiveness

It refers to Excellency in nursing care and to promote health status of the children who underwent cardiac surgery which were assessed and evaluated by modified tool.

Nursing Care

The post operative nursing care includes monitoring of vital parameters like ventilator support, central venous pressure,

electrocardiograph, draining, urine output, saturated pressure of oxygen, vital signs and providing of personal hygiene, back care, dressing, chest physiotherapy, suture removal, mobilization, exercises, nebulization and administration of medication like dopamine, nitroglycerine infusion and blood transfusion.

Children

Children in the age group of birth to 16 years with congenital heart diseases, who have underwent surgery and staying for five days in pediatric intensive care unit.

Cardiac Surgery

Modified blalock taussing shunt, transatrial dacron patch closure of ventricular septal defect, tunneling of left ventricle to aorta, dacron patch closure of artrial septal defect, kawashima repair, pericardial patch closure of sinus venous, pulmonary artery banding, bidirectional glenn shunt and arterial switch procedure.

LIMITATIONS

1. The sample size was limited to 30 children.
2. The period of study was limited to six weeks.
3. The finding of study cannot be generalized

ASSUMPTION

Daily assessment of the children's enables a nurse to gain thorough knowledge about progress in children health condition and will provide guideline for the nurse to implement a need based care.

Nursing care given will enhance in the prevention of complication. Effective postoperative nursing care improves the clinical picture and avoids the infection and provokes the prognosis.

PROJECTED OUTCOME

Nursing intervention for children who underwent cardiac surgery will prevent complications and will improve the quality of life and health status of children. The study will help to assess the effectiveness of nursing care of children who underwent cardiac surgery. The best nursing care provided would decrease the cost of health care by minimizing the stay in hospital.

CONCEPTUAL FRAME WORK

Conceptual frame work is the back bone of the research study. It serve as a mode for the researcher to show his study evidence based.

The conceptual frame work utilized in this research study was W.B. Kenney's open system model which accommodates elements such as input, throughput and output which are used in the properiod (pretest) to till the cons period (posttest) it was modified and used for the children with congenital heart disease.

It entails

- Input
- Throughput
- Output

It covers the assessment tool utilized to check the demographic variable of children used the physiological changes that occurs in children who underwent cardiac surgery. It also highlight the nursing care plan that was planned prior to the implementation phase.

INPUT

It entails the nursing care provided from the day of surgery of the child till transfer of the child to post operative ward, the nursing care provided are monitoring of vital parameters, pain relieving measures, promote rest and comfort, maintenance of hydration and nutrition, meeting hygienic needs, change of position, prevention of infection, dressing, suture removal , chest physiotherapy and exercises, nebulization, early ambulation, maintenance of normal bowel pattern, maintenance of normal urinary elimination, administration of medication and health education.

THROUGHPUT

It entails the ongoing progress of the child health status. After an effective nursing care the childs health status was improved from severe to normal.

OUTPUT

The nursing care provided for the children who underwent cardiac surgery was effective. The improvement in health status was evaluated in the form of normal health condition, moderate health deterioration and severe health deterioration.

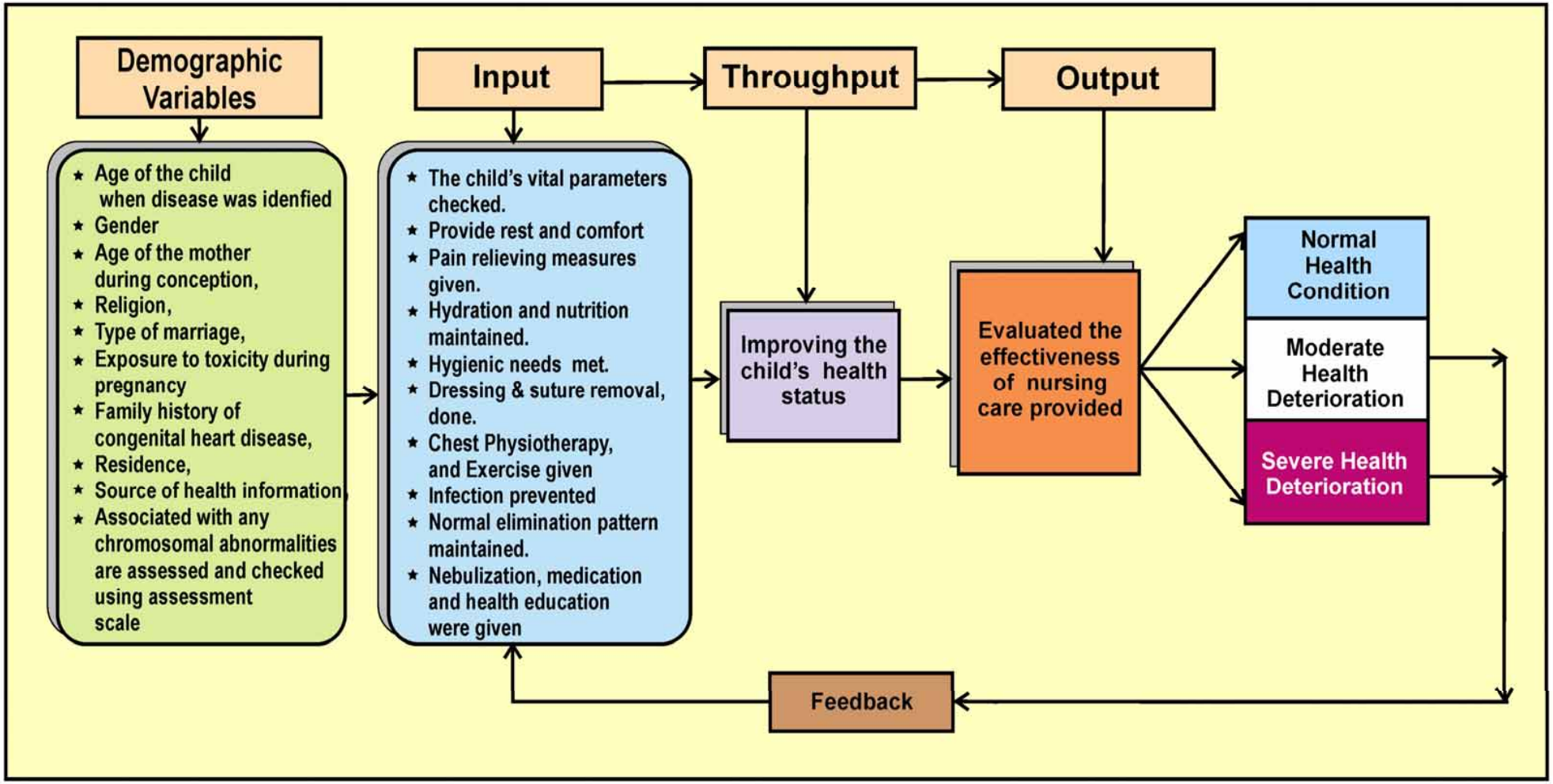

Fig 1.1 CONCEPTUAL FRAME WORK BASED ON J.W. KENNEY'S OPEN SYSTEM MODEL (1999)

CHAPTER - II

REVIEW OF LITERATURE

Review of literature helps the investigator to analyze the existing literature to generate research questions, to identify what is known about the topic and to describe methods of enquiry used in earlier work including their success and short comings. A review of literature relevant to present study was aimed at identifying the knowledge, attitude and practice of school children regarding oral care.

Part – I : Literature related to causes of congenital heart disease.

Part – II : Literature related to diagnostic evaluation of congenital heart disease.

Part – III : Literature related to cardiac surgery.

Part – IV : Literature related to nursing care who underwent cardiac surgery.

REVIEW OF LITERATURE REGARDING CAUSES OF CONGENITAL HEART DISEASE

Usually we do not know the cause of congenital heart defects, but we do know of some conditions that increase a child's risk of being born with a heart defect.

They include

- Congenital heart disease of the baby's mother or father.
- Congenital heart disease of the baby's brother or sister.
- Diabetes in the mother.
- German measles, toxoplasmosis (an infection that is passed through contact with cat feces), or HIV infection in the mother.
- The mother's use of alcohol during pregnancy.
- The mother's use of cocaine or other drugs during pregnancy.
- The mother's use of certain over-the-counter and prescription medicines during pregnancy.

Even if one or more of these conditions may present, it does not mean that the baby born with a heart defect. Babies can also

be born with heart defects even when none of these conditions are present. Rarely can families predict or prevent congenital heart defects. Of course, every pregnant woman needs to do all she can to ensure the health of her baby, like avoiding alcohol, drugs, and exposure to the German measles and environmental toxins.

