EFFECTIVENESS OF POSITIONS UPON VITAL PARAMETERS AMONG PRETERM NEONATES

BY

REVATHY.G

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

MARCH 2011

EFFECTIVENESS OF POSITIONS UPON VITAL PARAMETERS AMONG PRETERM NEONATES

Approved by the Dissertation Committee on: _____

Research Guide : _____

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

Clinical Guide **:** _____

Mrs. Nesa Sathya Satchi M.Sc (N).,
Reader, Pediatric Nursing,
Apollo College of Nursing,
Chennai – 600 095.

Medical Guide : _____

Dr.Jayakumar Reddy, MD,
Consultant Pediatrics,
Apollo Children Hospital,
Chennai – 06.

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

MARCH 2011

DECLARATION

I hereby declare that the present dissertation titled **"Effectiveness of positions upon vital parameters among preterm neonates"** is the outcome of the original research work undertaken and carried out by me, under the guidance of **Dr. Latha Venkatasen, M.Sc (N)., M.Phil., Ph.D.,** Principal and Professor in Obstetric and Gynecological Nursing, Apollo College of Nursing and **Mrs. Nesa Sathya Satchi M.Sc (N).,** Reader, Pediatric Nursing**,** Apollo College of Nursing. Chennai. I also declare that the material of this has not formed in any way, the basis for the award of any degree or diploma in this university or any other universities.

CHAPTER I

INTRODUCTION

Background of the study

"A baby is God's opinion that the world should go on".
~Carl Sandburg

When a baby enters into the parent's life, the baby makes them to forget their worries and strife. It really doesn't matter whether it's a girl or a boy; a baby will melt your heart and bring joy. Birth of baby is a complex process. It is the wonderful and finest gift of nature. A baby has to do many physical adjustments immediately after the birth. A high risk newborn is any neonate regardless of gestational age or birth weight who has increased risk of morbidity and mortality because of conditions or circumstances superimposed on the normal course of events associated with birth and adjustment to extra uterine existence. Recently advanced technology and appropriate neonatal care have improved survival rates of preterm neonates.

As a rule of thumb by Meherban Singh (2004) the later that a baby is born, the better her chances for survival neonates who are born at 24 weeks of pregnancy have about 50% survival rate, neonates born at 28 weeks do much better, with about an 80% of survival rate. Neonates who are born after 32 weeks have a survival rate of 90%. Most preterm neonates are at risk of respiratory distress and respiratory failure caused by an immature respiratory center in the Central Nervous System these neonates were usually intubated for assisted ventilation (Curley and Thompson 2001).

Besides minimal handling, positioning is another essential aspect of caring preterm neonates. They should be placed in a properly supported position to ensure functional support to all parts of the body as well as for physical safety. Position influences cardiopulmonary function, neurobehavioral development and temperature control. Several studies found that appropriate position affects pulmonary function, gas exchange and tidal volume.

Preterm neonates are more comfortable when they are lying in prone position as it increases lung compliance, enhances arterial oxygenation, passage of flatus and decreases risk of aspiration. (Meherban Singh, 2004). The prone position has been shown to increase oxygen saturation, decreases the episodes of desaturation and leads to more thoraco – abdominal synchrony and a lesser heart rate than supine position both in newborn and preterm neonates (Dowling and Lin 2002).

Kurlak (2000) conducted a study to assess the effect of nursing position on incidence, type and duration of clinically significant apnea in preterm neonates and the results revealed that 20% of neonates were found to have significantly more central and mixed apneas in the supine position than in prone position .

Kulgelman et al (2002) conducted a randomized control trial found that there were more short apneas in the supine position with and without inclination and in sidelying position as compared to the prone position. There were also more apneas in the supine position as compared to the side lying position.

Although research shows advantages and disadvantages for both supine and prone position among preterm neonates, there is a trend remaining toward keeping

preterm neonates in a supine position; mainly for ease of observation and handling. Also, there is a belief that there is increased risk of sudden neonate death syndrome in neonates placed in a prone position. Therefore, clarification of the benefits and potential risks associated with body positioning in preterm neonates is required to provide evidence-based clinical practice.

Therefore this study was conducted to investigate the effectiveness of lateral, supine and prone position upon vital parameters among preterm neonates.

Need for the study

A baby is born with a need to be loved - and never outgrows it. Usually preterm neonates have increased energy expenditure increased oxygen consumption and changes in stability results in sleep-wake disturbances. Therefore preterm neonate should be provided with an optimal position.

Dhaar and Robbani (2006) stated that the incidence of Low birth weight is the reflection of health of a country in general, and that of maternal health in particular. World wide birth rate of preterm is estimated to be 9.6% representing about 12.9 million neonates. The rating is highest in Africa 11.9% .Among the Low birth weight neonates born in India two third are full term and the remaining is preterm.

Wilawan Pichaean Sathian (2009) found that positioning of preterm neonates is a basic task of neonatal nursing care. Preterm neonates were found to have improvement in arterial oxygen saturation, improvement in lung and chest wall synchrony of respiratory movements, decreased incidence of apnea, and promotion of sleep and decreased gastro esophageal reflux.

Keene et al (2000) conducted a study to investigate the effects of positioning on the cardio respiratory stability of preterm neonates with symptomatic apnea or bradycardia. The overall incidence of apnea (≥ 10 seconds) was not different between the prone and supine position, however, the incidence of mild episodes of apnea (<15 seconds) was greater in the prone position. No difference in the incidents of clinically significant episodes of apnea (≥15 seconds) was found between the two positions. Duration of longest apnea was similar between prone and supine positions (26.8±14.4 seconds versus 31.4±16.1 seconds).

Prone position increases functional residual capacity there by reducing end respiratory airspace closure. Thus placing preterm neonates in prone position increases oxygen saturation and tidal volume, decreases respiratory rate,desaturation and hypoxemic episodes. Neonates have more quite sleep and less apnea when compared with supine position.

While the investigator was working in a neonatal intensive care unit she observed that there was need for frequent intubation as the oxygen saturation lowered frequently. However many research results have shown that the prone position increases the level of oxygen saturation among preterm neonates but it is not followed in all health care units. So the researcher was motivated to conduct a study to assess the effectiveness of lateral, supine and prone position upon level vital parameters among preterm neonates. The outcome of study will serve as a guideline for the appropriate position of preterm neonates which in turn improves the physiological status.

Statement of the problem

A quasi-experimental study to assess the effectiveness of positions upon vital parameters among preterm neonates admitted in NICU at selected hospital, Chennai.

Objectives of the study

1. To determine the effectiveness of positions upon the vital parameters among preterm neonates.
2. To compare the effectiveness of various positions upon the vital parameters among preterm neonates.
3. To find out the association between the selected neonatal variables and the level of oxygen saturation in various positions among preterm neonates.
4. To assess the level of satisfaction of the nurses regarding effect of positions upon the vital parameters among preterm neonates.

Operational definitions

Effectiveness

In this study it refers to the expected and desired change in vital parameters after keeping preterm neonates in lateral position for one hour followed by supine position for one hour and prone position for one hour for 3 consecutive days.

Positions

In this study it refers to placing the preterm neonates in lateral position for one hour followed by supine position for one hour and prone position for one hour for three consecutive days.

Vital parameters

In this study it refers to the observation of the temperature, pulse, respiration, B.P, oxygen saturation among preterm neonates in different positions.

Preterm neonates

In this study it refers to neonates who are between the gestational ages of 26 to 37 weeks.

Null Hypotheses

Ho1: There will be no significant difference in vital parameters between the positions.

Ho2: There will be no significant association between the selected neonatal variables and the level of oxygen saturation in various positions among preterm neonates.

Assumptions

- Apnea among preterm is a common problem which is caused by immaturity of the lungs.
- Pulse oximetry is used both as an indicator of hypoxia and hyperoxia to protect against retinopathy of preterm.
- Left lateral position reduces the gastro esophageal reflux in preterm neonates
- Positional changes can alter the respiratory physiology.

Delimitations

The study was limited to preterm neonates,

- Whose gestational age was above 26 weeks and less than 37 weeks of gestation.
- Who were admitted in Kanchi Kamakoti Childs trust hospital.
- Who were admitted in neonatal intensive care
- The study was limited to four weeks

Conceptual framework

The conceptual framework deals with the interrelated concepts that are assembled together in some rational schemes by virtue of their relevance to a common theme. (Polit and Beck, 2004).

The conceptual framework in this study was the Al's synactive theory (ALs, 1982; Als, 1986; Lawhon, 1986), which described preterm neonate behaviours. The neonate's behaviors are viewed as subsystems of functioning. Each subsystem functions in relation to the other. There are five subsystems which include the autonomic system, the motor system, the state organization system, the attention and interaction system, and the self-regulation system. These five subsystems function interdependently and influence each other.

The autonomic system

The autonomic system is the physiological functioning of the neonate's body necessary for survival. This subsystem is observable via temperature, heart rate, respiratory rate, blood pressure and oxygen saturation.

The motor system

The motor system is the behavior associated with muscle tone, posture and generalized body movement.

The state organization system

The state organization system is the neonate's ability to display different ranges of state from the asleep to the arouse state.

The attention and interaction system

The attention of interaction system is exemplified by the organism's ability to come to an alert, attentive state and to utilize this sate to take in cognitive and social-emotional information from the environment and in turn elicit and modify inputs from the environment.

The self regulation system

The self regulation system is associated with the neonate's ability to achieve and maintain a balance of these subsystems through the use of self consoling behaviors such as sucking or hand-to- mouth maneuvers.

The purpose of positioning was to decrease neonate's stress, and enhance the motor and physiological functioning. The neonates with an appropriate position will promote functioning of subsystems, resulting in stabilizing the heart rate, respiration rate, blood pressure and oxygen saturation. The neonates will adapt to environment effectively, and therefore have increased REM sleep.

The proper position with a boundary could promote neonate's self regulation, help them to adapt to the environment, and have less energy expenditure that can be measured by physiological measurement. Therefore, in this study the researcher emphasized the effect of positioning in the preterm neonates, on autonomic systems such as oxygen saturation, respiration rate, heart rate, blood pressure and temperature.

Fig.1. Conceptual framework for the study based on the Synactive theory of neonate development

Projected outcome

The expected outcome of the study is that preterm neonates with an appropriate position will maintain stable temperature, heart rate, respiratory rate, blood pressure and oxygen saturation.

Summary

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

Organization of the report

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

In chapter II : Review of literature

In chapter III : Research methodology which includes research approach, research design, setting, population, sample and sampling technique, tool description, validation and reliability of tools, pilot study, data collection procedure and plan for data analysis.

In chapter IV : Analysis and interpretation of the data

In chapter V : Discussion.

In chapter VI : Summary, conclusion, implication and recommendation.

CHAPTER - II

REVIEW OF LITERATURE

Review of literature is an essential component of the research process. It is critical examination of a publication related to a topic of interest. Review should be comprehensive and evaluative. Review of literature helps to plan and conduct the study in a systematic manner.

Review of literature helps the researcher to build on existing work that he/ she should understand what is already known in the topic (Polit and Hungler 2007).

The task of reviewing literature involves the identification, selection, critical analysis and written description of existing information on the topic of interest. (Polit and Beck, 2004).

This chapter deals with the review of published research studies and related materials for the present study. The review helped the investigator in building the foundation of the study. It helps the researcher to find the accurate data that could be used for supporting the present findings and drawing conclusions.

The review of literature in this chapter is presented under the following headings.

- **Literature related to incidence of preterm neonates.**
- **Literature related to problems of preterm neonates.**
- **Literature related to effectiveness of positioning upon vital parameters among preterm neonates.**

Literature related to incidence of preterm neonates

John Cloherty (2010) stated that preterm delivery is associated with following conditions: low socioeconomic status, maternal age (younger than 16 or older than 35), maternal activity (longer periods of standing or substantial amount of physical stress), maternal illness, prior poor birth outcome and multiple gestation birth.

