DEVELOPMENT OF A TOOL TO ASSESS POSTORPERATIVE PAIN IN CHILDREN AND ASSESS PARENTAL COPING TOWARDS POSTOPERATIVE PAIN IN CHILDREN

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2004

DECLARATION

I do hereby declare that the present work is original and it has not previously formed the basis for the award of any degree or diploma.

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CERTIFICATE

This is to certify that this is an authentic record of the research work carried out by Mrs. Assuma Beevi. T. M. from April, 2001 to March 2004 as a part-time student in partial fulfilment of the requirements for the Degree of DOCTOR OF PHILOSOPHY under Faculty of Health Sciences of the University of Calicut under my supervision and guidance. No part of this thesis has been presented before for any other degree. I also certify that she has passed the Ph. D. qualifying examination of the University of Calicut, held in December, 2002.

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ABSTRACT

The present study was aimed at developing an age appropriate post operative pain assessment tool (APAT) for children (0-5 years) and assessing parental coping towards post operative pain in children

Objectives of the Study

- Develop an age appropriate postoperative pain assessment tool for postoperative infants (0-1 year) and children (2-5 years)
- Measure the quantity of postoperative pain in infants and children using age appropriate postoperative pain assessment tool (APAT)
- Identify the most common physiological characteristics (respiratory, cardiovascular and neuromuscular characteristics) manifested by infants and children with postoperative pain
- Identify the most common behavioral characteristics manifested by infants and children with postoperative pain
- Find out the relation between selected demographic variables of infants and children with postoperative pain
- Identify the most common coping strategy used by the parents of infants and children with postoperative pain
- Find out the parental coping towards postoperative pain in their infants and children

- Determine the relationship between selected demographic variables in parents and their coping
- Find out the parental coping towards postoperative pain in their infants and children using coping questionnaire
- Find out the relationship between parental coping strategies adopted by parents and APAT score
- Determine the relationship between parental coping and post operative pain in infants and children
- Identify the relationship between various coping behaviors and postoperative pain
- Compare the pain characteristics of infants and children with postoperative pain
- Compare the coping behaviors of parents of infants and children with postoperative pain

The study was conducted in paediatric surgical wards of IMCH, Calicut. A sample of 300 infant and children (150 each) and their parents were studied as per set criteria.

A conceptual model was developed for the study by the investigator and named **Infant- Child Pain – Parent Coping Model.**

A non experimental descriptive approach was used for the study and descriptive correlational design was chosen. Observation, physical examination and self reporting were used as the technique for data collection. The investigator prepared the

observational tool to assess postoperative pain in infants and children, observe the level of sedation in infants and children, and the coping strategies of parents and the coping questionnaire with Likert type format to collect data. The validity and reliability of the tools were established. Data analysis was done using descriptive and inferential statistics. The significant findings of the study were the following

- The most common physiological characteristics seen in infants with postoperative pain includes changes in respiratory rate (81.3%) with an increase of more than 10 per minute. So also with children in postoperative pain (88%). 85.3% of children also showed a slight increase in respiratory secretion.
- The most common behavioral characteristics seen in infants and children includes change facial expression (86.2% with facial grimace) and rigidity and crying and moaning
- Certain demographic variables are related to pain infants were birth order, condition at birth, birth complications and type of nutrition. But for children these factors were not related
- The most common reactions used by infants and children were protest and it showed a significant association with APAT score(P=0.000& P= 0.049 respectively)
- There was significant relation between APAT score of infants and children and their parents coping score. (P= 0.000 and P=0.014 respectively)

- There existed a direct proportional relation between APAT score of infants and children and their parents coping.
- The most common coping strategy used by parents of infants and children in post operative pain were verbalizing and seeking support from others and spiritual support.
- The personality characteristics of parents of infants and children were reasonable (61.3% and 78% respectively)
- The major items expressed as highly stressful to cope by parents include- caring stress, pain induced emotional stress and financial stress.
- There were significant relation between selected demographic variables of parents and their coping like age at marriage, education, occupation, type of family and financial status, quality of married life and coping
- The tool developed on the basis of the study include ten items with respiratory rate, respiratory secretions, pulse rate, temperature, diaphoresis, tearing/ crying, rigidity, facial expression, sleep disturbances and touching / pulling or guarding the wound site.

CHAPTER I

INTRODUCTION

NEED AND SIGNIFICANCE OF THE STUDY

STATEMENT OF THE PROBLEM

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OPERATIONAL DEFINITIONS

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INTRODUCTION

Pain, a neurologic response to tissue injury, is an unpleasant sensory and emotional experience associated with actual or potential tissue injury/ damage. It exists when the sufferer says it does and everyone has his/ her perception of pain. Postoperative pain can result from the manipulation and retraction of organs and tissue damage from the surgical procedure including irritation of tissues from intubations and intravenous therapy and the position of the patient during surgery. Chapman and Bonica (1977) described that damaged tissue releases chemical substances such as serotonin, histamines, Bradykinin and potassium ions that stimulate the transmission of pain impulses along A- delta fibres. In the past, health care professionals believed that children feel less pain than adults, who had undergone same type of operation. In fact, most physicians did not prescribe adequate pain medications for their young /paediatric patients. The reason they ascribe for this was that the child possessed immature nervous system to perceive pain in the true sense. They also believed that parents exaggerated/ aggravated the pain of their children. In contrast to this, some developmentalists believe that pain as a specific emotional response, exists from birth. It is now known that myelination begins in utero and includes the sensory roots at birth (Volpe, J, 1981). Price and Dubner R (1977) proved that pain impulses are transmitted by unmyelinated as well as myelinated fibres. Recent researches have shown that past belief about children's perception of pain were incorrect. Neonates and infants do feel and remember pain

experience. By 6 months of age, children demonstrate anticipatory pain when taken to a location where they once experienced pain. Anand KJS and Hickey P (1989), observed specific behavioural responses/ changes in neonates after circumcision implying the presence of memory of pain. Postnatal environmental adaptations of neonates are also disrupted with circumcision (Dixon S, Synder J, Holve R, and Bromberger P, 1984; Marshall R, Stratton W, Moore J and Boxerman S, 1980).