B.Marino (2009) noted the increasing role of genetic factors in the etiology of congenital heart defects is shown by the high frequency of genetic syndromes and extracardiac malformations in these patients. The correlation between anatomic cardiac patterns and some genetic anomalies (trisomy, deletion, mutation) suggests that specific morphogenetic mechanisms put in motion by gene(s) can result in a specific cardiac phenotype.

Vaidyanathan B. et. al., (2008) identified determinants of malnutrition in children with congenital heart disease and examine the short-term effects of corrective intervention. 476 consecutive patients undergoing corrective intervention were included. There were 16 deaths .The three month follow-up data of 358 (77.8%) of remaining 460 patients were analyzed. Follow-up showed a significant improvement from baseline, irrespective of the cardiac diagnosis. They concluded that malnutrition is common in children

with congenital heart disease. Corrective intervention results in significant improvement in nutritional status on short-term follow-up.

El-Rassi I. et. al., (2007) analyzed the role of parental consanguinity and/or maternal age on the occurrence of congenital cardiac anomalies in infants with Down's syndrome. Congenital cardiac anomalies were found in 54.2% of babies with Down's syndrome. The risk of congenital cardiac anomaly was greater when maternal age was equal or below 32 years. They concluded that in children with Down's syndrome, the risk of congenital cardiac anomalies was not associated with the parents consanguinity. Maternal age above 32 years seem to be associated with a lesser occurrence of congenital cardiac anomaly in children with Down's syndrome.

Duin YR. et. al., (2005) investigated microdeletion of chromosome 22q11 is an epidemiologically important cause of congenital heart disease, we studied 25 cases with congenital heart disease phenotypes. Venous blood samples were tested by fluorescence in situ hybridization for micro deletion of 22q11. Among 23 cases with simple congenital heart disease, 19 were

shown not to have micro deletion of 22q11 and the other 4 cases were shown to have 22q11 micro deletion. Micro deletion of 22q11 was found in two cases with Tetralogy of Fallot accompanied by multiple malformations. The results suggested that microdeletion of 22q11 was associated with congenital heart disease .

Reynolds et. al., (2005) recommended for counseling the family in which a parent has congenital heart disease. The risk is much greater if it is the mother rather than the father who has the heart defect. The updated figures for recurrence risks in sibs have been revised, but are not greatly changed. Our central tenet in counseling is to base risk projections on the genetic and teratogenic history in the individual family and pregnancy.

Rubens Figueroa J. et. al., (2004) determined the incidence, type of heart disease and clinical course in patients with Down syndrome, and to compare the findings with data from other countries. Down syndrome is a disease caused by trisomy of chromosome 21.Frequency in the general population is about 1%. Cardiac malformation is the main cause of mortality in the first two years of life. They mentioned that 275 children with Down syndrome, 160 had congenital heart disease. In contrast to the

data from other countries, only 14 (8%) had atrioventricular septal defect. 25 (15%) died from sepsis and cardiogenic shock.

Strauss MD. et. al., (2004) reviewed the incidence and importance of congenital heart disease the reasons that investigation of causative mechanisms for human congenital heart disease has been slow, and the limitations of the multifactorial theory for the etiology of congenital heart disease .Concluded that (1) human congenital heart disease is frequently due to single-gene defects and that even sporadic defects may arise from a single-gene abnormality; (2) a common genetic defect may cause several apparently different forms of congenital heart disease ; (3) elucidation of the genetic basis of congenital heart disease provides clues to normal cardiovascular developmental biology; (4) the same cardiac malformation can be caused by mutant genes at different loci; and (5) interactions of clinical investigator with basic scientists should allow more rapid progress in defining the genetic basis of congenital heart disease .

Nora JJ. (2003) enumerated the risk of recurrence of a congenital cardiovascular malformation in a child having one parent with congenital heart disease has been determined for each

of the seven most common anomalies presently compatible with survival to reproductive age. The range of risk is 2.5% to 4.3% depending on the lesion. The cardiovascular abnormality occurring in the child was most often the same as in the parent or was a closely related variant of it.

REVIEW OF LITERATURE RELATED TO DIAGNOSTIC EVALUATION OF CONGENITAL HEART DISEASE

Zhang SR. et.al., (2009) studied the values of brain natriuretic peptide and N-terminal pro-brain natriuretic peptide in the evaluation of cardiac function in children with congenital heart disease. Plasma brain natriuretic peptide and N-terminal pro-brain natriuretic peptide contents in the congestive heart failure group were significantly higher than those in the non-congestive heart failure group. Both brain natriuretic peptide and N-terminal pro-brain natriuretic peptide can be useful in assessment of cardiac function and diagnosis of congestive heart failure in children with congenital heart disease.

Kadar K. et. al., (2008) assessed tissue Doppler imaging efficiency by measuring the right ventricular tricuspid anulus systolic velocity and early diastolic velocity (E') were measured

from Doppler inflow the E wave peak velocity, and the E/E' ratio was calculated. The noninvasive evaluation of right ventricular function is difficult, especially in postoperative complex congenital heart disease due to the special right ventricular geometry. Tissue Doppler imaging for right ventricular function analysis is recommended in congenital heart disease and also proposed in addition to other methods.

Chen SJ. et. al., (2007) evaluated electron beam computed tomography for recognition of coronary artery patterns in children with congenital heart diseases. Numerous aberrant patterns were clearly identified on the electron beam computed tomography images. Overall diagnostic accuracy for all disease groups was 82.7%. The diagnostic accuracy of the coronary arterial anatomy by electron beam computed tomography increased with older age, and was more than 90% in individuals aged over three months. electron beam computed tomography is effective for identification of the coronary anatomy of children with specific congenital heart diseases, except for neonates and small infants less than three months of age.

Sebastian Leschka (2007) demonstrated that although echocardiography is the imaging method of choice for diagnostic, preoperative, and postoperative evaluation of congenital heart disease, computed tomography is a helpful complementary imaging modality, particularly for postoperative evaluation. A thorough understanding of the normal anatomy and the morphologic features of congenital heart diseases is a prerequisite for choosing the optimal computed tomography technique and achieving an accurate diagnosis.

Makarenko VN. et. al., (2006) aimed to evaluate the possibility to use computed tomography techniques for the diagnosis of congenital heart disease. Babies were examined under medicamentous sedation. It provided data on the formation of all segments and intercommunications of the heart, mutual localization of its cavities and major vessels, permitted to perform morphometry of selected cardiac structures and detect anatomic defects. The informative and diagnostic value of methods for comprehensive evaluation of the heart and mediastinum in patients with congenital heart disease was assessed.

Quak P. et. al., (2006) said that three dimensional imaging is particularly useful in the diagnosis of complex congenital heart disease, in the preparation of complex investigations of interventional cardiac catheterisation and the postoperative evaluation of surgical repair. The management of congenital cardiovascular malformations is a diagnostic challenge. It requires accurate assessment of the intra- and extra-cardiac malformations. Three-dimensional imaging by the multislice computed tomography scanner is now a routine investigation for congenital heart disease, complementary to echocardiography and increasingly an alternative to conventional angiography.

Smevik B. et. al., (2006) shown magnetic resonance imaging to be valuable in defining cardiac anatomy in a variety of cardiac abnormalities. The article describes the technique and results of magnetic resonance in 32 children with congenital heart disease. Magnetic resonance clearly depicts the anatomy of the great vessels, and may be used for the evaluation of palliative systemic-pulmonary artery shunts. In postoperative controls, Magnetic resonance may replace or postpone angio-cardiography.

Gutberlet M. et. al., (2003) assessed the new method of 3-dimensional echocardiography in comparison to the "gold standard" Magnetic Resonance Imaging as to its ability to calculate left ventricular volumes in patients with congenital heart disease. Concluded that in patients with an abnormal left ventricular configuration due to congenital heart disease, the new method of 3D-echocardiography is sufficient for volume calculations in preselected patients. The high intraobserver variability is still a limitation of transthoracic 3D-echocardiography in comparison to magnetic resonance imaging.

REVIEW OF LITERATURE RELATED TO CARDIAC SURGERY

Buniatian AA. et. al., (2008) mentioned the results of the employment of glukagon in 40 patients operated upon under extracorporeal circulation for acquired and congenital heart diseases are presented. Instrumental studies of the haemodynamics in 11 cases demonstrated that glukagon in a dose of 3 mg produced in most cases an increase of the cardiac output and stroke volume, and of the systolic index by over 20%, with the heart rate increasing insignificantly. Clinical observations conducted in 29 patients demonstrated a high efficacy of glukagon

in the management of acute cardiac failure and low cardiac output syndrome in the early post-perfusion period.