In Australia, an epidemiological study was conducted by Moshin et al (2008) to examine the influence of continuous smoking and previous pregnancy outcomes on subsequent pregnancy outcomes. 1500 mothers were studied and concluded that previous preterm birth, short birth interval, ante-natal care, gestational diabetes and smoking habits in two successive pregnancies had relatively strong association with a subsequent preterm birth. It concluded that during pregnancy increases the risk for incidence of Preterm neonates.

In 2008, Brown et al conducted an epidemiological study in U.S.A to examine the previous abortion and risk of preterm births. The study used data from United States Collaborative Prenatal Project and concluded that women who had two or three abortion history are 9.5 times more likely to have preterm births. Thus previous obstetrical history contributes to incidence of preterm neonates.

Siza (2008) conducted a retrospective cross-sectional study to assess the risk factors associated with preterm neonates of pregnant women in Tanzania. 3464 pregnant women were included in the study and concluded that pregnant women with malnutrition (BMI

<18) gave the highest proportion 17% of preterm neonates. It also found that hypertension, eclampsia, thrombocytopenia, anemia, tuberculosis, malaria among mothers attributed to highest prevalence of preterm neonates. Thus maternal illness during pregnancy increases the incidence of preterm neonates.

Literature related to problems of preterm neonates

Cloherty (2010) stated that preterm neonates will have problems due to difficulty in extra uterine adoption and immaturity of organs. Those are perinatal depression, RDS, neurological problems like ICH, periventricular white-matter and neural injury, cardiovascular problems like hypotension, hypovolemia, cardiac dysfunction, hemaologic dysfunction like anaemia and hyperbilirubinemia, metabolic problems like glucose and calcium metabolism, susceptible to hyperthermia or hypothermia.

Apnea of preterm is a common problem of the preterm neonate caused by the immature growth of the respiratory control centre in the medulla. Preterm neonates have prolonged respiratory control centre in the medulla. The preterm neonates have prolonged respiratory pauses of more than 20 second, with cyanosis and decreased heart rate to less than 100 beats per minute. Apnea of preterm usually occurs in the preterm neonate with a gestational age less than 34 weeks. Symptom onset is in 1-2 days and improvement occurs or recovers when the gestational age is 37 weeks Wongs (2006).

Dutta (2001) stated that preterm neonates will have the following problems due to the anatomical and functional immaturity such as asphyxia, poor cough reflex,

incoordinated swallowing and sucking reflex due to the immaturity of the central nervous system. Hypothermia is related to poorly developed thermoregulation centre and poor insulating subcutaneous fat and less brown adipose tissue. Anaemia is mainly due to the hypo function of the bone marrow and excessive haemolysis, and they are also susceptible to infection due to the inefficient cellular immunity and low level Ig G antibody

Literature related to effect of positioning on vital parameters among preterm neonates

A systematic review was conducted by Willawan Pichean Sathian (2009) to assess the physiological outcomes affected by different positioning of preterm neonates and the best position for promoting sleep. The study revealed that positioning of preterm neonates is a basic task of neonatal nursing care. Prone position in preterm neonates is for the improvement of arterial oxygen saturation improved lung and chest wall synchrony of respiratory movements, decreased incidence of apnea in neonates with a clinical history of apnea, promoted sleep and decreased gastro esophageal reflux.

Arslan et al (2007) and associates conducted a quasi experimental study to determine the effect of position given by nurses to preterm neonates whose condition were stable after mechanical ventilation, on oxygen saturation, pulse rate, respiratory rate, behavioural distress of them. Twenty preterm neonates where assigned randomly into four different groups. Every position was given for 20-minute periods and before other position was given. The results demonstrated that there was no statistical difference in any

parameters of the study. The study revealed that all four position sequences could be used safely after mechanical ventilation.

In 2006, Anne Greenough et al conducted a study to assess the effect of prone position in improving lung volume and oxygen saturation in preterm neonates, 41 samples were selected randomly with an average gestational age of 28 weeks, among them 21 of the neonates were on oxygen therapy. The study revealed that overall lung volumes were higher in the prone position throughout the study period, there was no significant effect of postmenstrual age on lung volumes, overall SPO2 was higher in the prone positions and the effects were significant in the oxygen dependent neonates.

A comparative study was conducted by Jennifer Levy (2006) to assess the effectiveness of prone position versus supine position in the preterm neonates on work of breathing and breathing patterns. 19 preterm neonates with acute respiratory distress were better oxygenated and have improved breathing synchrony when they are nursed in prone position. Positioning was randomized. Calibrated respiratory inductance plethysomography was used to measure lung tidal volume. An esophageal catheter estimated the pleural pressure. Inspiratory, elastic and restricted work of breathing were calculated and were found to be unaffected by prone versus supine position respectively.

Preterm neonates were quite comfortable when they were lying in prone, since rapid rate of breathing with respiratory distress was slightly lower in the prone position. This was revealed by a comparative study to assess the effects of supine and prone position among 20 preterm neonates with respiratory distress. (Fitzerald, 2005).

In 2004, Bredemeyer conducted a study to assess the effect of body position for spontaneous breathing neonates with apnea indicated that different body position has got various effects on lung volumes. Placement of preterm neonates in prone position increases the curvature of the diaphragm and during inspiration this results in more effective contraction of the diaphragm thus decreasing the work of breathing.

Chang and associates (2002) did a study to determine the effects of supine and prone position on oxygen saturation, desaturation episodes, and motor activity in ventilated preterm neonates during their first postnatal week in neonatal intensive care units at 2 tertiary care centers. The neonates who had the a gestational age of 25 to 36 weeks were assigned randomly to supine and prone position or prone to supine position sequence, and neonates were placed in each position for 2 hours. A stabilization period was allowed for 10 minutes before observation of each position.

The result of the study revealed that in prone position, the neonates had higher oxygen saturation, fewer episodes of oxygen desaturation, and less motor activity than in supine position. There were no significant differences in duration of oxygen saturation less than 90%, 85%, and 80% between the two positions. 74%of desaturation episodes were associated with vigorous motor activity and crying.

The prone position improves gas exchange in many patients with acute respiratory distress syndrome. This finding was found by a study of Richard (2001) to assess the effectiveness of prone position in eliminating compression of the lungs by the heart and

they found that the study results have indicated that turning prone restores ventilation to dorsal lung region without compromising ventral regions.

Stephanie. R. Yillain conducted a study in 2001 to assess the effects of sleeping position on development of neonate cardiovascular control. The heart rate and blood pressure control over the first 6 months of life studied. The sample sizes of 20 preterm neonates were studied longitudinally at 2-4 week, 2-3 months and 5-6 months with daytime polysomnography. The study revealed that fall in B.P is compromised by increase in heart rate when the neonates lying in prone.

Burns conducted a quasi randomised clinical trial in (2000) to compare the different position in newborn receiving mechanical ventilation. Eleven trials involving 206 neonates were studied in several positions like prone versus supine, prone versus lateral, lateral (right) versus supine compared .The results showed that prone found to improve arterial po_2 from 2.75to 9.72 mmHg (95%). There was also an improvement in SaO_2 from 1.18 to 4.36% found among the preterm lying in prone position.

In 2000, Kurlak and associates conducted a study to assess the effect of nursing position on frequency, type and duration of apnea in preterm neonates. Each neonate was studied in the two positions on the same day and each neonate was studied only once. The result showed that was significantly more central and mixed apnea in the supine than in the prone position.

A comparative study was conducted Jirapet and Khumsobes (1991) to assess the effect of positioning on oxygen saturation and respiratory rate for neonates at 48 hours post extubation. Each neonate randomly assigned to the sequence of study position: supine, prone, right lateral or left lateral. The study revealed that there was no significant difference in mean oxygen saturation for any of the positions, but found that posture influenced respiratory rate. In the prone position, mean respiratory rate was higher than the respiratory rate in supine, right lateral and lateral position.

Summary

This chapter has dealt with review of literature related to the problem stated. The literatures presented here were extracted from 17 primary and 3 secondary sources. It has helped the researcher to understand the impact of the problem under study. It has also enabled the investigator to design the study, develop the tool, and plan the data collection procedure and to analyze the data.

CHAPTER - III

RESEARCH METHODOLOGY

The methodology of the research study is defined as the way the data are gathered in order to answer the question to analyze the research problem. It enables the researcher to project a blue print of the research undertaken. The research methodology involves a systematic procedure by which a researcher has a start from the initial identification of the problem to its final conclusion.

The present study was conducted to assess the effectiveness of positions upon vital parameters among Preterm neonates. It deals with a brief discussion of different steps undertaken by the researcher for the study. It involves research approach, the setting population, sample and sampling technique, selection of the tool, content validity, reliability, pilot study, data collection procedure and plan for data analysis.

Research approach

Research approach is the most significant part of any research. The choice of the research approach depends on the purpose of research study which is undertaken.

According to Polit and Beck (2008) experimental research is an extremely applied form of research and involves finding out how well a program and practice of policy are working. Its goals are to assess or evaluate the success of the intervention. In this study the researcher wanted to assess the effectiveness of positions upon vital parameters among

preterm neonates. After review of various literatures the researcher found that the quasi-experimental approach was considered to be the most appropriate approach for the study.

Research Design

A research design incorporates the most important methodological design that a researcher works in conducting a research (Polit and Beck 2008).

A quasi-experimental type of alternating treatment design was selected for the preterm neonates and the investigator manipulated the independent variable, i.e., positions upon vital parameter which was administered to the same group of preterm neonates. After feeding the experiment started with the baby in right lateral position for one hour followed by supine for one hour and prone position for one hour was assigned. During each position vital parameters were recorded at 5 minutes, 30 minutes and 60 minutes interval daily for three days in the NICU. Finally the effectiveness of positions upon oxygen saturation was computed.