Health care professionals now recognise that children, who can not verbalize, do not complain of pain because they are afraid that injection to relieve pain would hurt more than the pain they already have. Hence they modify their pain behaviour and verbally deny pain to avoid injections. Children's increased activity also should not be considered as a coping strategy. Children, who have experienced multiple hospitalisations, know that if they stay in their hospital bed, people will come there to poke, probe and stick them and take them to places where they will be hurt. So they leave their hospital beds so that these events will not take place. The quieter, restrained behaviour such as sleeping are also taken as indicators of the absence of pain. In fact, children may use both approaches in coping with pain. Hester (1979) has suggested that children may use increased verbalisations and behaviours to reduce stress and tension. Mc Caffery and Beebe (1989) reported that behaviour manifestations of pain might decrease because of parental expectations, children's own coping, cultural strategies, fatigue and distractibility. Nurses and parents do not always agree on the parent's role when the child is undergoing painful

procedures. Many parents are now asking to stay with their children when hurting procedures and treatments are carried out on their children. Stoddard (1989) has suggested that the most effective analgesic very often is the presence of a well-prepared parent who can increase the child's feeling of security. Because of all these, physical and psychological trauma produced by the painful experience need to be addressed and proper intervention planned to reduce such trauma. There is need to encourage parents to do things they have done in the past that effectively helped them cope with difficult situations. There is need to assess and support parent's coping styles during pain experience of their children.

Need for Study

Recognizing children's pain is crucial to implementing the appropriate nursing interventions to relieve it. Nursing staff do not appreciate the intensity of postoperative pain experienced by their paediatric patients. It seems that a standardized method of pain assessment could assist nurses in recognizing the intensity of pain in the paediatric patients.

Elander, Linberg and Qvarnstorm (1991) found that even though nurses and parents seemed to be able to recognise pain symptoms, analgesic administration was inconsistent with regard to type (narcotic/ non narcotic), dosage, relation of dosage to body weight and number of doses. In another study Elander and Hollstorm (1992) compared the number of doses of analgesics given after open-heart surgery to adults, children and infants. During the first 5 postoperative days, the mean number of analgesics doses administered per patient was 10 for infants, 15 for children and 26

for adults. Infants have been under treated for postoperative pain for a variety of reasons. Arbitrary interpretation of prn prescription has been a factor in some cases. Eland JM (1974) examined the use of analgesics on paediatric surgical floor. She examined the charts of 25 children between the ages of 4-8 years and found that only 12 children received some kind of analgesics. Thirteen children did not receive any kind of medication despite having undergone major surgery like ASD repair, traumatic amputation, spinal fusion & hemi- nephrectomy. When Anderson and Eland (1987) matched these patients, with adult patients, the latter were found to have received 372 narcotic doses and 299 non-narcotic doses of pain medication, during their hospital stay. Mather and Mackie(1989) surveyed the incidence of pain in 170 postoperative children (mean age of 8 years) as well as the prescription and administration of analgesics to these children. They found a high incidence of moderate to severe pain reported by children but only 16% of these children received some amount of medication. Beyer, J.E (1983) examined the administration of analgesics in 50 adults and 50 children undergoing open heart surgery and found that 70% of the postoperative analgesics were given to adults, while their paediatric counter parts received only 30% of the analgesics given. Physicians and nurses have certain misconceptions / incorrect assumptions about pain in children and this too can be attributed for the core of under treatment of pain even though pain treatment is the essence of compassionate medicine. The most widely held incorrect assumption is that of a specific amount of pain for a specific stimulus. This often lead doctors and nurses to disbelieve patients and attribute their complaints to moral failure. Major

myth regarding childhood pain suggests that children because of neurologic immaturity do not experience pain. This assumption is used repeatedly to justify unanaesthetized circumcision in neonates. Yet another belief is the difficulty of metabolising analgesics in children. As a result doctors and nurses are exquisitely sensitive to the respiratory depressant effect of narcotics. Furthermore people are scared to use narcotics due to the possible complication that liver immaturity in children can contribute to increased half life of narcotics allowing a less frequent dosing of analgesics.

There are other misconceptions regarding pain in children that they have no memory of pain and that they get easily addicted to narcotics. All these have been disproved by research (Anand K.J.S and Hickey, P, 1989). The major problem existing in pain management in children is the complexity of pain assessment in children. In adults, the administration of narcotics and other analgesics is possible in response to their complaints of discomfort. This will not operate in children. Infants and toddlers often can not tell us verbally that they are in discomfort. Pre-schoolers and school-aged children may not be aware of the pain relief and if aware they are scared of the shots that they have to receive for pain relief. So it makes a challenge for doctors and nurses to provide adequate pain relief as a part of compassionate medicine to this vulnerable population. At present, there is no universally accepted, easily administered technique for assessing pain in children. Though there exist certain scales as self-reporting scales, behavioural scales and physiologic scales, all have advantages and disadvantages in varying degrees. Various pain scales have been

developed to assess pain in children in western countries especially in the U S A. A child's responses to and understanding of pain depend on child's age and stages of development (Bradshaw.C and Zenah P.D 1986). Out of the available tools, some scales rely on nurse's observations of child's behaviour if the child is non-verbal, (CHEOPS). Some depend on descriptive words and yet others depend on poker chips and pictures. Nurses who care for children in pain agree that accurate assessment of perception of the pain is essential to development of an effective treatment plan. Culture, tradition, parental behaviour and attitude often guide children in self -control, coping and enlisting assistance of others during pain (Abu-Saad, 1984; McGrath P.J. and Craig K.D, 1989). Because of the lack of universally accepted assessment system children are medicated on Prorenate (P.R.N) basis. This may be again based on nurse's and parent's vigilance in identifying children's discomfort. Nurses and parents view pain, as everyone, through a matrix of attitudes and assumptions, which allow them to interpret behaviours as pain. Therefore objectifying pain assessment would eliminate at least some of that subjectivity. Moreover, inadequate assessment will lead to under treatment. Hence with the development of more easily performed assessment techniques, clinical care will be improved and with more reliable standardised approaches, research will have a major impediment removed.

Accuracy of pain assessment is increased by the use of a valid, reliable, developmentally and culturally appropriate pain assessment tool. (APAT) The use of already available pain assessment tool in Indian children is questionable as these scales are specifically made for Caucasian, African-American and Hispanic children.

Hence it is highly essential to develop an age appropriate, culturally acceptable tool to quantify postoperative pain in our children. Existence of such a tool will promote practitioners to utilise the same so that they will not underestimate or overestimate quantity of pain in children and under-medication or over medication are avoided too. Furthermore, psychological trauma created by traumatic experiences of postoperative pain can be stressful to parents too. Reduction of postoperative pain will promote better coping in parents effectively with the treatment plan of their children. Ruth et al (1997) suggested that identifying experiences perceived as most stressful by parents can help the nurse in anticipating parental needs and also identifying the most helpful behaviour will facilitate positive coping by parents. With all these facts the investigator proposes a study to develop an age appropriate post operative pain assessment tool (APAT) and to assess parental coping towards pain in children.