Champsaur G. et. al., (2006) performed complete corrections of complete atrioventricular canal in children aged from four months to eight years. In 35 patients the "composite double patch" technique was used, consisting of closure of the interventricular septal defect with a dacron patch, followed by closure of the ostium primum with a pericardial patch. The mitral cleft was left intact in the last six operations. Only one early death was recorded among the last 15 children operated upon. Two reoperations were performed: one within one month of the first operation.

Seike Y. et. al., (2006) studied a three year-old boy suffered from the poor body weight gain under the diagnosis of partial anomalous pulmonary venous connection to the high portion of the superior vena cava associated with ventricular septal defect and intact atrial septum. He successfully underwent surgical repair with Williams method using right atrial flap out and ventricular septal defect patch closure. Postoperative course was uneventful and echocardiography demonstrated no obstruction at the both routes

of neo-superior vena cava and neo-right upper pulmonary venous return.

Yamauchi H. et. al., (2006) studied patient who had received balloon atrioseptotomy and B-T shunt operation previously experienced recurrent episodes of supraventricular tachycardia, and was refractory to medical treatment since the age to 3. Rastelli's operation and division of posterior septal Kent was simultaneously performed successfully. They concluded that the division of Kent bundle should be simultaneously performed with operative reconstruction in patients with congenital heart disease on postoperative care for supraventricular tachycardia.

Kohman L. (2005) said that modified Blalock-Taussig shunt provides excellent palliation for patients with cyanotic heart disease and may be the optimal shunt for infants less than three months old. The result was there were no sudden failures and all shunts remained patent. Univariate analysis revealed that age less than three months and weight less than 3.6 kg were risk factors predictive of earlier shunt failure.

Nakatsu T. et.al., (2005) found child with coarctation of the aorta, ventricular septal defect, atrial septal defect, and severe pulmonary hypertension underwent one-stage repair consisting of patch closure of ventricular septal defect and coarctation repair. Inhalation of nitric oxide was commenced to treat residual severe pulmonary hypertension on the day of operation. Oral sildenafil citrate was commenced on the day one and nitric oxide was gradually weaned off on the day three. Prophylactic use of oral sildenafil citrate for pulmonary hypertension might be an useful alternative to shorten the duration of nitric oxide therapy and intensive care unit stay in the selected patients after congenital open heart surgery.

Silveira WL. et. al., (2005) analyzed the initial results of the use of an organic tubular graft for systemic-pulmonary anastomoses. The tubular L-D-Hydro graft proved to be promising for performing systemic-pulmonary shunt as an alternative for the inorganic products available in the market, however, we need a greater number of implantations and late follow-up for definitive assessment.

Takiguchi M. et. al., (2005) studied a child, who had a diagnosis as a Taussig-Bing anomary, underwent an original Jatene procedure two months after birth. The child was diagnosed to have the muscular multiple ventricular septal defects and pulmonary stenosis after Jatene procedure. The multiple ventricular septal defects was Swiss-cheese type and was large from the proximal of the infundibular septum to the apex and posterior of the septum. Postoperative cardiac function was uneventful regardless of the very large patches placed at the ventricular septum. This technique for the closure of the large Swiss-cheese type multiple ventricular septal defects can be considered to be very effective.

Jarry JM. et. al., (2004) published the correction of Tetralogy of Fallot in the first year of life, the authors preferred palliative surgery for this group. They argued that with early correction, surgeons are obliged to put more transannular patches which result in more pulmonary insufficiency cases, and that the mortality in this age group is still very high in some publications. They have also compared the percentage of low cardiac output syndrome after correction and found that children with a previous S-P shunt have smoother post-operative course. Finally they think

that it is possible to obtain a global mortality around seven percentage for the two stages approach and that this kind of surgery is technically easier than early correction and must be very useful for the majority of cardiac centers interested in congenital heart disease.

Shinonaga M. et. al., (2003) assessed a boy who had typical tetralogy of Fallot with mild cyanosis was referred to us. Preoperative echocardiogram revealed that in addition to the tetralogy of Fallot morphology, an abnormal piece of tissue attached to the right side of the ventricular septum was floating and obstructing flow through the ventricular septal defect in systole. This tissue was used as a suture anchorage for patch closure of the defect. Preoperative echocardiography is useful to detect such flaps and early surgical correction should be done to prevent right ventricular failure resulting from right ventricular pressure overload.

Uchida T. et. al., (2003) proposed and performed a new method of pulmonary artery plasty using large rectangular heterogeneous pericardium, by which pulmonary artery could be widely enlarged from the pulmonary trunk to periphery of the

stenosis. Patients received Rastelli operation with pulmonary artery plasty simultaneously. Rastelli operation was performed using composite graft consisted of valved heterogeneous pericardial roll and knitted Dacron graft. They considered that the pulmonary artery plasty with rectangular heterogeneous pericardial patch is an effective surgical procedure to avoid restenosis compared with conventional pericardial patch enlargement or balloon pulmonary artery plasty.

Kuroczynski W. (2002) suggested the Fontan procedure has been offered to patients with a variety of complex cyanotic heart diseases and has resulted in decreased mortality. This review summarizes the development and modifications of the Fontan procedure. The advances in preoperative, intraoperative and postoperative patient management have resulted in greatly improved survivals for even the most complex congenital defects. Over the past three decades, the survival of infants with critical congenital heart defects has increased to 90%

Mein J. et. al., (2002) concluded that atrio vetricular septal defect and tetralogy of fallot can be corrected using the two-patch technique and closure of the ventricular septal defect through a

combined approach using a right ventriculotomy and right atriotomy. Routine closure of the commissure of the left portion of the atrioventricular valve results in a low incidence of regurgitation. Good functional result can be achieved in most patients postoperatively.

Villaizán C. et.al., (**2002)** conducted cardiac transplantation is an acceptable therapeutic alternative for cardiac diseases refractory to other forms of management in adults as well as in infants and children. Heart transplantation provides durable therapy for congenital and myopathic heart disease in infants and children with an excellent quality of life.

Yuang Y. et. al., (2001) summarized the surgical results of truncus arteriosus in children. Children with truncus arteriosus are still indicated for complete correction. Autologous pericardial valved dacron conduit has excellent long-term outcomes. Correcting truncal valve insufficiency, repairing ventricular septal defect, avoiding large pressure gradient across conduit and shortening time are keys to improve the survival rate of patients and achieve excellent long-term outcome.

REVIEW OF LITERATURE REGARDING NURSING CARE WHO UNDERWENT CARDIAC SURGERY

Sharma S. (2009) demonstrated that patients who have undergone the Fontan operation can safely undertake exercise training and that this results in an improvement in aerobic capacity. These findings suggest that aerobic training could be useful in the long-term management of these patients to optimize their cardiovascular fitness for more active lives.

Asano K. (2009) examined relationships among nurses' knowledge and attitudes about children's pain relief, nurses' abilities to overcome barriers to optimal pain management, nurses' analgesic practices, and pain levels of hospitalized children. Significant positive relationships were found between nurses' analgesic administration and children's pain, and between nurses' years of practice with children and nurses' abilities to overcome barriers to optimal pain management. Nurses administered a mean of 37.9% of available morphine and means of 36% to 54% of recommended amounts of morphine, acetaminophen, and codeine.

Stinson J. (2008) appraised all systematic reviews on the effectiveness of acute procedure-related pain management in

hospitalized children. They concluded that there is growing evidence of rigorous evaluations of both pharmacological and non pharmacological strategies for acute procedure-related pain in children; however, the evidence underlying some commonly used strategies is limited. The present review will enable the creation of a future research plan to facilitate clinical decision making and to develop clinical policy for managing acute procedure-related pain in children.

Meibner J. (2007) evaluated hemodynamic effects and the cardiac function after very early extubation within the first six hours after open-heart surgery in children. Very early extubation in children after open-heart surgery does not promote cardio depressive effects. It is a safe procedure that helps to reduce the unnecessary and prolonged mechanical ventilation of children after cardiopulmonary bypass surgery.

Goyal U. et. al., (**2006)** studied efficacy of nitroglycerin inhalation with congenital heart disease. Inhaled nitroglycerin significantly decreases systolic, diastolic and mean pulmonary artery pressure as well as pulmonary vascular resistance index without affecting systemic haemodynamics, and thus can be used

as a therapeutic modality for acute reduction of pulmonary arterial hypertension in children with congenital heart disease.