The research design is represented diagrammatically as follows

X_1 O_1 O_2 O3 X2 O_4 O_5 O6 X_3 O_7 O_8 O_9

X_1 - positioning the preterm neonate in lateral position for one hour

O_1 - observation of vital parameters at 5mts in lateral position

O_2 - observation of vital parameters at 30mts in lateral position

O_3 - observation of vital parameters at 60mts in lateral position

X_2 - positioning the preterm neonate in supine position for one hour

O_4 - observation of vital parameters at 5mts in supine position

O_5 - observation of vital parameters at 30mts in supine position

O_6 - observation of vital parameters at 60mts in supine position

X_2 - positioning the preterm neonate in prone position for one hour

O_{7-} - observation of vital parameters at 5mts in prone position

O_8 - observation of vital parameters at 30mts in prone position

O_9 - observation of vital parameters at 60mts in prone position

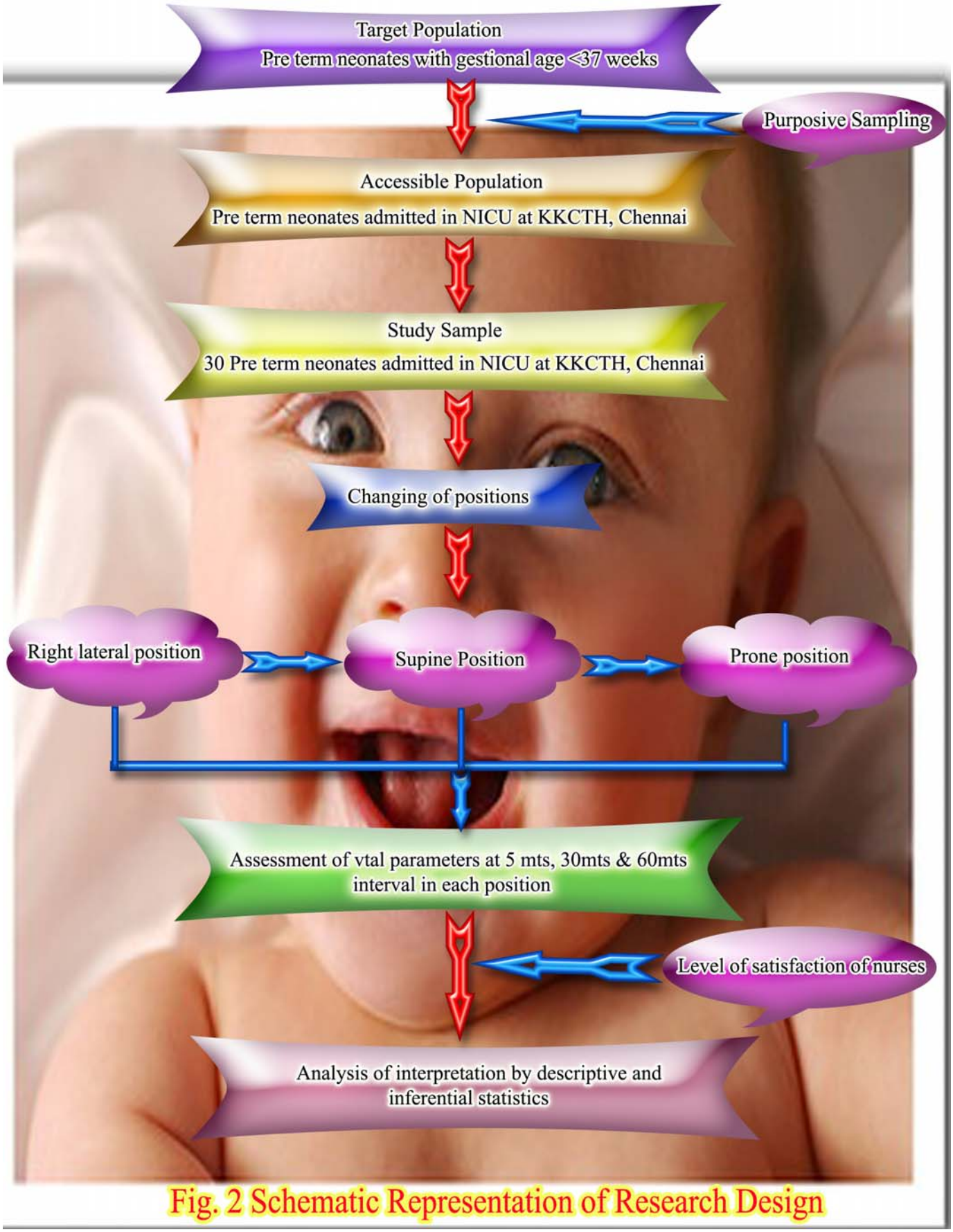

Fig. 2 Schematic Representation of Research Design

Research setting

The setting is physical location and condition in which data collection takes place in the study (Polit and Hungler, 2008).

The study was conducted at Kanchi Kamokoti Childs Trust Hospital (KKCTH) in Chennai. It is a 250 bedded private hospital. This hospital is well known for Child care. The hospital has OPD, Operation theatre, medical ward, surgical ward, isolation ward, neonatal ICU, PICU. The hospital is well equipped with life saving equipments and emergency medication, to manage newborn and child in emergencies. Around 200 nurses in the hospital round the clock. The staff patient ratio in NICU is 1:2 in every shift.

Population

Population is the entire aggregation of cases which meet designated set of criteria (Polit and Hungler, 2008). **The target population** for the present study were Preterm neonates, born before 37 weeks of gestation. **The accessible population** were Preterm neonates born before 37 weeks of gestation admitted in KKCTH, Chennai.

Sample

According to Polit and Beck (2004), a sample consists of a subset of the units which comprises the population. Sample size for the present study was 30 Preterm neonates born before 37 weeks of gestation who satisfied the inclusion criteria.

Sampling Technique

It was stated by Polit and Beck (2004), that sampling refers to the process of selecting a portion of the population to represent the entire population. The subjects of the present study were selected by non-probability purposive sampling technique in which 30 preterm baies were selected. In non probability purposive sampling technique the researcher selected participants who fulfilled the sampling criteria.

Sampling Criteria

Inclusion Criteria

The study included Preterm neonates who

- had a gestational age between 26 to 37 weeks.
- were stable.
- were in the age between 72 Hrs to 3 weeks during the study period
- were admitted in NICU
- recovered from high risk conditions

Exclusion Criteria

The study excluded Preterm neonates who

- had congenital disease.
- had complications like septic shock, pneumothorax.
- were on mechanical ventilation.
- had hypoglycemia
- were on oxygen therapy.

Selection and development of study instrument

The study aimed at evaluating the effectiveness of positions upon vital parameters. Data collection instruments were developed through extensive review of literature and consultation with experts and guidance of faculty members. The instruments used were, Neonatal variable proforma, demographic and obstetrical variable proforma, observational record sheet and rating scale on satisfaction of nurses regarding positions.

Neonatal variable proforma

Neonatal variable proforma consisted of the information of the preterm baby such as sample no, gender, Apgar score at birth, gestational age in weeks, birth weight in grams, present weight of preterm neonate and present age in days.

Obstetrical variable proforma

Obstetrical variable proforma consisted of the information regarding mother such as variables such as educational status of the mother, occupation, nature of the work, area of residence, family income per month, obstetrical variables such as gravida, number of antenatal checkup, number of TT immunization taken, parity and presence of maternal illness during antenatal period.

Observational record sheet

Observational record sheet consisted of the information regarding vital parameters like heart rate, respiration rate, temperature, blood pressure and oxygen saturation.

Rating scale on level of satisfaction

The rating scale on level of satisfaction regarding positions consisted of 15 statements. These statements were categorised into satisfaction regarding intervention in lateral, supine and prone position .The responses extended from highly satisfied (score=3), satisfied (score=2), to dissatisfied (score=1).

The rating scale scores were classified into 3 levels for each position as follows

Percentage		**Interpretation**
>75%	-	Highly satisfied
51%-75%	-	Satisfied.
< 50%	-	Dissatisfied.

Validity

Content validity is the degree to which the item in an instrument adequately represents the universe of the content (Polit and Beck, 2004). The constructed tool was given to five experts in the field of Nursing, one Paediatrician and one Neonatologist. The valuators had suggested some modification in obsetritical variable proforma and

observational record sheet. The modifications and suggestions of experts were incorporated in final preparation of tool.

Reliability

Reliability refers to the accuracy and consistency of measuring tool. Validity of the monitor was specified by the manufacture's instruction and same monitor was used throughout the study.

Reliability of the monitor was maintained by calibrating the meter according to manufacture's instruction.

Pilot Study

Pilot study is a miniature of some part of actual study, in which the instrument is administered to the subjects drawn from the same population. It is a small scale version done in preparation for a major study. (Polit and Hungler, 2004) .The purpose was to find out the feasibility and practicability of study design. A pilot study was conducted on five Preterm neonates and it was feasible to conduct the study.

Intervention protocol

After feeding the experiment started with the baby in right lateral position for one hour followed by supine for one hour and prone position for one hour was assigned. During each position vital parameters (temperature, heart rate, respiratory rate, blood pressure and

oxygen saturation) were recorded at 5 minutes, 30 minutes and 60 minutes interval daily for three days in the NICU.

Data collection procedure

Data collection is the gathering of information needed to address a research problem. The data was collected in the month of June from 04/067/10 to 30/06/10 in KKCTH, Chennai. After obtaining formal permission from Director of KKCTH, Head of the NICU department. The researcher got started with the data collection with the help of questionnaire and observational record sheet.

Thirty samples that satisfied the inclusion criteria were selected for the study. The researcher introduced herself and explained the purpose of the study to the mothers who were in the rest room near NICU. Consent was obtained from mothers and confidentiality was assured. Data collection procedure was explained to the staff nurses who were in the Neonatal Intensive care unit. The investigator collected data from 7.a.m to5 p.m. daily during the study period. The researcher collected demographic data from the medical records. After feeding the experiment started with the baby in right lateral position for one hour followed by supine for one hour and prone position for one hour was assigned. During each position vital parameters were recorded at 5 minutes, 30 minutes and 60 minutes interval daily for three days in the NICU. The level of satisfaction of nurses regarding positions was collected. Data was collected and interventions were given for 4 neonates per day for one month from 04/06/10 to 30/06/10.

Problems faced during the process of data collection

- Few staff nurses did not cooperative during data collection.
- Continuous observation for three hours was tiring to perform.

Plan for data analysis

Data analysis is the systematic organization and synthesis of research data and testing of research hypotheses by using the obtained data (Polit and Beck, 2007). Descriptive statistics like frequency distribution, percentage, mean and standard deviation and inferential statistics like repeated analysis of variance, ANOVA and chi-square were used to analyse the data.

Summary

This chapter has dealt with research approach design, setting, population and sample, sampling technique, inclusion, criteria, exclusion criteria, selection and development of study instruments, content validity, content reliability, pilot study, data collection procedure and plan for data analysis. In the following chapter analysis is interpreted by using descriptive and inferential statistics.

CHAPTER - IV

ANALYSIS AND INTERPRETATION

In this chapter the data collected from 30 Preterm neonates to assess the effectiveness of positions upon vital signs and oxygen saturation were presented. The data was analysed according to the objectives and hypotheses of the study. Data analysis was done manually after transferring the collected data into master coding sheet by the researcher using descriptive and inferential statistics.

Organization of Findings

The analysis of data was organised and presented under following headings,

- Frequency and Percentage Distribution of Neonatal Variables of preterm neonates.
- Frequency and Percentage Distribution of demographic and Obstetric Variables of mothers of preterm neonates.
- Comparison of Mean and Standard Deviation of vital parameters of preterm neonates in lateral, supine and prone position..
- Association between selected Neonatal Variables with the level of oxygen saturation of preterm neonates in lateral position.
- Association between selected Neonatal Variables with the level of oxygen saturation of preterm neonates in supine position.

- Association between selected Neonatal Variables with the level of oxygen saturation of preterm neonates in prone position.
- Repeated measure of analysis of variance of the mean heart rate, mean respiration rate, mean blood pressure and mean temperature between lateral, supine and prone position
- Frequency and percentage distribution of level of satisfaction of Nurses who cared the preterm neonates.

Table 1

Frequency and Percentage Distribution of Neonatal Variables of preterm neonates.

(N=30)

Sample Characteristics	Frequency (n)	Percentage(p)
Apgar score at birth		
≤ 3	8	26.7
4 – 6	13	43.3
7 – 10	9	30
Birth weight in grams		
≤ 1,500	17	56.7
1501 – 2000	5	16.7
> 2000	8	26.7
Present weight of preterm newborn in grams		
≤1500	19	63.3
1501-2000	3	10
>2000	8	26.7
Age in days		
1-7	12	40
8-14	9	30
15-21	9	30

It could be inferred from the above table that significant percentage had an Apgar score of 4-6 (43.3%) and most of the preterm neonates birth weight was ≤ 1500gms (56.7%) and forty percentage of preterm neonates were less than 7 days old.

Fig. 3 shows the percentage distribution of gender, majority of preterm neonates were boys (60%).

Fig. 4 reveals that most of preterm neonates were born between 26-29wks of gestation (56.7%).