Statement of the Problem

A descriptive correlational study to develop an age appropriate postoperative pain assessment tool (APAT) for infants (0-1year) and children (2-5 years) and to assess parental coping towards postoperative pain in children.

Objectives of the Study

1. Develop an age appropriate postoperative pain assessment tool (APAT) for postoperative infants (0-1 year) and children (2-5 years).
2. Measure the quantity of postoperative pain in infants (0-1 year) and children (2-5years) using age appropriate post operative pain assessment tool (APAT).

3. Identify the most common physiological characteristics (respiratory, cardiovascular and neuromuscular characteristics) manifested by infants (0-1Year) and children (2-5 years) with post operative pain.
4. Identify the most common behavioural characteristics manifested by infants (0-1year) and children (2-5 years) with post operative pain.
5. Determine the relationship between selected preoperative and postoperative vital signs in post operative infants (0-1 year) and children (2-5 years) in pain.
6. Find out the relationship between various demographic variables of infants and children with their respective APAT score.
7. Identify the most common coping strategy used by the parents of infants and children with post operative pain.
8. Find out the personality characteristics of parents of infants (0-1 year) and children (2-5 years)
9. Find out the parental coping towards postoperative pain in infants (0-1 year) and children (2-5 years) using coping questionnaire.
10. Determine the relationship between selected demographic variables in parents and parental coping.
11. Find out the relationship between parental coping strategies adopted by parents of infants (0-1 year) and children (2-5 years) and APAT score of their babies
12. Determine the relationship between parental coping and APAT score of infants (0-1 year) and children (2-5 years)

13. Identify the relationship between various coping behaviours and APAT score.

14. Compare the pain behaviours of infants and children.

15. Compare the coping behaviours of parents of infants and children.

Operational Definitions

For the purpose of the present study the researcher has operationalised certain terms as given below.

Infant- a baby either male or female between the age of 0-1 year undergoing surgery.

Children- a child either male or female between the age of 2-5 years undergoing surgery.

Pain – is a subjective, unpleasant sensory and emotional experience connected with actual or potential tissue damage or described in terms of such damage and the degree of it is as perceived by the sufferer. It has two components- A neuro-physiologically determined sensory component and an emotionally based affective state, depending on past experience, development and variety of other factors.

Selected demographic variables of infants and children- includes their age sex, immunization, number of sibs, order of birth, parameters on general assessment, birth history and post operative assessment.

Physiological characteristics- in this study, these are those neuro-physiological sensory basis for sensation of pain related to tissue damage/ injury as

manifested by change in vital functions such as respiratory, cardiovascular and neuromuscular functions.

Behavioural characteristics- are those responses that a child may manifest during pain such as crying, grimacing, sleep disturbances, not consolable or pulling the operation site.

Pain behaviours- are physiological and behavioural characteristics of infants and children in pain during post-operative period.

Infant characteristics-/ (child characteristics) are those behavioural and emotional responses that a child may manifest during pain such as irritability, anger and thrashing.

Parental characteristics-are those behavioural patterns that the parents exhibit during child's sick role and pain. This may be manifested as personality characteristics and coping strategies. (Loss of hope, disappointment and frustration related to failure of treatment, interventions, and long term effects of continued disruption to one's own daily life and activities.)

Coping strategies- are a set of behaviour coined by the researcher with help of previous literature for observing the behaviour of parents of infants and children with post operative pain.

Coping behaviours- are those behaviours and feelings expressed by the parents of infants and children with post operative pain elicited with help of a questionnaire guided interview.

Parental coping- the way a parent comes into terms with postoperative pain of their children and adapts to it. It is monitored by measuring the cognitive, affective and behavioural responses of the parent using an observational checklist and a questionnaire. The questionnaire has four sections with subsets in each section.

Assessment – according to Mc Grath and Unruh (1987) assessment connotes a broader concept than pain measurement. In assessment a variety of factors should be considered, such as the nature of the noxious stimuli, physiological, behavioural and emotional responses, the patient's self report, environmental and situational factors parental opinions of the child's current experience and reactivity to previous painful stimuli.

Age appropriate pain assessment tool- the observational tool used for monitoring physiological, behavioural and miscellaneous characteristics of a child in post operative pain developed by the investigator after for the purpose of the study.

Assumptions

1. All children after surgery experience some amount of pain.
2. Quantification of pain helps in providing adequate pain relief.
3. Pain assessment tool helps to evaluate pain management.
4. Amount of pain in children affect parent's coping.

Conceptual Framework

A framework of reference can be derived from an existing theory (theoretical frame work) or derived from by the researcher through identifying and defining the concepts of interest and proposing relationship among them (conceptual frame work). The purpose of the framework is to organise the development of study and provide a context for interpretation of the findings. The findings are abstractly generalised as they are used to clarify the meaning of concepts and explain relationship among concepts with the study frame of reference. This adds theoretical information to the body of knowledge and without a framework the findings are limited to a concrete situation. But facts must be organised, explained and given meaning through a framework. A conceptual framework is used for this study, as there is no existing theory available or sufficient to propose a theoretical framework. The development of the conceptual framework has two steps. In the first step, the identified concepts are examined within the study and meaning is provided with conceptual definition by conceptual analysis and extraction from some theories. In the second step, the relationships are stated between the concepts and the relationships are clarified by illustrating them in a model.

The concepts defined are pain, the demographic variables of infants and children, physiological characteristics (respiratory, cardiovascular, neuro-muscular characteristics) behavioural and miscellaneous characteristics along with infants and children. Demographic variables of parents, parental coping strategies and parental

coping behaviours are also defined. Then relations between these concepts are depicted in a model named **Infant- Child Pain Parent coping model.**

Pain is an unpleasant sensory and emotional experience connected with the actual or potential tissue damage (IASP Subcommittee on Taxonomy on Pain). Surgery being an iatrogenic injury (actual) also produces certain amount of tissue damage that promotes the secretion of K^+, serotonin, bradykinen and histamines thus resulting in the sensation of pain. According to Stevens pain produces physiological changes indicative of autonomic arousal (Meinhart NT, Mc Caffery M, 1983). These changes in physiological variables can be changes in respiratory characteristics, cardiovascular characteristics and neuro- muscular characteristics. These can be monitored and quantified to assess the degree of pain.