Jonathan Rhodes (2006) documented the acute benefits of cardiac rehabilitation in children with congenital heart disease. The cardiac rehabilitation patients' exercise function did not change significantly over the six to nine month period after the completion of the cardiac rehabilitation program. In patients with congenital heart disease, cardiac rehabilitation produces significant, sustained improvements in exercise function, behavior, self-esteem, and emotional state.

Orita H. (2005) assessed the incidence of postoperative infections in relation to age, the duration of surgery and antibiotic prophylaxis, and examined the causative organisms. Patients who underwent an operation of over eight hours duration also had a significantly higher incidence compared to those whose operation time was less than four hours. There was no significant difference in the incidence of postoperative infection between patients given or not given preoperative prophylaxis.

Chantepie (2004) used the palivizumad for the prevention of respiratory syncytial virus infections in children with congenital

heart disease. Prophylaxis with palivizumab is recommended in high-risk infants for respiratory complications after RSV infection: infants under I year old; left to right shunt with cardiac failure, failure to thrive, pulmonary hypertension or bronchial compression. Decisions regarding prophylaxis with palivizumab should be made in collaboration with the pediatric cardiologist in order to optimize the cost-benefice ratio, on the basis of the degree of physiologic cardiovascular compromise.

Shen YZ. (2002) studied the management of respiratory infection after open heart surgery in 370 consecutive cases are presented in this paper. The incidence of postoperative respiratory infection was 3.8% . There was atelectasis of the lung in three, pneumonia in six and acute suppurative bronchitis in five cases. Among the six patients with postoperative pneumonia, one died of sepsis and another died of consolidation of the lung. The remaining 12 attained uneventful recovery after reasonable treatment with antibiotics, expectorant, oxygen therapy, inhalation therapy, bronchial lavage and aspiration.

Varma J. (2002) tested hypothesis intratracheally administered furosemide also increases respiratory compliance in

children after cardiac surgery, and investigated whether furosemide has a topical or systemic action. They concluded that intratracheally applied furosemide improves static compliance in infants and toddlers with compromised lung mechanics after cardiac surgery. Demonstrated that furosemide is absorbed from the lung and has a systemic effect within 15 min after its intratracheal instillation.

Patrick (2003) assessed whether respiratory physiotherapy prevents pulmonary complications after cardiac surgery. The usefulness of respiratory physiotherapy for the prevention of pulmonary complications after cardiac surgery remains unproved. Large randomized trials are needed with no intervention controls, clinically relevant end points, and reasonable follow up periods.

CHAPTER – III

METHODOLOGY

This chapter describes the methodology followed to assess the effectiveness of nursing care on children who underwent cardiac surgery in pediatric ward at Life Line Hospital, Perungudi, Chennai.

This chapter deals with research design, setting, population, sampling size, sampling techniques, inclusive and exclusive criteria for selection of sample, description of tools and data collection.

RESEARCH DESIGN

Evaluative research design was adopted to assess the effectiveness of nursing care on children who underwent cardiac surgery.

SETTING

The study was conducted in pediatric ward at Life Line Hospital, Perungudi, Chennai.

POPULATION

The children in the age group of birth – 16 years, those who underwent cardiac surgery, staying for five days in pediatric intensive care unit.

SAMPLE SIZE

Total number of sample was 30 children who underwent cardiac surgery, staying for five days in pediatric intensive care unit, at Life Line Hospital, Perungudi, Chennai.

SAMPLING TECHNIQUE

Probability Sampling method was adapted, simple random sampling technique was employed for sample selection.

CRITERIA FOR SAMPLE SELECTION

Inclusion criteria

- Children who underwent cardiac surgery at Life Line Hospital, Perungudi, Chennai.
- Children who were co-operative.
- Children in the age group of 0 – 16 years.

Exclusion criteria

- Children who were under medical management.

INSTRUMENT

Details of tool used in this study are given below.

Section I	:	Proforma for demographic variables.
Section II	:	Ongoing assessment scale.
Section III	:	Observation checklist.

DATA COLLECTION

The study was conducted in Life Line Hospital, Perungudi, Chennai. The data was collected for a period of six weeks by using the prepared tools. The tools were develop based on the objectives of the study and through review of literature.

CHAPTER - IV

DATA ANALYSIS AND INTERPRETATION

This chapter deals with description of the tool, report of pilot study, reliability informed consent, data collection procedure, scoring interpretation, data analysis plan and results and statistical method.

DESCRIPTION OF THE TOOL

Details of tool used in this study are given below.

1. Proforma for demographic variables.
2. Ongoing assessment scale.
3. Observation checklist.

SECTION – I PROFORMA FOR DEMOGRAPHIC VARIABLES

In this section, information on the demographic variables such as age of the child, when disease was identified, gender, age of the mother during conception, religion, type of marriage, exposure to toxicity, family history, residence, associated chromosomal abnormalities and source of health information are included.

SECTION – II ONGOING ASSESSMENT SCALE

This section consists of twenty components regarding the health condition of the children who underwent cardiac surgery, each components carried maximum of four, minimum score of one and the total score of eighty. Based on the information data are classified as follows.

< 40 – Normal health condition.

40 - 60 – Moderate health deterioration.

>60 – Severe health deterioration.

After collecting the data, the data were analyzed to find out the mean, percentage, standard deviation and of scores for children who underwent cardiac surgery.

SECTION – III NURSING CARE ON CHILDREN WHO UNDERWENT CARDIAC SURGERY

In this section, check list for nursing care was given to the children. It consisted of monitoring of vital parameters, pain relieving measures, promote rest and comfort, maintenance of hydration and nutrition, meeting hygienic needs, change of position, prevention of infection, dressing, suture removal , chest physiotherapy and exercises, nebulization, early ambulation, maintenance of normal bowel pattern, maintenance of normal

urinary elimination, administration of medication and health education.

REPORT OF THE PILOT STUDY

Pilot study was conducted to find out the effectiveness of nursing care of children who underwent cardiac surgery at Life Line hospital Perungudi, Chennai, for a period of ten days to find out the feasibility of the study and to plan for data analysis on the basis of pilot study the instrument and the interventions were modified and refined. The pilot study subjects were excluded from the original study.

The pre assessment was done by using the planned ongoing assessment score and the nursing care was given by using rating scale for the children who underwent cardiac surgery after five days the children status was evaluated and results were analyzed based on the score. The data was analyzed by using paired ‘t’ test, Calculated values is more than tabulated value. So effectiveness of nursing care on children who underwent cardiac surgery is significant.

RELIABILITY AND VALIDITY

The assessment tool was developed by the investigator based on the review of literature, which was evaluated and accepted by experts of the research committee. Reliability was established by test and retest method. The pre assessment or pre test was done first time for five samples and reassessment or post assessment was done after a week. In both cases responses had differ and some progress was found. The test was measuring the same attribute the tool was found to reliable one. Validity was obtained from the research scholar.

INFORMED CONSENT

The dissertation committee prior to the pilot study approved the research proposal. Permission was obtained from the head of the child health nursing department and from the Life Line Hospital, Perungudi, Chennai. Permission was obtained from the medical Officer and Staff Nurse in charge. The oral consent from each child's mother was obtained before starting the data collection. Assurance was given to mother's that confidentiality would be maintained.

DATA COLLECTION PROCEDURE

The demographic data was collected from the mothers who were co-operative and accepted to take their children as the subjects of the study and health condition data was collected from the children. The data collection was done on the assessment day after getting the demographic data from the mothers of the children were selected for the study. Assessment was done with the help of the prepared tool. Nursing interventions were carried out from 8.00 A.M to 4.00 P.M on all days during the study period and on the fifth day the care was evaluated with the ongoing assessment tool.

SCORE INTERPRETATION

The obtained data were interpreted by the following procedure

$$\text{Score interpretation} = \frac{\text{Obtained score}}{\text{Total Score}} \times 100$$

Maximum Score = 80

Minimum Score = 20

DATA ANALYSIS PROCEDURE

The descriptive statistical analysis method was used to find out the mean, standard deviation and percentage of the score. The paired ‘t’ test and correlation test were adopted and interpreted with each and every score.

STATISTICAL METHODS

Sl. No.	Data Analysis	Methods	Remarks
1.	Descriptive analysis	The total number of score, mean, percentage and standard deviation.	To describe the demographic variables of the children who underwent cardiac surgery and to assess the effectiveness of nursing care of children who underwent cardiac surgery.
2.	Inferential analysis	Paired 't' test Correlation test	To compare the health condition of the children on first and fifth day. To analyse the correlation between selected demographic variables and effectiveness of nursing care on children who underwent cardiac surgery.