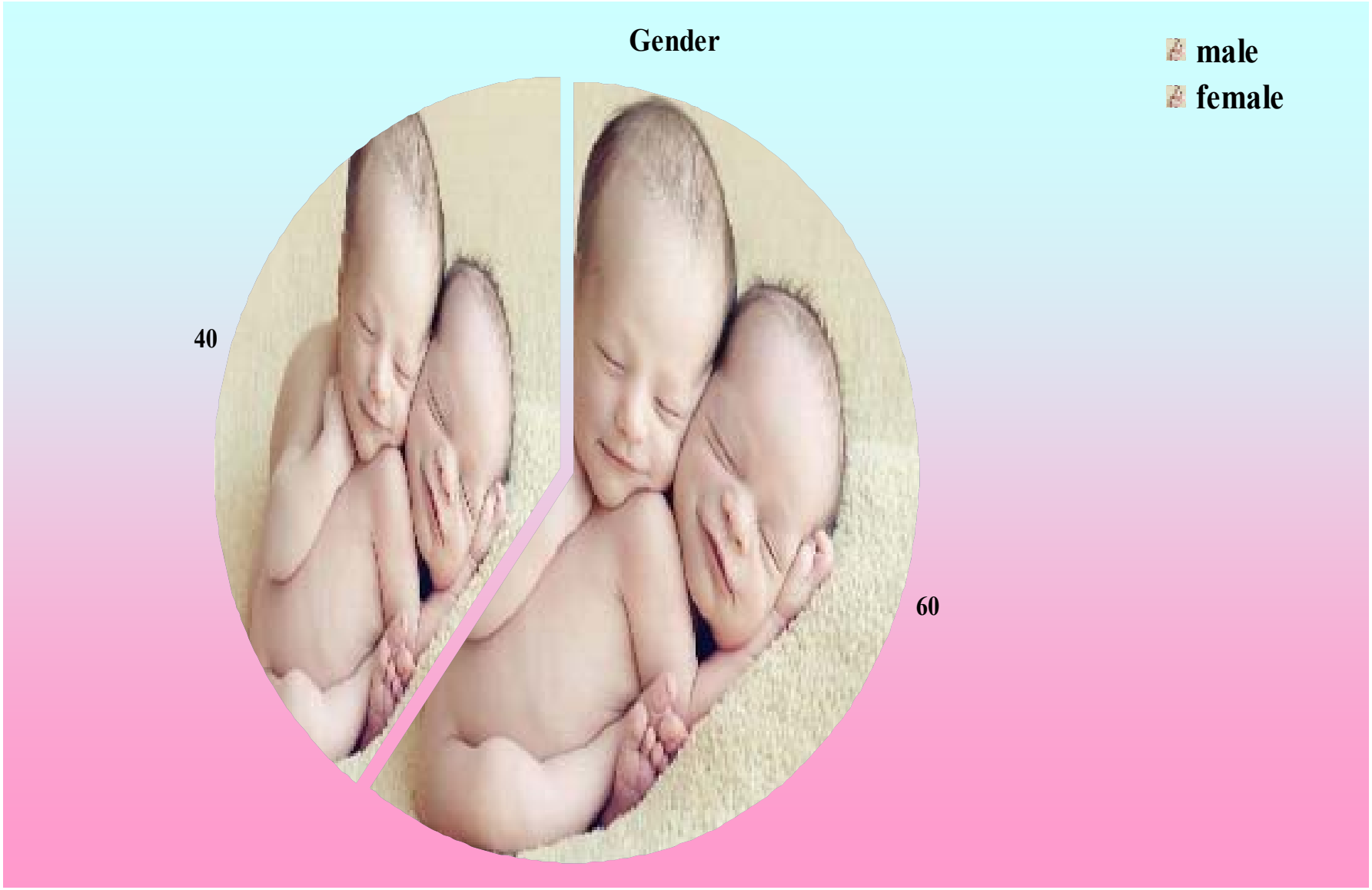

Fig. 3. Percentage distribution of gender of preterm neonates

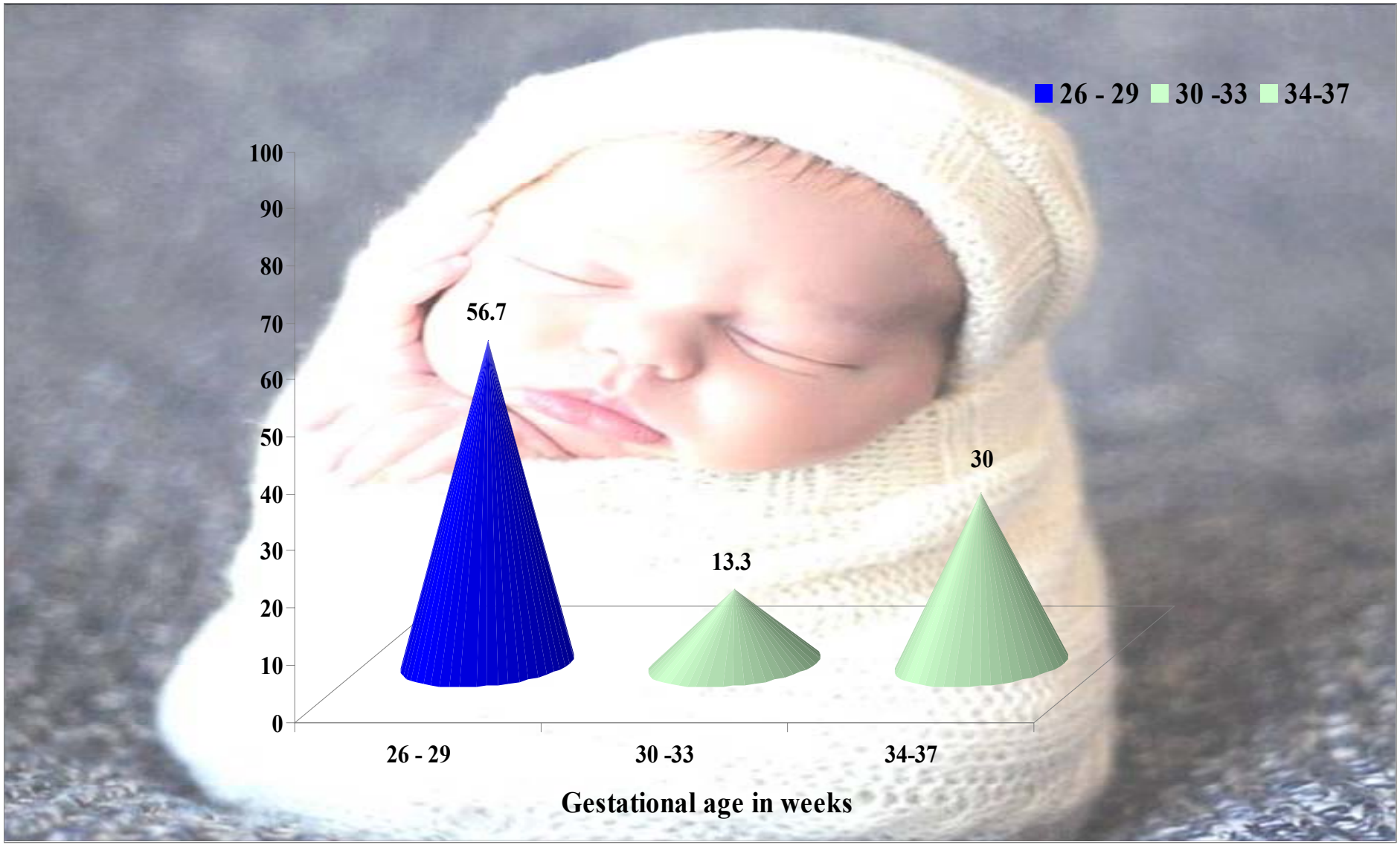

Fig.4. Percentage distribution of gestational age in weeks of preterm neonates

Table 2

Frequency and Percentage Distribution of demographic and Obstetric Variables of mothers of preterm neonates.

(N=30)

Obstetric Variables	Frequency (n)	Percentage (p)
Educational Status of the mother		
Illiterate	4	13.3
Primary Education	9	30
Secondary	2	6.7
Higher secondary	5	16.7
Graduate	7	23.3
Post graduate	3	10
Occupation		
Employed	10	33.3
Un- Employed	20	66.7
If employed, the nature of work		
Sedentary	18	60
Moderate	12	40
Area of Residence		
Urban	20	66.7
Rural	10	33.3
Family Monthly Income in Rupees		
Rs Less than 3,000	9	30
Rs 3,001-5,000	10	33.3
Rs 5,001-10,000	10	33.3
Rs Above 10,000	1	3.3
Gravida		
Primi	22	73.3
Multi	8	26.7
TT immunisation taken		
1 dose	4	13.3
2 dose	26	86.7
Parity		
Primi	22	73.3
Multi	8	26.7

Table 2 shows that majority of the mothers of had received 2 doses of tetanus toxoid (86.7%). Most of the mothers were primi (73.3%) and they were unemployed (66.7%). Significant percentage of them had primary education (30%).

Fig. 5.shows that most of the mothers had at least two antenatal visits (63.3%) and significant percentage of them had more than 3 antenatal visits (23.3%).

Fig.6. reveals that significant percentage of mothers had anemia (33.3%), hypertension (23.3%), diabetes mellitus (16.7%), history of preterm labour (13.3%), infections (10%) and antepartum hemorrhage (3.3%) during antenatal period.