Certain behavioural characteristics are manifested in response to pain and these behavioural changes too contribute to the quantification of pain along with physiological variables. Various researchers in assessing pain in children used these behavioural characteristics. Loeser (1980) stated that the subjective state of suffering can be identified through the observation of pain behaviours which has a cognitive, developmental and emotional element. Behavioural cues are used in assessing pain in different scales like CHEOPS, CHIPPS, and TIPPS etc.

Miscellaneous characteristics are cues that can be accompanied with pain to accommodate children's past experience, child- parent relationship, culture and assignment of meaning to experiences. So, measuring physiological, behavioural and miscellaneous characteristics of infants and children with post operative pain provide

a culturally accepted age appropriate framework for assessing degree of pain. Behaviour is the manner in which a person acts or performs any or all the activities of person including physical actions, which are observed directly, and mental activity, which is inferred and interpreted. These activities are related to inter relationship of the individual with the culture, society and environment. So there exist a relationship between behaviour and the parental characteristics and infant/ child characteristics. Parental characteristics are behavioural patterns that the parents exhibit during their child's sick role and pain. These depends on many co-existing factors as loss of hope, disappointment and frustration related to failure and treatment, intervention, long term effect of continued disruption to one's daily life and activities.

APAT is prepared in the assumption that this scale will provide culturally accepted age appropriate tool for assessing pain in children as it measures physiological, behavioural, miscellaneous characteristics of the infant and child with post operative pain.

Parents as persons are composed of 3 components as biological component, psychological component and social component. **Component** is a part helping to make a whole. These 3 components together make an integrated whole of a person as parent. Each of these components consists of subcomponents. Biological component have many links as links of heredity, links of reproduction, link of maturation and link of disintegration.

Psychological component have many links as quality of marriage, spouse link, and maternal- paternal love/ affection link. Social component have links as family milieu, environmental milieu, educational milieu and economic milieu. Coping of parents to any crisis is related to the compactness of these components and together monitored as demographic variables in the present study. It is believed that compactness of these components in the positive direction promotes positive coping.

Parental coping is a process, by which person deals with stress, solves problems and makes decisions. Cognitive and non-cognitive coping may be presented. The amount of situational crisis decides the ability for positive coping. Lazarus (1966) viewed coping as a process in the transaction of the individual and a stressor. Coping included the cognitive and behavioural efforts to manage demands with resources of the individual. Folkman and Lazarus, (1988) suggested how parents cognitively appraise concerns related to the care of their child and how that will determine their coping strategies. The cognitive component includes thought and learning necessary to identify the source of stress. The non-cognitive components are automatic and focus on relieving discomfort. The degrees of pain, infant/ child characteristics, the 3 components stated above are situations in the post -operative period that may decide the coping ability of parents.

Infant/ child characteristics are those behaviours and emotional responses that a child may manifest during pain are monitored along with behavioural characteristics.

The Infant/ Child Pain – Parent coping Model depicts the physiological, behavioural and miscellaneous characteristics of pain experience of post operative infants and children. It also adds the influence of pain and its relationship with parental characteristics, child's characteristics and parental coping.