Section – A

Frequency and percentage distribution of the demographic variables of children who underwent cardiac surgery.

Section – B

Frequency and percentage distribution of assessment and evaluation score of children who underwent cardiac surgery.

Section – C

Mean and standard deviation of assessment and evaluation scores of children who underwent cardiac surgery.

Section – D

Improvement score mean and standard deviation of assessment and evaluation score for effectiveness of nursing care on children who underwent cardiac surgery.

Section – E

Correlation between demographic variables and effectiveness of nursing care on children who underwent cardiac surgery.

SECTION - A

TABLE - 4.1 FREQUENCY AND PERCENTAGE DISTRIBUTION OF DEMOGRAPHIC VARIABLES OF CHILDREN WHO UNDERWENT CARDIAC SURGERY

N = 30

Sl. No.	Demographic variables	Frequency	Percentage
1.	**Age of the child when disease was identified**		
	0 – 4 years	4	13.3
	4 – 8 years	9	30.0
	8 – 12 years	7	23.4
	12 – 16 years	10	33.3
2.	**Gender**		
	Male	17	56.6
	Female	13	43.4
3.	**Age of the mother during conception**		
	18 – 22 years	10	33.3
	23 – 27 years	10	33.3
	28 – 32 years	6	20.0
	above 32 years	4	13.4
4.	**Religion**		
	Hindu	22	73.4
	Christian	3	10.0
	Muslim	5	16.6
5.	**Type of Marriage**		
	Consanguineous	20	66.6
	Non- consanguineous	10	33.4
6.	**Exposure to toxicity during pregnancy**		
	Yes	5	16.6
	No	25	83.4
7.	**Family history of Congenital heart diseases**		
	Yes	3	10.0
	No	27	90.0
8.	**Residence**		
	Rural	19	63.4
	Urban	11	36.6
9.	**Source of health information through**		
	Mass media	6	20.0
	Health personnel	19	63.4
	Friends and relatives	5	16.6
10.	**Child associated with any chromosomal abnormalities**		
	Yes	3	10.0
	No	27	90.0

Table 4.1 reveals that out of 30 children four (13.3%) were between the age of 0 – 4 years, 10(33.3%) were between the age of 12-16 years when the disease was identified. 17(56.6%) were male children and 13(43.4%) were female children. 10 (33.3%) mothers were between the age of 18 – 22 years and four (13.4%) were above the age of 32 Years during conception. 22 (73.4%) were Hindu, three (10%) were Christians. 20 (66.6%) were consanguineous marriage and 10(33.4%) non-consanguineous marriage, five (16.6%) were exposed to toxicity during pregnancy and 25 (83.4%) were not exposed to toxicity. Regarding family history three (10%) children has family history of congenital heart disease and 27 (90%) had no family history of congenital heart disease. 19 (63.4%) were staying in rural and 11(36.6%) were staying in urban. 19(63.4%) have got health information from health personnel and five (16.6%) have got from friends and relatives 27 (90%) was not associated with any chromosomal abnormalities.

SECTION- B

TABLE - 4.2 FREQUENCY AND PERCENTAGE DISTRIBUTION OF ASSESSMENT AND EVALUATION SCORE OF CHILDREN WHO UNDERWENT CARDIAC SURGERY

N = 30

Health status	Assessment		Evaluation	
	N	%	N	%
Normal health condition	--	--	30	100
Moderate health deterioration	1	3.4	--	--
Severe health deterioration	29	96.6	--	--

Table – 4.2 reveals the progress in health condition of the children who underwent cardiac surgery. Among 30 children one (3.4%) was in moderate health deterioration and 29(96.6%) were in severe health deterioration on the assessment day. Among 30 children 30(100%) had normal health condition on evaluation day. It shows the nursing care was effective at $p < 0.01$ level.

SECTION - C

TABLE - 4.3 MEAN AND STANDARD DEVIATION OF ASSESSMENT AND EVALUATION SCORES OF CHILDREN WHO UNDERWENT CARDIAC SURGERY

N = 30

	Mean	Std. Deviation	Confidential interval
Assessment	64.2	2.54	65.33 – 63.07
Evaluation	28.13	2.14	29.09 – 27.12

Table – 4.3 reveals that the over all mean of children who underwent cardiac surgery was 64.2 with the standard deviation of 2.54 on the assessment day and the mean was 28.13 with the standard deviation of 2.14 on the evaluation day.

SECTION - D

TABLE - 4.4 IMPROVEMENT SCORE MEAN AND STANDARD DEVIATION OF ASSESSMENT AND EVALUATION SCORE FOR EFFECTIVENESS OF NURSING CARE ON CHILDREN WHO UNDERWENT CARDIAC SURGERY

N = 30

	Mean	Std. Deviation	Paired 't' test	Confidential interval
Improvement score	36	3.52	56.02	37.57 – 34.44

* P < 0.01 level significant

Table – 4.4 reveals the improvement between assessment score and evaluation score. The mean was 36 with standard deviation of 3.52. The calculated value (56.02) was greater than the table value (2.75). There was a significant improvement in the health status of children who underwent cardiac surgery in the evaluated day. It shows the nursing care was effective at $p<0.01$ level.

SECTION - E

TABLE - 4.5 CORRELATION BETWEEN DEMOGRAPHIC VARIABLES OF CHILDREN AND NURSING CARE ON CHILDREN WHO UNDERWENT CARDIAC SURGERY

N = 30

S.No.	Socio Demographic Variables	Assessment score				Evaluation score		r
		Severe health deterioration		Mild health deterioration		Normal health condition		
		N	%	N	%	N	%	
1	Age of the child when disease was identified							
	a. 0 – 4 years	3	10.0	1	3.4	4	13.3	
	b. 4 – 8 years	9	30.0	-	-	9	30.0	0.8*
	c. 8 – 12 years	7	23.3	-	-	7	23.4	(S)
	d. 12 – 16 years	10	33.3	-	-	10	33.3	
2	Gender							
	a. Male	17	56.6	-	-	17	56.6	0.3
	b. Female	12	40.0	1	3.4	13	43.4	(NS)
3	Age of the mother during conception							
	a. 18 – 22 years	9	30.0	1	3.4	10	33.3	
	b. 23 – 27 years	10	33.3	-	-	10	33.3	0.5*
	c. 28 – 32 years	6	20.0	-	-	6	20.0	(S)
	d. above 32 years	4	13.4	-	-	4	13.4	
4	Religion							
	a. Hindu	22	73.4	-	-	22	73.4	0.3
	b. Christian	2	6.6	1	3.4	3	10.0	(NS)
	c. Muslim	5	16.6	-	-	5	16.6	
5	Type of Marriage							
	a. Consanguineous	19	63.3	1	3.4	20	66.6	0.5*
	b. Non-consanguineous	10	33.4	-	-	10	33.4	(S)
6	Exposure to toxicity during pregnancy							
	a. Yes	5	16.6	-	-	5	16.6	0.2
	b. No	24	80.0	1	3.4	25	83.4	(NS)

S.No.	Socio Demographic Variables	Assessment score				Evaluation score		r
		Severe health deterioration		Mild health deterioration		Normal health condition		
		N	%	N	%	N	%	
7	Family history of Congenital heart diseases							
	a. Yes	2	6.6	1	3.4	3	10.0	0.2
	b. No	27	90.0	-	-	27	90.0	(NS)
8	Residence							
	a. Rural	18	60.0	1	3.4	19	63.4	0.2
	b. Urban	11	36.6	-	-	11	36.6	(NS)
9	Source of health information through							
	a. Mass media	5	16.6	1	3.4	6	20.0	
	b. Health personnel	19	63.4	-	-	19	63.4	0.4 (NS)
	c. Friends and relatives	5	16.6	-	-	5	16.6	
10	Child associated with any chromosomal abnormalities							
	a. Yes	3	10.0	-	-	3	10.0	0.2
	b. No	26	86.6	1	3.4	27	90.0	(NS)

S* - Significant

NS - Not Significant

Table – 4.5 reveals the correlation between demographic variables and the effectiveness of nursing care on children who underwent cardiac surgery. Statistically there was a significant correlation between the demographic variable such as age of the child when disease was identified, age of the mother during consumption and type of marriage.

CHAPTER – V

RESULTS AND DISCUSSION

The study was conducted to determine the effectiveness nursing care of children who underwent cardiac surgery. The study findings have been discussed in terms of the objectives of theoretical basis and hypothesis. A total number of 30 samples were selected for the study. The health condition of each and every children post operatively was assessed everyday. Based on the assessment the nursing care was planned and implemented for the children who underwent cardiac surgery.