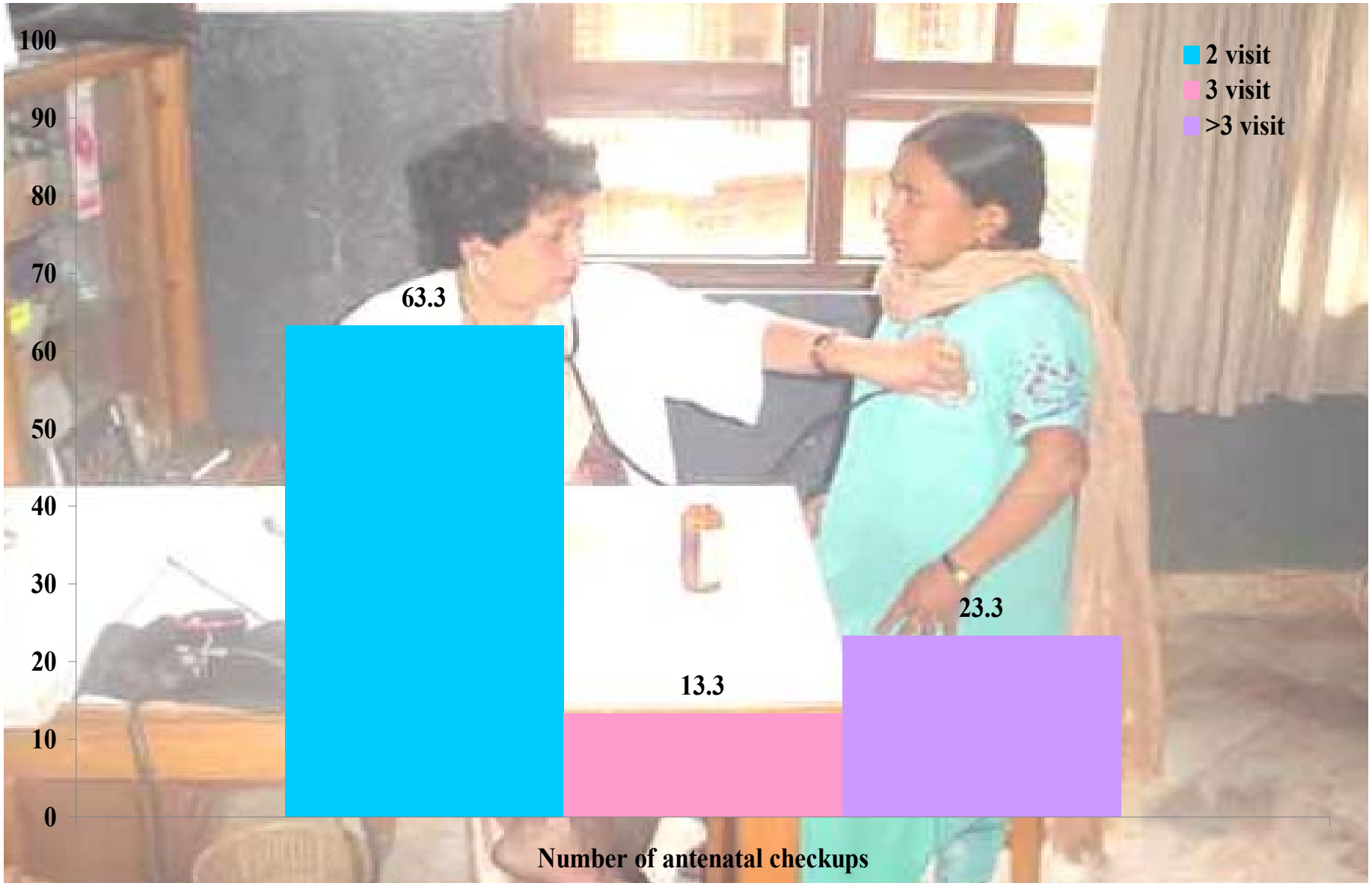

Fig. 5. Percentage distribution of number of antenatal checkups

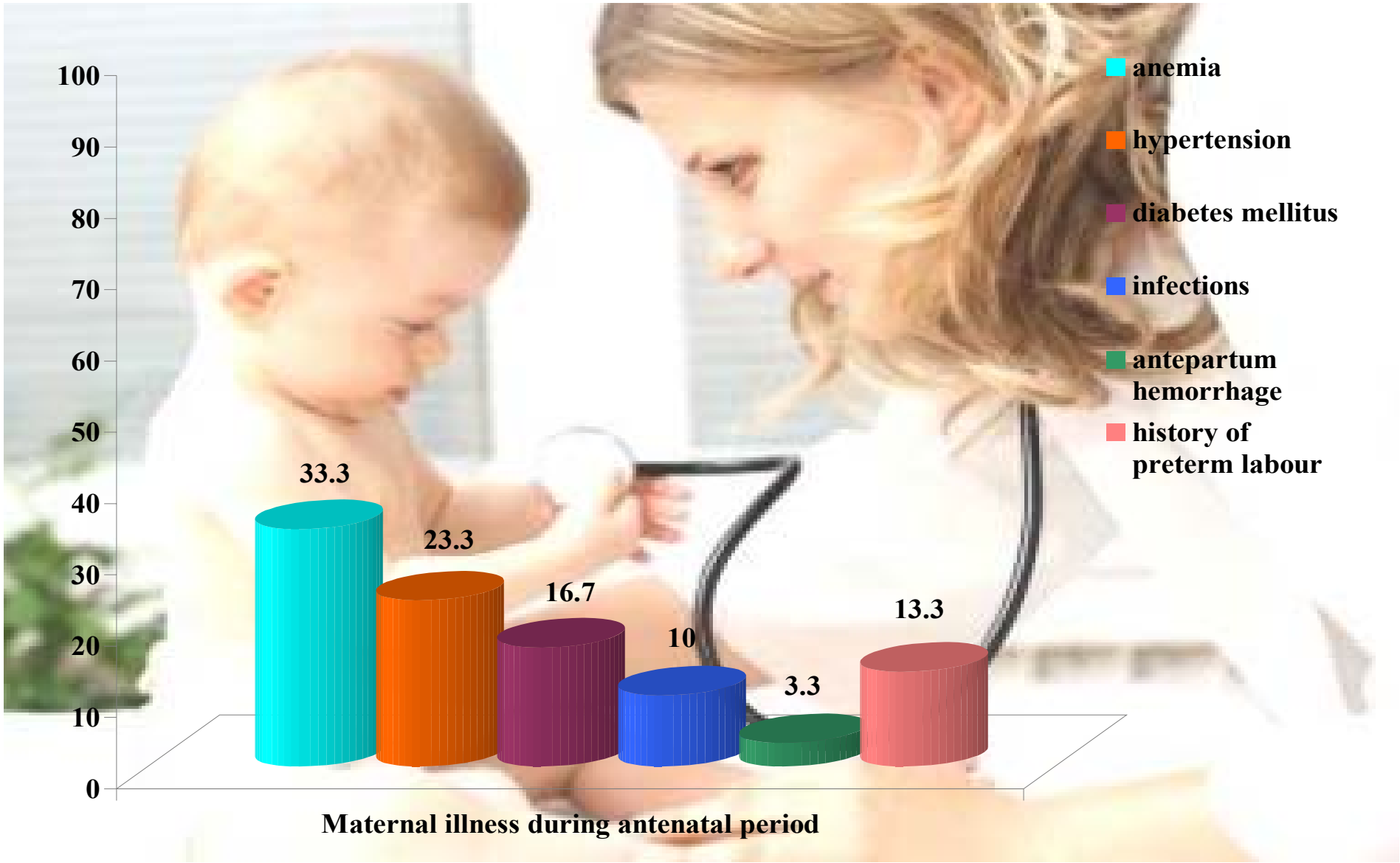

Fig. 6. Percentage distribution of presence of maternal illness during antenatal period

Table 3

Comparison of Mean and Standard Deviation of vital parameters of preterm neonates in Lateral, supine and prone position.

(N=30)

Group	Observation	M	SD	F value
Lateral				
Heart Rate	5 mts	150.11	5.11	42.10***
	30 mts	148.77	4.40	
	60 mts	147.33	3.34	
Blood Pressure	5 mts	42.90	1.49	6.07
	30 mts	41.60	0.69	
	60 mts	41.83	1.59	
Oxygen Saturation	5 mts	94.16	2.18	81.16****
	30 mts	95.77	1.46	
	60 mts	97.11	1.13	
Supine				
Heart Rate	5 mts	150.11	5.11	42.10***
	30 mts	148.77	4.40	
	60 mts	147.33	3.34	
Blood Pressure	5 mts	46.95	3.09	25.98***
	30 mts	45.83	2.71	
	60 mts	43.88	3.33	
Oxygen Saturation	5 mts	92.05	1.79	76.02***
	30 mts	93.94	0.94	
	60 mts	95.22	0.57	
Prone				
Heart Rate	5 mts	148.55	1.89	740.16***
	30 mts	146.22	1.44	
	60 mts	142.22	1.33	
Blood Pressure	5 mts	47.21	2.24	15.92***
	30 mts	45.25	3.33	
	60 mts	45.16	3.54	
Oxygen Saturation	5 mts	95.94	0.86	293.59***
	30 mts	97.11	0.72	
	60 mts	98.33	0.33	

***P< 0.001

It could be inferred from table 3 that Among the preterm neonates assessed at 5, 30&60mts the mean heart rate of them was between 150.11 to 147 b/mt in lateral position,

150.11 to 147.33 b/mt in supine position and 148.55 to 142.22 b/mt in prone position. Their mean arterial pressure found to be between 42.9 to 41.83 mmHg in lateral position, 46.95 to 43.88 mmHg in supine position and 47.21 to 46.16 mmHg in prone position.

Fig.7. shows that among preterm neonates the mean temperature assessed at 5, 30 and 60mts was between 35.66 to 35.88° C in lateral position, 35.38 to 35.48^0C in supine position and 35.60 to 35.66^0 C in prone position. Preterm neonates in lateral position and in prone position had higher mean temperature than in supine position.

Fig.8. reveals that among preterm neonates mean respiratory rate assessed at 5, 30 and 60mts ranged between 45.66 to 43.22 b/mt in lateral position, 50.44 to 47.33b/mt in supine position and 43.77 to 40.55 b/ mt in prone position.

Fig.9. reveals that the mean oxygen saturation of preterm neonates assessed at 5, 30 and 60mts ranged from 94.16% to 97.11% in lateral position, 92.05% to 95.72% in supine position and 95.94% to 98.33% in prone position. These results can be attributed to the effectiveness of positions with statistical significant at $P<0.001$. Thus the null-hypotheses Ho1 was rejected.

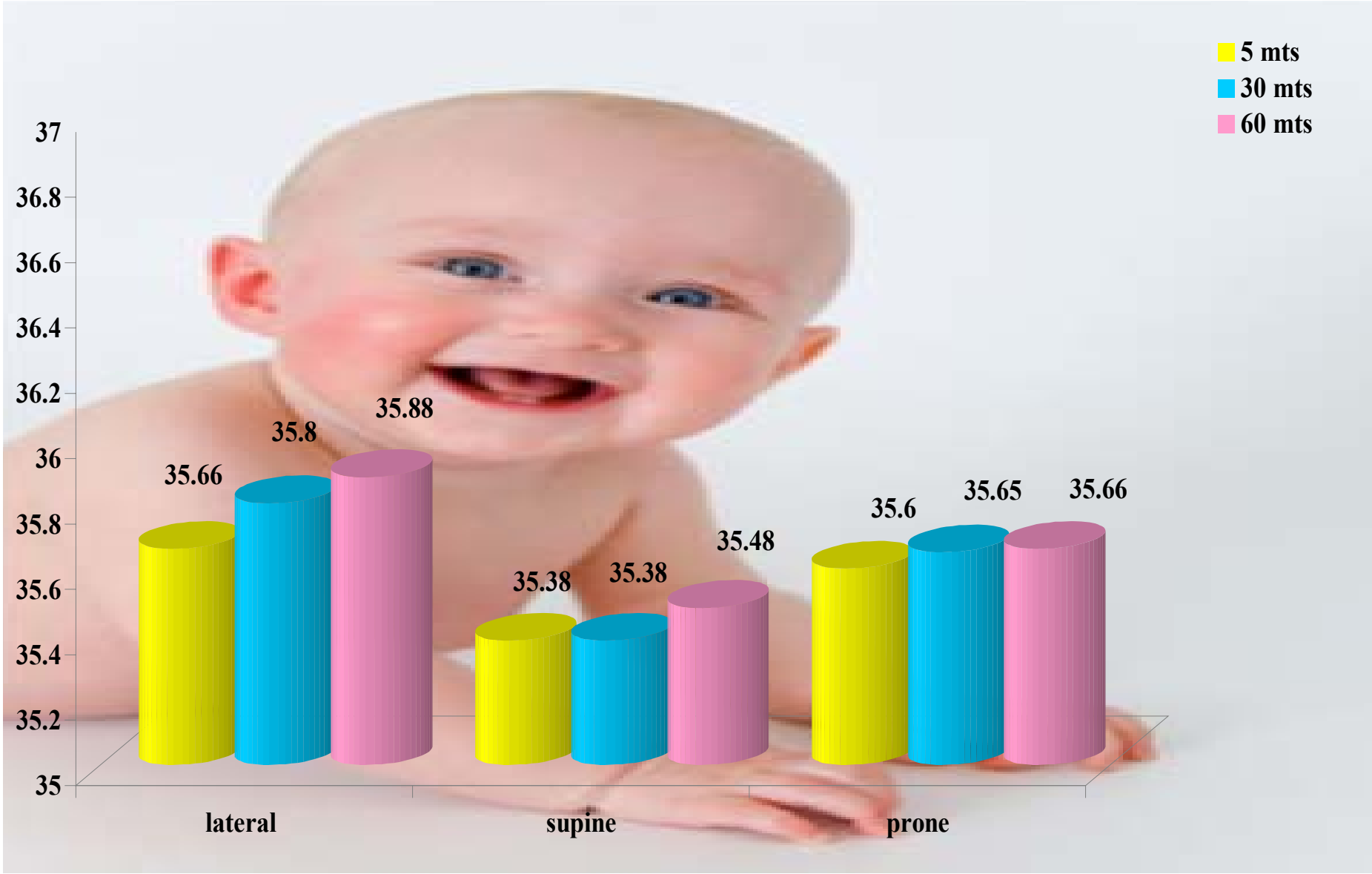

Fig. 7. Comparison of mean temperature of preterm neonates between lateral, supine and prone position