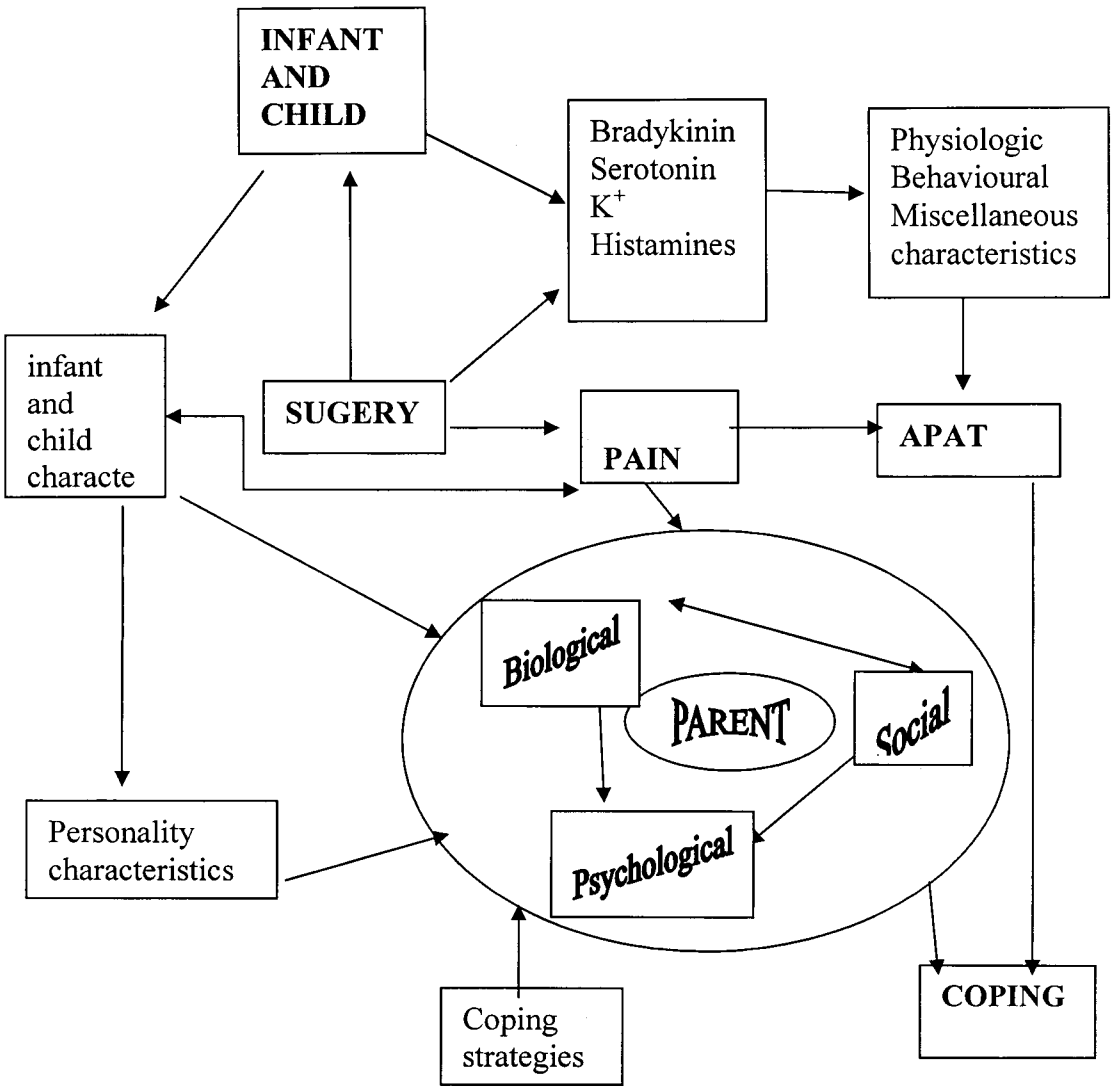

Figure 1- Infant- Child Pain – Parent Coping Model

Hypotheses

1. There is no significant alteration in preoperative and postoperative vital signs (respiratory rate, heart rate, blood pressure and temperature) of infants (0-1 year)
2. There is no relationship between infant characteristics and their postoperative pain score (APAT score)
3. There is no relationship between parental characteristics and parental coping towards postoperative pain in their infants
4. There is no significant relation between the pain score (APAT score) and parental coping of postoperative infants
5. There is no significant alteration in preoperative and postoperative vital signs (respiratory rate, heart rate, blood pressure and temperature)of children
6. There is no relationship between child characteristics and their postoperative pain score (APAT)
7. There is no relationship between parental characteristics and parental coping towards postoperative pain in children
8. There is no significant relationship between the pain score (APAT) and parental coping towards postoperative pain in children

Delimitations

The study is delimited to

- Infants (0-1 year) and children (2-5 years) who had undergone surgery of the gastrointestinal, cardiovascular, respiratory and genitourinary system and their parents.
- Parents who are willing to participate.

CHAPTER II

REVIEW OF LITERATURE

REVIEW OF LITERATURE

The section of review of literature looks into various related areas of pain from theoretical postulates to various aspects of pain measurements along with parental coping. The literatures related to present study are divided into the following headings.

1. Theoretical understandings about pain
2. Evidence of pain in neonates and infants and children
3. Pain in neonates and infants and children
4. Assessment of pain in neonates and infants and children
5. Pain assessment scales
6. Patient characteristics
7. Developmental issue and
8. Postoperative pain in children and parental coping

Theoretical Understanding about Pain in Infants

Pain a subjective experience, its existence need to be inferred by others. . Being a subjective phenomena pain cannot be measured with a single aspect. Pain is multidimensional so several aspects related to pain need to be considered while studying about pain. Infants can not use language to say that they are in pain. The word infant is derived from a Latin word "infans" which means incapable of speech. So in quantifying pain in infants we need to use other measures. There are certain theoretical postulates about pain in literature.

Gate Control Theory

Basically, the theory states that the numeral mechanisms in the dorsal horns of the spinal cord act like a gate that can enhance or diminish the flow of nerve impulses from peripheral fibers to the spinal cord cells that project to the brain. Somatic input is subjected to modulating influence of the gate before it evokes pain perception and response. The theory talks about 2 types of fiber inputs namely large fiber input and small fiber inputs. The large fiber inputs tend to close the gate and small fiber inputs opens the gate. The gate is also influenced by descending controls from the brain. The sensory input is also modulated at successive synapses throughout its projections from the spinal cord to the brain areas responsible for pain experiences and response. Pain occurs when the number of nerve impulses that arrive at these areas exceeds a critical level.

Melzak and Wall (1965&1983) considered Gate control theory based on the accumulation of physiological evidence and partly on assumption of physiological and clinical observations. Melzack (1983) describes the three components of pain as intensity, sensory and affective. He acknowledges that the intensity is the salient dimension of describing pain. But describing only the intensity of pain is like specifying the visual world only in terms of light flux without regard to pattern, color, texture or the many other dimension of visual experience. Melzack further says that while evaluating pain the affective quality has to be considered that differentiates pain from sensory experience such as sight, hearing and touch. Gate control theory has its attention specifically on sensory (neurophysical) perceptual (psychological) and

evaluative components of individual's pain experiences. But it incorporates the development of specific responses in the infant and these responses would influence infant's pain experiences.

Stress Arousal Model

Some develop mentalists believe that pain as a specific emotional response exists from birth (Izard, (1982; Waz-Hockert, Lind, Vuorenkoski, Partanen and Valanne, 1968) but others like Porter, Porges and Marshall(1988) find the model of a stress arousal continuum more appropriate for studying pain in infants. According to stress arousal model (Lester, 1984) stress is associated with arousal in infants. Arousal is reflected in varying states on a continuum from quiet sleep to wakefulness and finally crying. Degree of arousal depends on degree of stress. Clinically this conceptualization is reflected in increased sympathetic activity for example, increased heart rate and behaviorally increased movements, facial action and crying. Cry can be differentiated by caretaker from other reasons. For example neonates with traumatic birth cries in a different way with a high pitched, harsh, tense and jittery cry giving clue for stress and perceived urgent by care givers. This is related to increased innervations of the vocal tract (Goulb and Corwin, 1985; Fuller, 1991; Johnston, 1986 and Porter et al, 1986).

Emotional Specificity Model

According this model pain is a specific emotional response that exists from birth and that there is a particular constellation of facial and cry patterns for pain that is unique and discrete from other emotional states, it also proposes that the intensity

of pain is proportional to the extent of tissue damage. This model proposes that there is survival value in the uniqueness of the cry and facial behaviors. The theory implies a fixed, straight through transmission system from pain receptors in the skin to a pain center in the brain That means a helpless infant in pain will cry in a particular manner or show a particular face that will signal the caretaker that he is in pain and need assistance. Izard et al (1980) identified expression of emotions including pain. Darwin in 1800 described

Three salient features of facial expression have been identified as closing of eyes, wrinkling of skin around eyes and contacting the forehead. 2 centuries later Granavu and Craig and Izard et al also studied the characteristics of pain expression s to include eye squeeze, brow contraction and nasolabial furrow.

Parallel Sensory – Emotional Process Model

According to Leventhal and Everheart (1979), emotions contribute to the subjective experience of pain. Dale (1989) identified that when an infant is subjected to an acute pain stimulus, it will lead to observable behavioural outcomes such as crying, facial grimacing, body thrashing and autonomic responses. This model would ultimately provide for making assessments of the infants pain state based on more than one behavioral dimensions (Johnston and Strada,1986: Owens,(1984).