The first objective was to assess the health status of children who underwent cardiac surgery table 4.2 revealed that among 30 children one (3.4%) was in moderate health deterioration and 29 (96.6%) were in severe health deterioration on the assessment day. Among 30 children overall mean was 64.2 with the standard deviation of 2.54 on the assessment day.

The second objective was to evaluate the effectiveness of nursing care on children who underwent cardiac surgery table 4.2 revealed that among 30 children all 30 (100%) had

normal health condition on evaluation day. Table 4.3 revealed that after giving nursing care on the evaluation day the overall mean was 28.13 with standard deviation of 2.14. The improvement score with the assessment and evaluation showed the mean of 36 with the standard deviation of 3.52. The calculated value was greater than the tabulated value. There was an improvement in health status of children who underwent cardiac surgery.

Nurses working in pediatric ward should assess the children and then plan for giving nursing care according to priority. Nursing care plays a significant role in protecting the children from the complications and also in the reduction of death after surgery.

The third objective is to correlate the demographic variables with effectiveness of nursing care on children who underwent cardiac surgery table-4.5 statistically there was a significant association between the nursing care and the demographic variables of children who underwent cardiac surgery such as disease identified at the age of, age of the mother during conception and type of marriage.

CHAPTER – VI

SUMMARY AND CONCLUSION

Evaluative research design was adopted to evaluate the nursing care of children with who underwent cardiac surgery. Individualized nursing care was provided to children those who met the inclusion criteria. The study was conducted at Life Line Hospital, Perungudi, Chennai. The simple random sampling technique was administered and sample size was determined as thirty.

Ongoing assessment was done with the rating scale prepared to analyse the health condition of the children who underwent cardiac surgery and standard nursing care plan was prepared to render care to promote rest and comfort, to maintain the vital parameter, monitoring of drain and output, maintenance of personal hygiene, chest physiotherapy and exercises, nebulization, early mobilization, suture removal, daily dressing, maintenance of hydration and nutritional status, prevention of spread of infection, administration of medication and health education regarding post operative diet and exercise. Nursing

care given for children who underwent cardiac surgery, promoted easy recovery postoperatively.

NURSING IMPLICATION

Nursing care is the core of any disease. Holistic nursing care for children focus on helping the child, parents family members and community to achieve the optimal health.

1. The present study can help nurses to enrich their knowledge on postoperative nursing care.
2. Help nurses to identify the underlying pathology of conditions by monitoring the vital parameters like arterial blood gas analysis, ventilator setting and cardiac monitor.
3. Understanding the needs of children post operatively may help nurse to plan and provide appropriate nursing care to children.

Nursing service

1. Nurses working in pediatric ward unit should have special training about pediatric intensive care unit.
2. Nurses working in pediatric ward should have enough knowledge about care of children they should be keen observer since the children cannot verbalize their needs.

3. Nurses should never fail to assess the children before starting care so that they can plan the nursing care accordingly.
4. Not only nurses but all the other health care providers like physiotherapist, radiologist, laboratory and ward assistances should be also given in service education regarding aseptic technique.
5. Rewards can be given to the outstanding nurses in each year in all institutions which will boost the nurses.
6. Facilitation and all required monitors and equipments to be made available for managing children who underwent cardiac surgery in all hospitals.

Nursing education

1. Nursing curriculum can be modified with increased emphasis of medical and surgical management.
2. Recommendation for short term courses in relation to pediatric intensive care unit.
3. Students can also be trained to work in pediatric intensive care unit and pediatric ward under proper guidance.

Nursing administration

1. People at the administration position can be make necessary policies to implement the concept of child health nursing.
2. The ideal set up of the pediatric ward and pediatric intensive care unit should be beneficial for the better care.
3. Administration can organize in service education programs.
4. Adequate staffing in pediatric ward to be given as per norms.

Nursing research

1. This study shows the awareness about the congenital heart disease management among public.
2. The study reveals the sound knowledge of the nurse in using advanced equipment.
3. The study is preliminary step for exploring the concept of nursing and involved nursing care with respect to the involvement of the children.
4. Further investigator can use this study as a reference material.
5. The study provides awareness for further studies among the student in this area.

RECOMMENDATION

1. The study can be done in comparing with other cardiac problems or any associated problems with congenital heart disease.
2. Descriptive analysis with congenital heart disease, pediatric cancer and congenital heart disease with Down syndrome can be done.
3. Comparative study between the sign and symptoms in pre and post operative period in congenital heart disease can be done.
4. The study can be done in large samples.
5. The study can be conducted in children in a particular region or area to find out the influence of environmental factors for congenital heart disease.
6. A comparative study can be done between the rural and urban children.
7. A descriptive study to assess the knowledge, attitude and practice regarding various aspects of congenital heart disease.

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APPENDIX - I

DEMOGRAPHIC VARIABLES

1. Age of the child when disease was identified
    a. 0 – 4 years ☐
    b. 4 – 8 years ☐
    c. 8 – 12 years ☐
    d. 12 – 16 years ☐

2. Gender
    a. Male ☐
    b. Female ☐

3. Age of the mother during conception
    a. 18 – 22 years ☐
    b. 23 – 27 years ☐
    c. 28 – 32 years ☐
    d. above 32 years ☐

4. Religion
    a. Hindu ☐
    b. Christian ☐
    c. Muslim ☐

5. Type of Marriage
    a. Consanguineous ☐
    b. Non- consanguineous ☐

6. Exposure to toxicity during pregnancy

   a. Yes ☐
   b. No ☐

7. Family history of Congenital heart diseases

   a. Yes ☐
   b. No ☐

8. Residence

   a. Rural ☐
   b. Urban ☐

9. Source of health information through

   a. Mass media ☐
   b. Health personnel ☐
   c. Friends and relatives ☐

10. Child associated with any chromosomal abnormalities

   a. Yes ☐
   b. No ☐

APPENDIX - II

ONGOING ASSESSMENT OF HEALTH STATUS ON CHILDREN WHO UNDERWENT CARDIAC SURGERY IN POST OPERATIVE PERIOD

Sl. No.	Criteria	Score	Days				
			0	1	2	3	4
1.	**Eye Opening**						
	1. Spontaneous	1					
	2. Open to speech	2					
	3. Open to pain	3					
	4. Remain closed	4					
2.	**Verbal response**						
	1. Oriented	1					
	2. Confused / disoriented	2					
	3. Inappropriate words	3					
	4. No response	4					
3.	**Motor Response**						
	1. Obeys Commands	1					
	2. Localizes pain	2					
	3. Abnormal flexion and extension	3					
	4. No response / Flaccid	4					
4.	**Pupils Reaction**						
	1. Brisk	1					
	2. Diminished	2					
	3. Sluggish	3					
	4. Absent	4					
5.	**Mode of ventilation**						
	1. Extubated	1					
	2. Continuous positive airway pressure	2					
	3. Synchronized intermittent mandatory ventilator	3					
	4. Control mode ventilator	4					

Sl. No.	Criteria	Score	Days				
			0	1	2	3	4
6.	**Breath Sounds**						
	1. Bilateral equal air entry	1					
	2. Adventitious sound	2					
	3. Unilateral air entry	3					
	4. Respiratory distress	4					
7.	**Respiratory Rate**						
	1. 20-30 breaths / min	1					
	2. 30-40 breaths / min	2					
	3. 40-50 breaths / min	3					
	4. >50 breaths / min	4					
8.	**Secretions Colour**						
	1. Clear	1					
	2. White	2					
	3. Yellow	3					
	4. Pink	4					
9.	**Secretion character**						
	1. Moderate	1					
	2. Thin	2					
	3. Thick	3					
	4. Red	4					
10.	**Saturated pressure of oxygen**						
	1. 100 – 92%	1					
	2. 92 – 85%	2					
	3. 85 – 80%	3					
	4. >80%	4					

Sl. No.	Criteria	Score	Days				
			0	1	2	3	4
11.	**Oxygen supply**						
	1. Room air	1					
	2. 1 litre	2					
	3. 2 litres	3					
	4. 4 litres	4					
12.	**Pulse rate**						
	1. 100-110 beats/min	1					
	2. 110-120 beats/min	2					
	3. 120-130 beats/min	3					
	4. 130-140 beats/min	4					
13.	**Blood pressure**						
	1. 100/60 mm Hg	1					
	2. 115/75 mm Hg	2					
	3. 130/85 mm Hg	3					
	4. 145/95 mm Hg	4					
14.	**Central venous pressure**						
	1. < 8 mmHg	1					
	2. 8-10 mmHg	2					
	3. 10-12 mmHg	3					
	4. > 12 mmHg	4					
15.	**Edema**						
	1. Absent	1					
	2. Facial edema	2					
	3. Dependent	3					
	4. Generalized	4					
16.	**Bowel Sounds**						
	1. Increased sound	1					
	2. Normal sound	2					
	3. Sluggish	3					
	4. Absent	4					