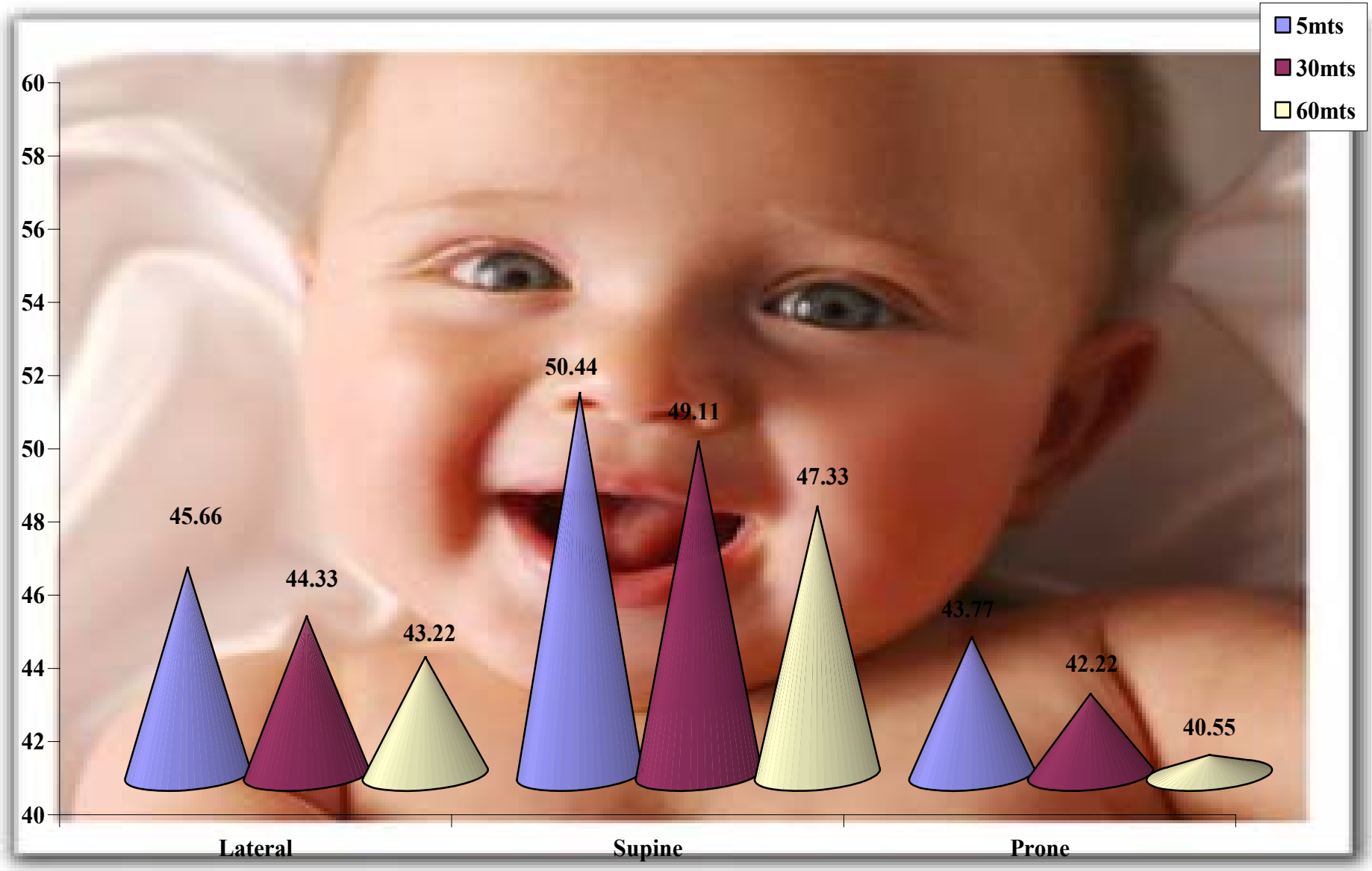

Fig. 8. Comparison of mean respiration rate of preterm neonates between lateral, supine and in prone position

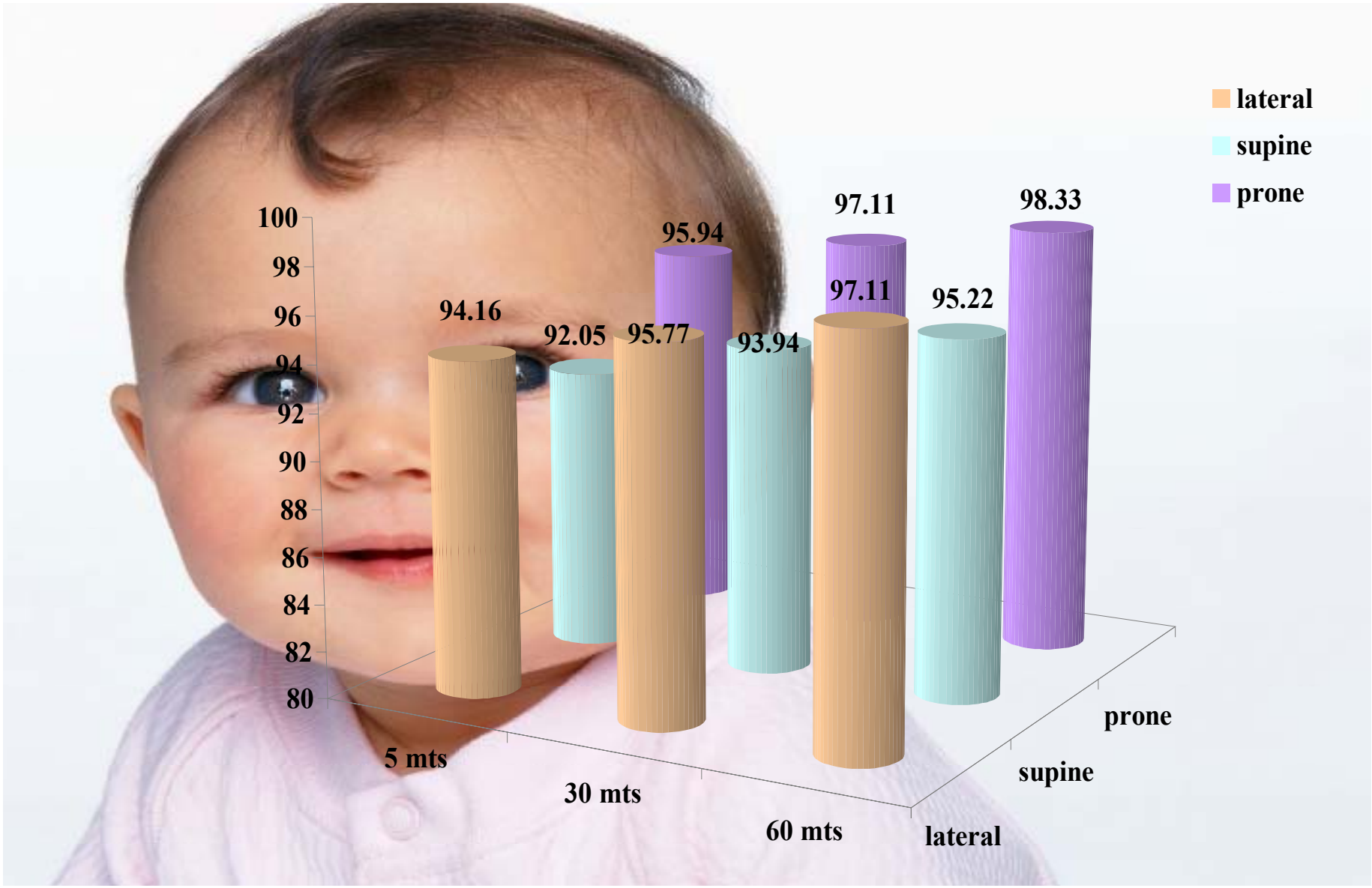

Fig. 9. Comparison of mean oxygen saturation of preterm neonates between lateral, supine and in prone position

Table 4

Association between selected Neonatal Variables with the level of oxygen saturation of preterm neonates in lateral position.

(N=30)

Sample Characteristics	Lateral position	Oxygen saturation				χ^2
		Moderate		Adequate		
		n	p	n	p	
Gender						
Male	5 mts	6	20	12	40	5
Female		9	40	3	10	df =1
Male	30 mts	4	13.3	14	46.7	2.5
Female		6	20	6	20	df =1
Apgar score at birth						
≤ 3	5 mts	4	13.3	4	13.3	0.18
4 – 6		6	20	7	23.3	df=2
7 – 10		5	16.7	4	13.3	
≤ 3	30 mts	2	6.7	6	20	0.78
4 – 6		4	13.3	9	30	df=2
7 – 10		4	13.3	5	16.7	
Gestational age in weeks						
26 – 29	5 mts	6	20	11	36.7	0.15
30 – 33		1	3.3	3	10	df=2
34 – 37		3	10	6	20	
Birth weight in grams						
≤ 1,500	5 mts	8	26.7	9	30	0.75
1501 – 2000		2	6.7	3	10	df=2
> 2000		5	16.7	3	10	
≤ 1,500	30 mts	4	13.3	13	43.3	1.83
1501 – 2000		2	6.7	3	10	df=2
> 2000		4	13.3	4	13.3	
Present weight of preterm newborn in grams						
≤1500	5 mts	5	16.7	14	46.7	1.42
1501-2000		1	3.3	2	6.7	df=2
>2000		4	13.3	4	13.3	

Age in days						
1-7	5 mts	5	16.7	7	23.3	0.55
8-14		5	16.7	4	13.3	df=2
15-21		5	16.7	4	13.3	
1-7	30 mts	4	13.3	8	26.7	1.00
8-14		4	13.3	5	16.7	df=2
15-21		2	6.7	7	23.3	

It could be inferred from table 4 that there was a no significant association between the selected neonatal variables namely, gender, Apgar score, gestational age , birth weight age in days and the oxygen saturation of Preterm neonates in lateral positions at the level of confidence at $p<0.05$; hence the hypotheses Ho2 was accepted.

Table 5

Association between selected Neonatal Variables with the level of oxygen saturation of preterm neonates in supine position.

(N=30)

Sample Characteristics	Supine position	Oxygen saturation				χ^2
		Moderate		Adequate		
		n	p	n	p	
Gender						
Male	30 mts	14	46.7	4	13.3	1
Female		11	36.7	1	3.3	df=1
Male	60 mts	8	26.7	10	33.3	2.5
Female		2	6.7	10	33.3	df=1
Apgar score at birth						
≤ 3	30 mts	7	23.3	1	3.3	3.76
4 – 6		9	30	4	13.3	df=2
7 – 10		9	30	0	0	
≤ 3	60 mts	2	6.7	6	20	0.78
4 – 6		4	13.3	9	30	df=2
7 – 10		4	13.3	5	16.7	
Gestational age in weeks						
26 – 29	5 mts	8	26.7	9	30	0.17
30 – 33		2	6.7	2	6.7	df=2
34 – 37		5	16.7	4	13.3	
26 – 29	30 mts	4	13.3	13	43.3	1.73
30 – 33		2	6.7	2	6.7	df=2
34 – 37		4	13.3	5	16.7	
26 – 29	60 mts	5	16.7	12	40	0.73
30 – 33		1	3.3	3	10	df=2
34 – 37		4	13.3	5	16.7	
Birth weight in grams						
≤ 1,500	30 mts	13	43.3	4	13.3	2.21
1501 – 2000		4	13.3	1	3.3	df=2
> 2000		8	26.7	0	0	
≤ 1,500	60 mts	5	16.7	12	40	0.28
1501 – 2000		2	6.7	3	10	df=2
> 2000		3	10	5	16.7	

Present weight of preterm newborn in grams						
≤1500	30 mts	14	46.7	5	16.7	3.47
1501-2000		3	10	0	0	df=2
>2000		8	26.7	0	0	
≤1500	60 mts	6	20	13	43.3	0.08
1501-2000		1	3.3	2	6.7	df=2
>2000		3	10	5	16.7	
Age in days						
1-7	30 mts	9	30	3	10	1.00
8-14		8	26.7	1	3.3	df =2
15-21		8	26.7	1	3.3	
1-7	60 mts	5	16.7	7	23.3	0.87
8-14		2	6.7	7	23.3	df =2
15-21		3	10	6	20	

It could be inferred from table 5 that there was no significant association between the selected neonatal variables namely, gender, Apgar score, gestational age , birth weight, age in days and the oxygen saturation of Preterm neonates in supine positions at the level of confidence $p<0.05$; hence the hypotheses Ho2 was accepted.

Table 6

Association between selected Neonatal Variables with the level of oxygen saturation of preterm neonates in prone position.