Although these theories are put forward by different theorists, no studies have systematically evaluated the influence of cognitive development on the understanding of pain children less than 5 years is due to difficulty in self report. Observation of infants facial expression during immunization injections indicate that by 6 months

they anticipate the event with fear and respond with pain and display some anger. By 20 months, anger has become a far more dominant component of the relation pattern. Gaffery (1987) examined 680 Irish children between 5 and fourteen years of age to identify the relationships between the cognitive development and pain. She detailed changes in children's description of pain. Barr (1988) noted that clinicians usually depend on informant's viewpoint on pain of children rather than understanding of children about pain.

Nociception rather than Pain

Anand and Hickey (1987) after a through review of researches suggested that nociception may be a more correct word than pain when referring to neonates. Mc Grath (1990) described nociception as the detection of a painful stimulus in the peripheral nerve endings and the transmission of information of the site of painful stimulation to the brain. It does not involve the affective / evaluative component of pain. It involves both nervous system and endocrine system. The nervous system, the pain signals are generated and processed and the endocrine system controls the chemical response to pain signals. Foetal nervous system is sufficiently mature by twenty weeks of gestation (Anand and Hickey, 1987). Fitzgerald, Shaw and Macintosh, (1988) supported the notion of enhanced nociception in the neonate. Fitzgerald et al demonstrated a decreased cutaneous flexor reflex threshold in premature infants less than 30 weeks of gestational age. Clinically, this finding supports the idea that premature infants may, in fact experience increased nociception given the same stimulus as older infants. Dunn (1977) reported, infants have

developed the capability of intentional crying well before one year of age, and Levy (1960) reports anticipatory fear of painful stimuli at six months of age. By 9-10 weeks of gestation, neurotransmitters are developed. By 20 weeks the cerebral cortex is fully developed to sense the experience of pain.

Evidence of Pain in Neonates and Infants and Children

There was a misbelief that children including neonates do not experience or respond to pain. Some authors have suggested that children especially neonates and infants do not respond to painful experience as adults do, there is no evidence that this is true (Gross and Gardner, 1980; Mather and Mackie, 1983; Owens 1984). Yaster and Deshpande, (1988) described that when exposed to pain neonates infants, children and are subjected to stress responses similar to that of adults. Infants have demonstrated behavioral changes such as crying for up to 72 hours after procedures such as circumcision that supporting Yaster and Deshpande (Richards, Benard and Brackbill, 1976).

The prevent myth that infants do not feel or respond to pain is based on the incorrect notion of under developed nervous system. Volpe (1981) identified that myelination begins in utero and includes the sensory roots at birth. Gleiss and Stuttegen, (19896) have further demonstrated that infants have peripheral nerve endings capable of nociception and the density of these nerve endings increases between 26-32 weeks of gestation. Fitzgerald et al (1988) had shown that although infants respond to painful stimuli at a slower rate than adults do, about one fifth of the adult's rate, but they certainly do respond. Melzack and Wall (1965) and Melzack

(1983) proved even if lack of myelination exists, from the gate control theory, pain impulses are carried by 'C' fibers which are not myelinated. Hence lack of myelination does not imply lack of function in the peripheral nerves, although conduction speed of nerves is slower. But this is overcome by smaller length of peripheral nerves to central unit (brain).

Now it is known that neurotransmitters appear as early as 8-10 weeks of gestation (Chrnay, 1989) and by 20 weeks the cerebral cortex is completely developed, making cutaneous sensory perception possible. Nerve tract continues to develop between 22-30 weeks of gestation. Fitzgerald and Kotzenburg (1986) suggest that descending pain pathways may not be functionally developed until some time after birth. Hence modulating effect is absent contributing for more pain experience. Premature neonates may therefore be particularly sensitive to aversive procedures because of the immaturity of descending inhibitory pain control mechanisms.

Rich, Marshall and Volpe (1974) studies infants and found movements of extremities occur with pain of pin pricks and heel lances as compared to preschool children (Hester,1976).

Pain in Neonates and Infants and Children

Pain being a complex phenomenon, presents special problem in assessment and management of it in the infants, who are incapable of speech. But in contrast to early belief, that infants are incapable for feeling pain, health professionals do believe anything that is painful to adults can be painful to neonates and infants too. Mc Grath

(1941) supported the notion that neonates were incapable of feeling pain because of their responses were thought to decorticate. Levy (1960) and Mersky (1970) suggested that infants were incapable of remembering a painful event and therefore unable to express their pain in a meaningful way. Gillier et al (1983) and Rizvi et al (1987) demonstrated that neurological development of pain pathways along with cortical and sub cortical centers necessary for pain perception are well developed late in gestation. Hence neonates are quite capable of experiencing pain. Evidences suggested that neonates are neurologically developed enough to perceive pain and that they respond in significant physiologic ways to pain. Anand and Hickey (1987) proved that short term effects of pain are reflected in physiologic variables and Shapiro (1989) found behavioral variables as vocalization, facial expression and body movements in response to painful stimuli. But behavioral manifestations do not necessarily correlate with pain intensity. Dobing, 1975; Zenah, 1984; Abs et al, 1986 identified the long term effects of pain and distress as changes in biologic and physiologic development. Studies of Mc Croy, (1999) support the notion that infants can have memories of painful experiences, the consequences of which are potentially harmful and negative when these memories can persist over time.

Barbara et al, (1991) found the physiologic and behavioral responses of newborns exposed to painful experiences were different further than those of control not exposed to such experiences and concluded that the newborns were able to categorize reality and to process social and physical information.

Pain in Children

Pain being a human experience, brings with it the child's physical condition, developmental level, gender, psychological condition, personal concerns, background meanings, family issues, culture, emotions, reflective thoughts and environment (Benner, Wrubel, 1989; Hester, Foster, Kristensen and Bergstorm, 1989; Watson, 1985). Gaffney and Dunne (1986) in their study of children through 5-14 years of age, young children understood what pain meant and described pain more concretely than did older children. Similarly Ross and Ross (1988) found that children five through twelve years of age understood the word pain. But other researchers (Eland, 1974; Eland and Anderson, 1977; Hester et al, 1978; and Hester and Barcus, 1986) concluded that children under 6 years of age rarely understood the word pain tended to use the words hurt and owie. Children who do not understand the word pain may deny their pain if asked. To avoid this problem, researchers and clinicians must clarify with family the words the child uses to communicate about pain. Hester, (1986) suggested that some hospitalized children as old as 12 years do not understand the word pain. In addition to age or developmental level and hospitalization family issues may also influence a child's experience of pain. Clinical traditions often guide children about self control, coping and enlisting the assistance of others.