Sl. No.	Criteria	Score	Days				
			0	1	2	3	4
17.	**Abdominal Tone**						
	1. Soft	1					
	2. Firm	2					
	3. Tender	3					
	4. Distended	4					
18.	**Surgical Wound**						
	1. Clean	1					
	2. Oozing	2					
	3. Gaping	3					
	4. Open infected	4					
19.	**Skin colour**						
	1. Pink	1					
	2. Flushed	2					
	3. Pale	3					
	4. Cyanotic	4					
20.	**Pain**						
	1. No pain	1					
	2. Mild pain	2					
	3. Moderate pain	3					
	4. Severe pain	4					

APPENDIX – III

OBSERVATIONAL CHECKLIST OF NURSING INTERVENTION ON CHILDREN WHO UNDERWENT CARDIAC SURGERY

Sl. No.	Criteria	Days				
		0	1	2	3	4
1	Monitoring vital parameters for every one hour					
2	Pain relieving measures					
3	Promote rest and comfort					
4	Administration of medication					
5	Maintenance of intake and output chart					
6	Meeting nutritional needs					
7	Meeting hygienic needs					
8	Change of position,					
9	Prevention of infection (aseptic technique)					
10	Dressing and suture removal					
11	Chest physiotherapy					
12	Exercises					
13	Nebulization					
14	Early ambulation					
15	Meeting elimination needs					

NURSING DIAGNOSIS

1. Decreased cardiac output related to ineffectiveness cardiac function.
2. Ineffective breathing pattern related to decreased pulmonary blood flow.
3. Fluid volume excess related to inadequate cardiac functions.
4. Altered nutrition less than body requirement related to decreased caloric intake.
5. Anxiety of parents related to disease process.
6. Hypothermia related to hypothermia used in conjunction with electrocardiograph.
7. Altered level of consciousness related to anesthesia
8. Pain related to surgical incision
9. Knowledge deficit related to home care management.
10. Risk for infection related to surgical wound incision.
11. Risk for altered body temperature, hyperthermia related to infection.

APPENDIX - IV
NURSING CARE PLAN

S. No.	Assessment	Diagnosis	Goal	Intervention	Rationale	Implementation	Expected outcome
1.	**Objective data:** Tachycardia Tachyphea Decreased Capillary refill poor color	Decreased cardiac output related to ineffectiveness cardiac function.	The chill will maintain adequate cardiac output.	1. Assess the, developmental age and child's overall status. 2. Keep child warm and comfortable. 3. Administer oxygen as necessary. 4. Keep head of bed elevated. 5. Administer medication as per order.	Help to plan for further management. Help to decrease the oxygen demands of the body. Help to comfort child and ease breathing. Help for good lung expansion. Help to maintain the cardiac output.	Child developmental age and overall status was assessed. Child was kept warm by using warmer. Oxygen 4 lit per min was administered. Head was elevated to 45^{o} angle. Inotropics drugs was administered.	The chill maintained adequate cardiac output.

S. No.	Assessment	Diagnosis	Goal	Intervention	Rationale	Implementation	Expected outcome
2.	**Objective data:** Tachypnea retraction cyanosis, restlessness, dyspnea	Ineffective breathing pattern related to decreased pulmonary blood flow.	The child will maintain optimal respiratory status.	1. Assess the respiratory status frequently. 2. Monitor the blood gas and oxygen saturation level. 3. Elevate the head of the bed. 4. Administer oxygen as needed. 5. Provide suction as needed.	Help to plan for further management. Help to prevent the complication. Help to maximize the lung expansion. Help to dilate bronchioles, to help ease respiration. Help to decrease congestion.	Pulse rate, respiration rate, retraction, cyanosis was assessed. Blood gas and oxygen saturation level was assessed. Head was elevated to 45° angle. Oxygen 4 lit per min was administered. Suction was provided when needed.	The child maintained optimal respiratory status.

S. No.	Assessment	Diagnosis	Goal	Intervention	Rationale	Implementation	Expected outcome
3.	**Objective data:** Odema, decrease urine output, increasing weight	Fluid volume excess related to inadequate cardiac functions.	The child will maintain optimal fluid balance.	1. Assess the weight twice daily. 2. Monitor intake and output chart. 3. Maintain fluid restriction. 4. Administer diuretics. 5. Encourage child to change position frequently.	Help to plan for further management. Help for planning the care. Help to decrease the chance of fluid overload. Help to remove excess fluid. Help to mobilize fluids.	The weight was assessed twice daily. Intake and output chart was monitored. Fluid restriction was maintained as per ordered. Diuretics was administered. Child was encouraged to change position frequently.	The child maintained optimal fluid balance

S. No.	Assessment	Diagnosis	Goal	Intervention	Rationale	Implementation	Expected outcome
4.	**Objective data:** Inability to take full feeding, decreased weight	Altered nutrition less than body requirement related to decreased caloric intake.	The child will maintain optimal nutritional status.	1. Assess the weight of the child. 2. Administer calories by NG tube or parenterally. 3. Provide small frequent feeding. 4. Hold baby at 45° angle while feeding.	Help to plan for further management. Help to ensure adequate nutritive balance. Help to provide adequate rest between feeding. Help to allow maximum lung expansion.	The weight was assessed. Parenteral fluids was administered. Small frequent feeding was provided. Baby was held at 45° angle while feeding.	The child maintained optimal nutritional status

S. No.	Assessment	Diagnosis	Goal	Intervention	Rationale	Implementation	Expected outcome
5.	**Objective data:** Many questions verbalized fear about child's status worry	Anxiety of parents related to disease process.	The parents anxiety level will reduce.	1. Assess the anxiety level and knowledge level of the parent. 2. Provide emotional support to family members and child. 3. Explain rationale for actions taken. 4. Answer the questions by family members.	Help in planning the cure. Help to provide reassurance of child's condition. Help to make child more comfortable and reduce fear of unknown. Help to reassure Family.	Anxiety level and knowledge level of the parent was assessed. Emotional support to family members and child was provided. Rationale for every actions was explained. Questions by family members was answered.	The parents anxiety level was reduced

S. No.	Assessment	Diagnosis	Goal	Intervention	Rationale	Implementation	Expected outcome
6.	**Objective data:** Skin cool with decreased perfusion tachycardia	Hypothermia related to hypothermia used in conjunction with Electro cardiograph.	The child will maintain normal body temperature	1. Monitor the temperature continuously 2. Increase body temperature as ordered 3. Provide child with warmer 4.Avoid placing child under air conditioner. 5. Cover the child with the blanket.	Help in planning the care Help to increase the temperature Help to reduce the temperature loss Help to reduce the temperature loss Help to reduce the temperature loss	Temperature was monitored continuously. body Temperature was increased as ordered Child was provided with warmer. Avoided child placing under air conditioner. Child was covered with blanket.	The child maintained normal body temperature

S. No.	Assessment	Diagnosis	Goal	Intervention	Rationale	Implementation	Expected outcome
7.	**Objective data:** Failure to awaken from anesthesia, agitation, unequal pupils	Altered level of conscious -ness related to anesthesia	The child will maintain optimal state of consciousness	1. Assess the neurological function. 2. Reorient child to surrounding as needed. 3. Notify surgeon of any changes in neurological assessment.	Help in planning the care. Help to regain the consciousness. Help in preventing complications.	Neurological status was assessed. Child was reoriented to the surrounding. Surgeon was notified the changes in neurological status.	The child maintained optimal state of conscious-ness

S. No.	Assessment	Diagnosis	Goal	Intervention	Rationale	Implementation	Expected outcome
8.	**Objective data:** Facial mask of pain, restlessness, guarding behavior	Pain related to surgical incision	The child pain will minimize	1. Assess the pain and tolerance level of the child. 2. Use holding, touching and soothing verbal reassurance. 3. Provide additional comfort measures. 4. Administer medication as per order. 5. Provide diversional therapy (Play).	Help in planning the care. Help to reduce pain. Help to minimize the pain. Help to minimize the pain. Help to reduce pain and divert pain.	Pain and tolerance level of the child was assessed. Holding, touching and soothing verbal reassurance was used. Additional comfort measures was provided. Analgesic was administered as per order. Diversional therapy (Play) was provided.	The child pain was minimized

S. No.	Assessment	Nursing Diagnosis	Goal	Planning	Rationale	Implementation	Evaluation
9.	**Subjective Data :** Parents verbalizes that “how can I care the surgical area at home”. **Objective Data :** The parents express queries about home care management.	Knowledge deficit related to home care management.	The child will acquire knowledge about home care.	Teach about importance of regular medication. Encourage active exercise at home. Demonstrate wound dressing. Instruct about clinical signs and symptoms of infection Teach about dietary intake. Instruct about regular follow up care.	Promotes wound healing. Enhances muscle strength and circulation. It helps for wound healing. Minimizes extensive complications. Enhances nutritional status. Promotes recovery process.	Taught about importance of regular medication. Encouraged active exercise at home. Demonstrated wound dressing. Instructed about clinical signs and symptoms of infection Taught about dietary intake. Instructed about regular follow up care.	Parents acquired knowledge about care at home.