(N=30)

Sample Characteristics	Prone position	Oxygen saturation				χ^2
		Moderate		Adequate		
		n	p	n	p	
Gender						
Male	5 mts	3	10	15	50	5.62
Female		7	23.3	5	16.7	df=1
Apgar score at birth						
≤ 3	5 mts	3	10	5	16.7	0.10
4 – 6		4	13.3	9	30	df=2
7 – 10		3	10	6	20	
Gestational age in weeks						
26 – 29	30 mts	13	43.3	4	13.3	2.56
30 – 33		3	10	1	3.3	df=2
34 – 37		9	30	0	0	
26 – 29	60 mts	5	16.7	12	40	0.74
30 – 33		1	3.3	3	10	df=2
34 – 37		4	3.3	5	16.7	
Birth weight in grams						
≤ 1,500	5 mts	6	20	11	36.7	0.49
1501 – 2000		1	3.3	4	13.3	df=2
> 2000		3	10	5	16.7	
Present weight of preterm newborn in grams						
≤1500	5 mts	6	20	13	43.3	0.08
1501-2000		1	3.3	2	6.7	df=2
>2000		3	10	5	6.7	
Age in days						
1-7	5 mts	2	6.7	10	33.3	3.50
8-14		5	16.7	4	13.3	df =2
15-21		3	10	6	20	

It could be inferred from table 6 that there was no significant association between the selected neonatal variables namely, gender, Apgar score, gestational age, birth weight age in days and the oxygen saturation of Preterm neonates in prone positions at the level of confidence at $p<0.05$; hence the hypotheses Ho2 was accepted.

Table 7

Repeated measure of analysis of variance of the mean heart rate, mean respiration rate, mean blood pressure and mean temperature between lateral, supine and prone position.

(N=30)

Variables	Observation	Anova	Sum of squares	Mean squares	F Value
Temperature	5 mts	Between groups	1.31	0.65	16.80***
		Within groups	3.40	0.03	
	30 mts	Between groups	2.67	1.33	23.17***
		Within groups	5.01	0.05	
	60 mts	Between groups	2.40	1.20	12.38***
		Within groups	8.45	0.09	
Heart rate	5 mts	Between groups	704.13	352.06	21.22***
		Within groups	1443.09	16.58	
	30 mts	Between groups	886.39	443.19	36.31***
		Within groups	1061.86	12.20	
	60 mts	Between groups	1310.62	655.31	80.53***
		Within groups	707.89	8.13	
Respiration	5 mts	Between groups	708.33	354.16	40.04***
		Within groups	769.40	8.84	
	30 mts	Between groups	747.54	373.77	57.60***
		Within groups	564.55	6.48	
	60 mts	Between groups	698.90	349.45	50.03***
		Within groups	607.58	6.98	
Blood pressure	5 mts	Between groups	351.07	175.53	31.31***
		Within groups	487.71	5.60	
	30 mts	Between groups	315.83	157.91	25.01***
		Within groups	549.34	6.31	
	60 mts	Between groups	169.60	84.80	9.698***
		Within groups	760.77	8.74	

*****P<0.001**

The data from table 7 revealed that the result of analysis of variance revealed that vital parameters among preterm neonates between three positions varied significantly. This finding was not consistent with the Ho1 hence the null hypotheses Ho1 was rejected.

Table 8

Frequency and percentage distribution of level of satisfaction of nurses who cared the preterm neonates.

(N=25)

Level of Satisfaction	Positions					
	Lateral		Supine		Prone	
	n	p	n	p	n	p
Highly Satisfied	5	20	-	-	15	60
Satisfied	-	-	5	20	-	-
Dissatisfied	-	-	-	-	-	-

The data from table 8 revealed that most of nurses had highly satisfied (60%) with the prone position. A significant percentage of them were highly satisfied (20%) with the lateral position and 20% of them were satisfied with the supine position.

Summary

This chapter dealt with analysis and interpretation of the data obtained by researcher. The analysis showed that positioning of preterm neonates improved vital parameters. This implemented that positions had the positive effect on Preterm neonates.

CHAPTER - V

DISCUSSION

A quasi-experimental study to assess the effectiveness of positions upon the vital parameters among preterm neonates admitted in NICU at selected hospital, Chennai.

The objectives of the study were,

1. To determine the effectiveness of positions upon the vital parameters among preterm neonates.
2. To compare the effectiveness of various positions upon the vital parameters among preterm neonates.
3. To find out the association between the selected neonatal variables and the level oxygen saturation among preterm neonates.
4. To assess the level of satisfaction of the nurses regarding effect of positions upon the vital parameters among preterm neonates.

The study was carried among 30 Preterm neonates in Kanchi Kamokoti Childs Trust Hospital, Chennai. The effectiveness of positions (lateral, supine and prone positions) upon vital parameters was assessed among preterm neonates.

The objective of the study was to determine and compare the effectiveness of positions upon vital parameters among pre term neonates in lateral, supine and prone position

Among the preterm neonates assessed most of them were males (60%), the gestational age at birth was between 26- 29 weeks (56.7%) and they born with the birth

weight of ≤ 1,500grams. Significant percentage of them had an Apgar score of 4- 6 (43.3%), and 40% of them were less than 7 days old. The researcher assumes that apnea was common in preterm neonates mainly with the gestational age less than 34 weeks because of immature growth of the respiratory control centre in the medulla.

The present study findings is supported by Wong (2006) that the preterm neonates has prolonged respiratory pauses of more than 20 seconds, with cyanosis and decreased heart rate to less than 100 beats per minute. Apnea of preterm usually occurs in the preterm neonates with gestational age less than 34 weeks. Symptom onset is in 1-2 days and improvement occurs or recovers when the gestational age is 37 weeks.

In the present study majority of the mothers had received 2 doses of tetanus toxoid (86.7%). Most of them were primi (73.3%), had atleast 2 antenatal visits(63.3%) and were unemployed (66.7%) living in urban area (66.7%).Significant percentage of them had primary education (30%). Among them had anemia during pregnancy 33.3%. It is consistent with research findings of Badshah (2008) that maternal anaemia adversely affects the incidence of preterm delivery.

As they live in nuclear family in urban area, the chance of decreased attention could have contributed to less intake of iron rich diet and leading to anaemia. It is an important responsibility for nurses to identify mothers who are at risk of anaemia during antenatal visits and educate them on importance of iron rich foods.

Thus we could prevent the incidence of maternal morbidity due to post partum haemorrhage and infant mortality and morbidity due to Preterm delivery which in turn helps in achieving millennium development goal 4 of reducing child mortality and goal

5 to improve maternal health**.** Thus maternal anaemia contributes to greater incidence preterm neonates.

Among the preterm neonates the mean temperature assessed at 5, 30&60mts ranged between 35.66 to 35.88° C in lateral position, 35.35 to 35.48^{0}C in supine position and 35.60 to 35.66^0 C in prone position. The findings of this study showed significant difference in skin temperature between lateral position, supine and prone position ($P<0.001$). Preterm neonates in lateral position and in prone position had higher mean skin temperature than in supine position.

The preterm neonates have limited ability to control body temperature and are extremely susceptible to hypothermia. The findings of the study found that preterm neonates in lateral position and in prone position had higher mean skin temperature than in supine position due to the decreased body surface area to the external environment. Further more, positioning preterm neonates in lateral and prone positioning can promote better functioning of circulatory system resulting in using less energy, and better control of body temperature.

This study findings consistent with the studied of Khumsriboos and associates (1991) which was aimed to determine body temperature of preterm neonates who were positioned in a supine with flexion position with rolled blanket around the body, compared skin temperature and auxiliary temperature. The result of the studied demonstrated that preterm neonates were able to control body temperature that the normal level (37^{o}C), and maintain skin temperature between 36.7^{o}C to36.8^{o}C.

Furthermore, air temperature was decreased from 36.6^0C to35.4^0C within 2 hours and to 35.2^oC respectively, with the maintenance of body temperature between 36.9^oC to 37 ^{o}C.

The mean heart rate of preterm neonates assessed at 5, 30 & 60mts ranged between 150.11 to 147 b/mt in lateral position, 150.11 to 147.33 b/mt in supine position and 148.55 to 142.22 b/mt in prone position. The findings of this study showed significant difference in heart rate between lateral position, supine and prone position ($P<0.001$). Preterm neonates in prone position maintained within the normal limit. But in other positions slightly increased rate of heart rate was observed. The researcher report that fall in B.P. is compromised by increase in heart rate. This finding of the study was supported by the study conducted by Stephanie.R.Yillallou (2001) to assess the effects of sleeping position on development of infant cardiovascular control.

The mean respiratory rate of preterm neonates assessed at 5,30&60mts ranged between 45.66 to 43.22 b/mt in lateral position, 50.44 to 47.33b/mt in supine position and 43.77 to 40.55 b/ mt in prone position. The findings of this study showed significant difference in respiratory rate in different positions at $P<0.001$.The researcher observed that preterm neonates in prone position maintained slightly lower respiratory rate than in the other positions. This finding of the study was supported by the study conducted by Fitzerald (2005) to compare the effect of supine and prone position on preterm with acute respiratory distress children who found that preterm neonates are comfortable when they are lying on the prone since rapid rates of breathing with respiratory distress was slightly lower in the prone position.

The mean arterial pressure of preterm neonates assessed at 5, 30 & 60mts ranged between 42.9 to 41.83 mmHg in lateral position, 46.95 to 43.88 mmHg in supine position and 47.21 to 46.16 mmHg in prone position. The findings of this study showed significant difference in mean arterial pressure in different positions ($P<0.001$).The researcher observed that preterm neonates in lateral position maintained slightly lower mean arterial pressure than in the other positions.

The study findings revealed that the mean oxygen saturation of preterm neonates assessed ranged from 94.16% to 97.11% in lateral position, 92.05% to 95.72% in supine position and 95.94% to 98.33% in prone position. The findings of this study showed significant difference in level of oxygen saturation in lateral position, supine and prone position ($P<0.001$).The researcher observed that preterm neonates in prone position maintained slightly higher oxygen saturation level compared to the other position.

The result revealed that the most appropriate position of preterm neonates is prone position. In certain cases, where the neonates cannot be placed in prone position during mechanical ventilation a side lying i.e. lateral positioning is recommended. In side-lying position, the dependent lung is best ventilated. A change in lung volume is related to differences in intrapleural pressure that results from the effects of gravity and the weight of the lung as it moves downward in the chest cavity. During full inspiration, there is greater chest expansion, which results in decrease in intrapleural pressure at the base of the lung, so that the airway remain open and air preferentially moves into that portion of the lung.

This finding are also consistent with the findings of Chang and associates (2002) in which they demonstrated that in prone position, the preterm neonates had higher oxygen saturation, fewer episodes of oxygen desaturation, and less motor activity than in supine position. This study shows that the occurrence of episodes of apnea many times happened in supine position.

The result of analysis of variance revealed that vital parameters among preterm neonates between three positions varied significantly. This finding was not consistent with the Ho1: hence the null hypotheses was rejected.

The third objective of the study was to find out the association between selected Neonatal Variable with the level of oxygen saturation of Pre-term neonates in lateral position, supine position and prone position

There was no significant association between the selected neonatal variables namely, gender, Apgar score, gestational age , birth weight age in days and the oxygen saturation of Preterm neonates in different positions at the level of confidence at $p<0.05$; hence the hypotheses Ho2 was accepted.

The fourth objective of the study to assess the level of satisfaction of Nurses who cared the Pre-Term Neonates

The study findings revealed that most of the nurses (60%) were highly satisfied with the prone position. This finding is consistent with the finding of Aris(2006) study that NICU nurses' knowledge and discharge teaching related to infant sleep position and risk of SIDS in which most of the nurses (65%) were recommended prone position for

preterm during hospitalization, significant percentage of them (29%) recommended supine position after discharge. Nurses need evidence-based practice in managing the children with Preterm weight. The researcher concluded that positioning of preterm neonates is a basic task of neonatal nursing care. Prone position is helpful for improvement of arterial oxygen saturation improved lung and chest wall synchrony of respiratory movements, decreased incidence of apnea in babies with a clinical history of apnea, promoted sleep and decreased gastro esophageal reflux. The investigator found that preterm neonates were quite comfortable when they are lying in prone, since rapid rate of breathing with respiratory distress was slightly lower in the prone position might be the reason for this findings.