Assessment Pain in Neonates and Infants

Pain management consists of accurate pain assessment and adequate pain control. Effective management of pain decreases suffering and may improve recovery from illness and shorten hospitalization (eland, 1990). However assessing and

measuring pain is complex because of its multidimensional nature. Acute pain management Guideline Panel (1992) emphasized the recognition of pain, its assessment and reassessment as a crucial step in the treatment of children with pain. Assessment of pain in infants pause a greater effort from nurses as infants are incapable of vocalizing pain intensity as that of adults. Several groups of researchers found that children received few pain medication even after same type of surgery as that of adults (Swafford and Allen,1968; Eland and Anderson ,1977; Beyer, DeGood, Ashely and Russel,1983; Mather and Mackie, 1983; Burokas, 1985). The methods used for measuring pain fall generally into three categories as behavioral, physiological and self reports. Behavioural and physiological methods have been used with preverbal and verbal children (Piaget and INhelder, 1969).

Behavioural Methods

Primary behavior assessed to indicate pain include vocal (crying and whining) in neonates and infants, facial expression (grimacing) and large motor movements (flailing of arms and legs. Rich, Marshall and Volpe ,1974; Hester, 1986, studied infants and found movements of extremities occur with pain of pin pricks and heel lances as compared to preschool children (Hester,1976). Crying being one of the most common types of vocal behavior, has received significant amount of attention. Crying associated with other conditions such as hunger, fear and anger can be distinguished from cry of pain from pitch, jitter and shimmer. Fuller, Horri and Connor (1989) concluded that a distinguishable pain cry exists with certain attributes like pitch and tenseness. Facial expression is also commonly assessed in studies on pain in

preverbal children (Frank, L.S, 1969; Mills, N. 1989). Grunau and Craig (1990) studied neonates who undergone heel lances, found a characteristic pain expression that include eye squeeze, brow contraction and nasolabial furrow. Johnston and Strada, (1986) described that the facial expression of infants receiving immunization was the most stable indicator of pain and showed least variability when compared to cry, heart rate and body movement.

There have been tools developed to measure either a single behavior or multiple behaviors. Cry, facial expression and motor behaviors have been measured independently from either behavior. Examples of such tools are Facial Action Coding Scale (Ejman and Friesen, 1978) and Maximally Discriminating Facial Movement Coding System (Izard et al, 1980). Most tools that measure behavior are multidimensional. Examples for such scales are The Infant Pain Behavior Rating Scale and Children Hospital Eastern Ontario Pain Scale (CHEOPS). A number of studies have been conducted to evaluate specific behavioral responses by infants and toddlers to painful stimuli (i.e. Cry, facial expression and body movements). The following table explains few of the behavior studied and the authors.

Table 1

Pain Behaviors

Category	Description	Authors
Cry/vocalization	Latency to cry, duration of cry cycle, frequency, melody and dysphonia	Owens & Todt. 1984; Porter, Miller & Marshal, 1986; Fuller, Horii, Grunau & Conner, 1989; Stevens, Johnston & Craig, 1990; Johnston & Grunau, 1995.
Facial expression	Brow activity, nasal root, eyes, mouth, chin and tongue	Izard, 1982; Izard, Hembree & Huebner 1987; Grunau & Craig, 1987; Fuller & Conner, 1995.
Body movement	Limb movements, thrashing, jerking, withdrawing, kicking and torso rigidity.	Craig, Mc Mohan, Morison & Zaskow, 1984; Dole, 1986; Johnston & Strada, 1986.

Assessment of Pain in Children

Beyer and Wells (1989) suggested that management of children's pain have raised many critical questions about the appropriate assessment of acute pain in clinical settings. Ideally assessment and management are interdependent. Schecter (1989) pointed out that paediatric pain is apparently under-treated. This is due to the problem inherent in measuring and quantifying paediatric pain. The measurement and

assessment of paediatric pain are some of the challenging problems faced by health care providers (Price, Mc Grath, Rafi, Buckingham, 1983). If pain management strategies are carried out without through systematic assessment, these strategies probably will not be effective or appropriate. The goal of pain assessment should be to provide accurate data to determine which actions should be taken to alleviate or abolish the pain and on ongoing basis to evaluate the effectiveness of these actions.

In certain literature the term measurement and assessment are used inter changeably. Measurement is the term most often used in a research context while assessment is the preferred term in a clinical context. According to Mc Grath and Unruh (1987), assessment connotes a broader concept than pain measurement. In assessment a variety of factors should be considered, such as the nature of the noxious stimuli, physiological, behavioral and emotional responses, the patient's self report, environmental and situational factors and parental opinions of the child's current experience and reactivity to previous painful stimuli. Measurement of pain on the other hand refers to the quantification of various aspects of the experience.

Pain Assessment Scales or Tools in Neonates, Infants and Children

Since the investigator's first objective of the study was to develop an age appropriate pain assessment tool for postoperative children the researcher has done a detailed review of the present available tools. This review helped the investigator to identify the most common items used in different tools among physiological and behavioral signs and symptoms of pain in postoperative children and inculcate the

same in the developed tool for this study. The following are few studies the investigator studied thoroughly among the physiological and behavioral scales.

Various pain scales have been developed to assess pain in children. The methods generally fall into one of the three categories as behavioral, physiological and self reports. These scales are used individually or in combination with one another. Behavioral and physiological methods have been used in both preverbal (infants and toddlers) and verbal children. Some of behavioural responses and descriptions of pain that are used in pain assessment tools are depicted in table2.

Table 2

Behavioral Responses and Verbal Descriptions of Pain by Children of Different Age Groups

Age	Behavioral responses	Verbal responses
Infant<6 months	Generalized body movements, chin queering, facial grimacing, poor feeding.	Cries
6-12 months	Reflex withdrawal to stimuli, disturbed sleep and irritability	Cries
Toddlers 1-3 years	Localized withdrawal, resistance of entire body, aggressive behavior and disturbed sleep	Cries and screams, can not describe intensity or type of pain
Preschoolers 3-6 years (preoperational)	Active physical resistance, directed aggressive behavior, strikes out physically and verbally when hurt, low frustration level.	Can identify location of pain, may believe his or her pain is obvious to others

Adapted from Sandra et al, Paediatric Nursing- May –June 1997, 23:3.