S. No.	Assessment	Nursing Diagnosis	Goal	Planning	Rationale	Implementation	Evaluation
10.	**Objective Data :** The child had surgical incision and wound drain.	Risk for infection related to surgical wound incision.	The child will protect from infection.	Monitor vital signs Change the dressing daily with aseptic technique. Watch for redness edema and increased warmth around the surgical incision. Monitor the amount and characteristics of wound drain. Administer antibiotics as prescribed. Provide high caloric high protein diet	Vital signs provides baseline for further care. It reduces the growth of micro organism. It indicates infection. It helps to reduce complication. It suppress the growth of micro organism. It enhances immunity against infection.	Monitored vital signs Changed the dressing daily with aseptic technique. Watched for redness edema and increased warmth around the surgical incision. Monitored the amount and characteristics of wound drain. Administered antibiotics as prescribed. Provided high caloric high protein diet	No signs of infection were observed.

S. No.	Assessment	Nursing Diagnosis	Goal	Planning	Rationale	Implementation	Evaluation
11.	**Objective Data :** The child had surgical incision and wound drain.	Risk for altered body temperature, hyperthermia related to infection.	The patient will maintain normal thermoregulation.	Monitor vital signs Maintain comfortable room temperature. Administer prophylactic antibiotics as prescribed. Administer adequate fluid as order. Change the dressings with aseptic technique.	Vital signs provides data for further care. It balance heat conservation and heat loss. Antibiotic kills micro organism and prevent infection. Fluid supplementation prevent dehydration. It promotes wound healing.	Monitored vital signs Maintained comfortable room temperature. Administered prophylactic antibiotics as prescribed. Administered adequate fluid as order. Changed the dressings with aseptic technique.	Child thermoregulation was maintained normal.

APPENDIX - V

CASE ANALYSIS

SAMPLE NO	**:**	**1**
Gender	:	Male
Age	:	4 yrs
Diagnosis	:	Atrial septal defect
Type of surgery	:	Dacron patch closure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**2**
Gender	:	Female
Age	:	3 yrs
Diagnosis	:	Ventricular sepal defect
Type of surgery	:	Dacron patch closure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**3**
Gender	:	Male
Age	:	2 ½ yrs
Diagnosis	:	Patent ductus arteriosus
Type of surgery	:	Dacron patch closure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO : 4

Gender : Male

Age : 3 yrs

Diagnosis : Atrial septal defect

Type of surgery : Dacron patch closure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO : 5

Gender : Female

Age : 5 yrs

Diagnosis : Tetralogy of fallot

Type of surgery : Modified blalock taussing shunt with pulmonary artery banding.

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On 1st post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**6**
Gender	:	Female
Age	:	6 yrs
Diagnosis	:	Tetralogy of fallot
Type of surgery	:	Modified blalock taussing shunt with patch closure.

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On 1st post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**7**
Gender	:	Male
Age	:	5 ½ yrs
Diagnosis	:	Ventricular septal defect
Type of surgery	:	Dacron patch closure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On 1st post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO : 8

Gender : Male

Age : 61/2 yrs

Diagnosis : Kawashima

Type of surgery : Kawashima repair

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On 1st post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO : 9

Gender	:	Male
Age	:	7 yrs
Diagnosis	:	Tetralogy of fallot
Type of surgery	:	Modified blalock taussing shunt with pulmonary artery banding

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On 1st post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**10**
Gender	:	Male
Age	:	7 yrs
Diagnosis	:	Total anomalous pulmonary venous connection.
Type of surgery	:	Congenital cardiac correction

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On 1st post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO : 11

Gender : Female

Age : 5 yrs

Diagnosis : Atrial septal defect

Type of surgery : Dacron patch closure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On 1st post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO : 12

Gender : Male

Age : 6 yrs

Diagnosis : Ventricular sepal defect

Type of surgery : Dacron patch closure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On 1st post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**13**
Gender	:	Male
Age	:	8 yrs
Diagnosis	:	Tetralogy of fallot
Type of surgery	:	Modified blalock taussing shunt with pulmonary artery banding.

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On 1st post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**14**
Gender	:	Female
Age	:	9 yrs
Diagnosis	:	Atrioventricular canal defect
Type of surgery	:	Pulmonary artery banding

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**15**
Gender	:	Female
Age	:	10 yrs
Diagnosis	:	Tetralogy of fallot
Type of surgery	:	Modified blalock taussing shunt with pulmonary artery banding

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**16**
Gender	:	Male
Age	:	101/2 yrs
Diagnosis	:	Tetralogy of fallot
Type of surgery	:	Modified blalock taussing shunt with pulmonary artery banding

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**17**
Gender	:	Male
Age	:	11 yrs
Diagnosis	:	Tricuspid atresia
Type of surgery	:	Bidirectional Glenn shunt

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**18**
Gender	:	Female
Age	:	12 yrs
Diagnosis	:	Tetralogy of fallot
Type of surgery	:	Modified blalock taussing shunt

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**19**
Gender	:	Male
Age	:	12 yrs
Diagnosis	:	Tetralogy of fallot
Type of surgery	:	Modified blalock taussing shunt with pulmonary artery banding

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**20**
Gender	:	Female
Age	:	10 yrs
Diagnosis	:	Transposition of great artery
Type of surgery	:	Arterial switch procedure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**21**
Gender	:	Male
Age	:	13 yrs
Diagnosis	:	Tetralogy of fallot
Type of surgery	:	Modified blalock taussing shunt

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO : 22

Gender : Female

Age : 15 yrs

Diagnosis : Hypoplastic left heart syndrome

Type of surgery : Norwood procedure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**23**
Gender	:	Male
Age	:	16 yrs
Diagnosis	:	Tetralogy of fallot
Type of surgery	:	Modified blalock taussing shunt with pulmonary artery banding.

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**24**
Gender	:	Female
Age	:	16 yrs
Diagnosis	:	Tetralogy of fallot
Type of surgery	:	Modified blalock taussing shunt

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**25**
Gender	:	Female
Age	:	15 yrs
Diagnosis	:	Atrial sepal defect
Type of surgery	:	Dacron patch closure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**26**
Gender	:	Male
Age	:	14 yrs
Diagnosis	:	Ventricular septal defect
Type of surgery	:	Dacron patch closure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**27**
Gender	:	Male
Age	:	15 yrs
Diagnosis	:	Tetralogy of fallot
Type of surgery	:	Modified blalock taussing shunt with pulmonary artery banding.

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**28**
Gender	:	Female
Age	:	15 yrs
Diagnosis	:	Ventricular septal defect
Type of surgery	:	Dacron patch closure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**29**
Gender	:	Female
Age	:	13 yrs
Diagnosis	:	Tetralogy of fallot
Type of surgery	:	Modified blalock taussing shunt

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.

SAMPLE NO	**:**	**30**
Gender	:	Male
Age	:	15 yrs
Diagnosis	:	Ventricular septal defect
Type of surgery	:	Dacron patch closure

Nursing Intervention:

The child was received in pediatric intensive care unit. Vital parameters was monitored and maintained the homeostasis. Child conscious level was checked and extubation was done with in six hours after surgery. Oxygen was administered at four liters per minute through face mask. IV fluids and inotropics drugs was administered. Test feed was started, according to the tolerance oral feed was continued. On first post operative day central line, chest tubes, urinary catheter were removed. Personal hygiene were met. Wound dressing was done. Chest physiotherapy, nebulisation, was given. On second post operative day exercise, early ambulation and diversional therapy was given. On fifth post operative day the child condition was hemodynamically stable and was shifted to post operative ward.