Summary

This chapter has dealt with the discussion of findings in the present study which includes neonatal variables, demographic and obstetrical variables of mothers, effectiveness of positions upon vital signs and oxygen saturation among preterm neonates, association between selected neonatal variable with the level of oxygen saturation in lateral and supine and prone positions, level of satisfaction of nurses ,repeated measures of vital signs and oxygen saturation between the positions with the help of an extensive review of literature.

CHAPTER - VI

SUMMARY, CONCLUSION, IMPLICATION AND RECOMMENDATION

The heart of the research project has in reporting the findings. This is the most creative demonstrating part of the study. This chapter deals with summary of this study findings, conclusion, implications and recommendations.

A quasi-experimental study was conducted to assess the effectiveness of positions upon vital parameters among preterm neonates admitted in NICU at selected hospital, Chennai.

The objectives of the study were,

1. To determine the effectiveness of positions upon the vital parameters among preterm neonates
2. To compare the effectiveness of various positions upon the vital parameters among preterm neonates.
3. To find out the association between the selected neonatal variables and the level of oxygen saturation among preterm neonates.
4. To assess the level of satisfaction of the nurses regarding effect of positions upon the vital parameters among preterm neonates.

Null Hypotheses

Ho1: There will be no significant difference in vital parameters between the positions.

Ho2: There will be no significant association between the selected neonatal variables and level of oxygen saturation in various positions among preterm neonates.

The conceptual framework was based on This Al's synactive theory was modified for the present study. An intensive review of literature and guidance by experts laid the foundation to the development of neonatal variable proforma, demographic and obstetrical variable proforma, observational checklist and rating scale on level of satisfaction of nurses.

A quasi experimental research approach with alternating treatment design was used to achieve objectives of the study. The present study was conducted in Kanchi Kamakoti Childs Trust Hospital in Chennai, with the sample size of 30, selected through non-probability purposive sampling technique

The data collection tools were validated and reliability was established. After the pilot study, the data collection of the main study was done using the validated tool. The relevant data was collected then positioning was done to preterm neonates then the data was collected after the administration of each position. The collected data were analyzed.

The major findings of the study

The major findings of the study were

Neonatal variables

The study findings reveals that among the preterm neonates assessed most of them were males (60%) and they were born between 26-29 weeks of gestation (56.7%) who had birth weight of ≤ 1500gms. Significant percentage of them had an Apgar score of 4-6 (43.3%) and 40% were less than 7 days old.

Demographic and obstetrical variables

Majority of the mothers had received 2 doses of tetanus toxoid (86.7%). Most of the mothers were primi (73.3%) and they were unemployed (66.7%). Most of them were living in urban residence (66.7%) and had a sedentary nature of work (60%). Among them had at least two antenatal visits (63.3%). Significant percentage of them had primary education (30%) and 33.3% of them had anemia during pregnancy.

Effectiveness of positions

Comparison of mean vital parameters among preterm neonates in lateral, supine and positions

Among preterm neonates the vital parameters were assessed at 5, 30 and 60mts mean temperature was between 35.66 to 35.88° C in lateral position, 35.38 to 35.48^0C in supine position and 35.60 to 35.66^0 C in prone position. Preterm neonates in lateral position and in prone position had higher mean temperature than in supine position. The mean heart rate of them was between 150.11 to 147 b/mt in lateral position, 150.11 to

147.33 b/mt in supine position and 148.55 to 142.22 b/mt in prone position. The mean respiratory rate was ranged between 45.66 to 43.22 b/mt in lateral position, 50.44 to 47.33b/mt in supine position and 43.77 to 40.55 b/ mt in prone position.

Their mean arterial pressure found to be between 42.9 to 41.83 mmHg in lateral position, 46.95 to 43.88 mmHg in supine position and 47.21 to 46.16 mmHg in prone position. The mean oxygen saturation of preterm neonates ranged from 94.16% to 97.11% in lateral position, 92.05% to 95.72% in supine position and 95.94% to 98.33% in prone position. The result of analysis of variance revealed that vital parameters among preterm neonates between three positions varied significantly at $P<0.001$. The findings of this study showed significant difference in vital parameters in lateral position, supine and prone position ($P<0.001$). These results can be attributed to the effectiveness of positions with statistical significant at $P<0.001$. Thus the null-hypotheses Ho1 was rejected.

Association between selected neonatal variables with the level of oxygen saturation of preterm neonates in lateral position, supine position and prone position

There was no significant association between the selected neonatal variables namely, gender, Apgar score, gestational age , birth weight age in days and the oxygen saturation of Preterm neonates in different positions at the level of confidence at $p<0.05$; hence the hypotheses Ho2 was accepted.

Level of satisfaction of nurses who cared the preterm neonates.

The study findings revealed that most of the nurses (60%) were highly satisfied with the prone position. Significant percentage of them (20%) were highly satisfied with lateral position and 20% of them were satisfied with supine position.

Conclusion

The findings of this study indicated that preterm neonates need immediate attention to prevent them from morbidity and mortality. Neonatal intensive care unit nurses play important role in meeting the basic needs of the preterm neonates, the excavated results supported that prone and lateral positions are appropriate for preterm neonates to facilitate the optimal outcome of ventilation and development. However supine position is necessary for neonates who are intubated.

Implications

The findings of the study has implications in different branches of nursing profession, i.e. nursing practice, nursing education, nursing administration and nursing research. By assessing the effectiveness of positions we get a clear picture regarding different steps to be taken in all these fields, to improve the standards of nursing profession.

Nursing Practice

Nurses as team leaders can plan and co ordinate activities for betterment of preterm neonates. They can plan and formulate strategies regarding positioning neonate will have energy expenditure, increased oxygen consumption, and change in stability. Prolong supine position may contribute to the shoulder retraction, neck hyper extension,

and abducted, extremely rotated extremities. Positioning neonates in lateral and in prone position is effective intervention for increasing oxygen saturation and temperature control. In critical period supine position is necessary for preterm neonates with assisted ventilation. Thus neonatal nurses should arrange neonate's position similarly to fetal position in intrauterine by positioning preterm neonates in the supine with flexion position when the preterm neonate is on mechanical ventilation. And turn position to lateral position when preterm neonates are clinically stable.

Hence as clinical nurses we need to follow cost containment methods in improving the quality of nursing care with cost effective care which is based on evidence based nursing.

Nursing Education

Integration of theory and practice is a vital need and it is important in nursing education. Care of preterm has been included in beginning years of Nursing Education. Hence Nurse Educators can lay emphasis on importance of position and its role in health maintenance of preterm neonates. With changing health care trends, nursing education must emphasize primary health care approach focusing on prevention than cure.

Nurse educators need to lay emphasis on positions in the curriculum and the nursing students should be taught about the importance of positions on ventilation and development. Advanced educational technology such as simulation, video assisted teaching could be incorporated for students while teaching positioning during mechanical ventilation also.

Nursing Administration

Technological advances and ever growing challenges place a great demand on health care professionals. Nurse Administrators have great responsibilities to provide nurses with substantive continuing education to tackle these challenges and demands. Continuing Nursing Education programmes enable nurses to update their knowledge and to acquire skill and demonstrate high quality care. This will enable the nurses to update their knowledge and to acquire special skills in practicing care.

Nursing Research

There is a need for extensive and intensive research in this area. It upon a big avenue for research on innovative methods of creating awareness, development of teaching material and setting up of multi media centers for teaching and for creating awareness among the nurses regarding position and its benefits, health promoting properties and its availability. Disseminate the findings through conferences, seminars, publications in professional, national, international journals and World Wide Web.

Recommendations

- The same study can be conducted on a larger sample to generalize the results.
- A similar study can be conducted by using true experimental design.
- The study can be conducted in different settings with similar facilities.
- A similar study can be conducted by using cross over design.
- A study can be conducted to investigate the effect of positioning on growth and weight gain of the preterm neonates.
- A similar study can be conducted for the preterm on mechanical ventilation.

REFERENCES

Als,H. (1982). Toward a synactive theory of development promise for assessment and support of neonate individuality**. Neonate Mental Health,** 3 (4).239-242

Annie Greenough, (2007).Effect of prone position in improving lung volume and oxygen saturation in preterm neonates. The Cochrane Library issues. 12(7),67-73

Arslan ,F., and Unal A.S. (2006). Effects of positioning after mechanical ventilation on oxygenation and behavioural distress of preterm neonates.Balkan Millitary Medical review,Turkey

Arvind Saili.(1997). **Challenges in Neonatology**. (1st ed.). New Delh : Jaypee Brothers Medical Publishers.

Alternes Liticia, C.O. (2003). Effect of preterm neonate position in weaning from mechanical ventilation. **Journal of Paediatrics,** 79(3), 239-244.

Bredemeyer, S.L.(2004). Body positions for spontaneously breathing preterm neonates. **Journal of Neonatology**. 17 (2), 85-89.

Brown., Adera., and Maslo. (2008). Previous Abortions and the risk of preterm and preterm birth. **Journal of Epidemiological and Community health,** 62 (1),10-12.

Burns, N., and Grove, S.K. (1990). The practice of Nursing research. Philadelphia: WB Saunders Company.

Chang,Y.(2003). Effect of prone position on activity on oxygen saturation in ventilated preterm neonates. **The Journal of acute and critical care,** 31(5), 34-42.

Curley, M.A.Q., and Thomson, J.E. (2001). **Critical care nursing ofneonates and children.** (2nd ed.). Philadelphia: W.B.Saunders company.

Dorothy .R.Marlow., and Barbara. (1988). **Text book of Pediatric Nursing** (6th ed.). Philadelphia: W.B.Sounders Company.

Dowling,D., and Lin,C.H. (2002). Decreased activity and desaturation in prone ventilators preterm neonates during the first postnatal week. **Heart and lung,** 31 (1), 34-42.

Fitzgerald, (2005). compare the effect of supine and prone position on preterm with acute respiratory distress. **Journal of Paediatrics,** 30(6), 76-79.

Jennifer Levy, (2006). Prone Versus Supine positioning the well preterm neonates. **Paediatric pulmonology**. 41 (18).Retrieved February01, 2008, from http://www .interscience. wiki.com/journal/112653541/

Jirapet, V., and Khamsriboss P. (1991). Comparison of the effect of postures on oxygen saturation in respiratory rate in post extubated neonates. **Thai Journal of Nursing,** 40(1),51-62

Keene, D.J., and Wimmer J.E.,(2000). Does Supine positioning increase apnea, bradycardia and desaturation in preterm neonates? **Perinatology Journal.** 1,17-20

Kurlac, A., and Ruggins. (2000). Effect of Nursing position incidence, type and duration of clinically significant Apnea in preterm neonates.**Paediatrics,** 7(10), 85-92

Kugelman, A.,and Bilaker A. (2002). Sidestream end tidal Capnometry as related toneonates position and maturation.**Paediatrics,** 91, 869-873

Mahajan,B.K.(1991).Methods of Biostatistics.NewDelhi:Jaypeebrothers publishers.

Moshin,M., and Jallaludin.(2008). Influence of previous pregnancy outcomes and continued smoking on subsequent pregnancy outcomes. **Journal of New Southwales,**89,5.

Polit. Densise., and Bernadette Hungler,P.(2007).Nursing research-Principle and methods. Philadelphia:J.B.Lippincott company

Richard Albert,K. (2001). Prone position and lung compliance. **Journal of Critical care medicine,** 2(1), 21-28.

Singh Meharban. (2004). **Care of new born.** (1st ed.). New Delhi : Jaypee Brothers Medical Publishers.

Siza.,J.E, (2008). Journal of Mwanza research center.43,2.

Tom. (2008). Highly pretermd neonates. **Paediatrics**. 11 (2) 52-53.

Willawan Peicheansathian. (2009). Positioning of preterm neonates for optimal physiological development : a systematic review,Chaing Mai University,Thailand.

Whaley and Wong. (2006). **Nursing care of neonate and children.** (7th ed.). St Louis: Mosby Publications.

Websites:

www.google.com

www.wikipedia.org

www.health.jerkey.com

www.interscience.wiki.com

www.medscape.com