Howard and Thurber (1998) did a descriptive study to identify the indicators used by neonatal intensive care unit (NICU) nurses to interpret pain in infants. Samples of 72 nurses from NICU were selected and structured interview schedule was used as the tool. The 10 pain indicators used by more than 50%of nurses were: fussiness, restlessness, grimacing, crying, wiggling, rapid state changes, wrinkling of forehead, and clenching of fist. These findings were consistent with stress cues identified in Als' Synactive Theory of Development and lend support to the use of such measures for the assessment of infant pain. Olson and Downey (1998) identified the neonate's response to noxious stimuli by studying 20 infants born at a US Hospital. Measurements of blood pressure, heart rate and oxygen saturation obtained along with a Neonatal Infant Pain Scale (NIPS) grading at five separate intervals throughout circumcision procedure. A comparison was done between two groups and the findings showed that infants demonstrate physiological and behavioral responses to pain and these responses are observable and measurable. Health care providers are somewhat reticent to accept the use of behavioral characteristics as adequate in the management of painful responses in very young children and considered measuring physiological variables as more objective. Meinhart and Mc Caffery attributed changes in physiological parameters to autonomic arousal.

Self reports scales often require verbal and cognitive ability at preoperational level hence secured for preschool to adolescence. Some pain assessment scales rely on the nurse's observation of the child's behavior if the child is nonverbal. The

Children's Hospital of Eastern Ontario Pain Scale (CHEOPS), the Objective Pain Scale (OPS), Preverbal Early Verbal Paediatric pain Scale (PEPPS), the Children and infants Post operative Pain Scale (CHIPPS) and Postoperative Pain Scales (IPPS) are examples of behavioral assessment tools developed to quantify pain in nonverbal postoperative children (Beyer, Mc Grath & Berde, 1990) and these tools are given in table 3

Table 3

Categories of Behavior in Pain Assessment Tools

FLACC 1997	CHEOPS 1985	OPS	TPPPS (1992)	BUTTNER/FINKE (1998)
Face	Facial expression		Facial pain expression	Facial expression
Legs	Leg movement	Movement		Leg position
Activity	Torso movement	Agitation	Bodily pain expression	Position of torso Motoric restlessness
Cry	Cry	Cry	Vocal expression	Cry
Consolability	Touching of wound	Blood pressure		Consolability
	Verbal report of pain	Verbal complaint and body language		

Adapted from Sandra et al, Paediatric Nursing- May –June 1997, 23:3.

Buttner et al described CHIPPS and IPPS with behavioral observations. CHIPPS contained items such as crying, facial expression, positioning of legs, positioning of trunk and motoric responses whereas IPPS contained the items crying, facial expression, positioning of the arms, positioning of the trunk and motoric restlessness. They did factor analysis of these items and the two systems had a high internal consistency with alpha >0.9 ($p<0.1$) with at least 73%explained variance. Tesler, Holzemer and Savedra, (1998), studied pain behaviors in 37 multi ethnic children using Word Rating Scale for self report of pain intensity and the Paediatric Pain Behaviors. Five most frequently observed behaviors were calm, maintaining one position, flexing limbs, eyes shut and knees drawn up. All children in their study reported pain on the first two postoperative days.

Assessment of Pain in Verbal Children

Most scales depend on the child's report of pain intensity in verbal children. These assessment tools can not determine whether children feel the same amount of pain as adults who undergo same type of surgery. The common scales / tools used by different researchers are POCKER CHIPS(Hester , 1989),FACES PAN SCALE (Wong & Baker, 1985)for preschool children and NUMERIC PAIN SCALE for children from 9 years to adults. Other scales are Objective Pain Scale for children for >7 years, which can be used for the assessment of behavior in post operative children and do not require patient participation. CHEOPS (1-7 years) also utilizes behavioral manifestations such as facial expression, crying, torso position leg position, touching

painful site etc. Eland colour tool (3-7 years), which need six crayons, black, purple blue, red, green and orange. The child selects the color according to severity assigned. Oucher Scale (3-7 years) child selects the face that best fits his or her level of pain or the child can select a number between 0-100. Yet other scale used by nurses and pain experts are VISUAL ANALOG SCALE (Walco and Ilowik, 1999) and DESCRIPTIVE SCALE. Visual analog scale places 10 cm horizontal line with end points marked O PAIN and WORST PAIN on piece of paper and asked the child to mark on the scale how much pain he or she has. Descriptive scale, at one end NO PAIN and the scale has different degrees of pain as no pain, mild pain, moderate pain, quite a lot, very bad and finally the worst pain.

Patient Characteristics

Specific studies related to patient characteristics were lacking in the literature. However some studies explored patient characteristics among adults. The following are some of those studies, which are found to be relevant to the present study.

Socioeconomic Status

Davitz and Davitz, (1981) found a significant difference ($p= 0.01$) in the socioeconomic status of patients and their ratings of pain. But Choiniere et al (1990) compared the accuracy of nurse's estimates of the pain of patients on burn unit found no difference on assessment of socioeconomic status of the patient. A more recent study by Calvillo and Flkered (1993) found that nurses tend to regard middle class patients experiencing more postoperative pain than less educated, socially unprivileged segment of the population.

Illness Severity

Davitz and Davitz (1981) used vignettes of patients and rating related to pain and psychological distress existed for certain condition like trauma. The most painful illnesses were rated as cardiovascular diseases and severe trauma.

Gender

Studies have found no significant relationships between pain and psychological distress scores and the patient's gender (Davitz and Davitz,1981; Oberst,1978; Davitz and Pendleton, 1969). Although no significant relationship appears to exist between inferences of pain and the patient's gender, Bond, (1981) found that nurses in a radiotherapy ward initiated more analgesics request from male patients. Cohen, (1981) found that nurses selected less medication for pain in female patients than for male patients.

Age

Davitz and Davitz, (1981) found that the age of he patient had influence on nurse's inference of physical pain. But it was a factor in relation to psychological distress. Nurses rated children of 4-12 years as less psychological distress for children as well as significant difference in relation to pain, children received the highest score. Taylor et al, (1984) found that the patient's age did not affect inference of pain. Choiniere et al, (1990) compared the accuracy of nurse's estimates of the pain of patient's in burn units and found no relationship between the patient's age and nurses inferences and assessments. Tesler,(1998) found that girls tended to shut eyes, sleep,

remain immobile and report pain more than boys who were silent, kept their eyes open and grasped at pain sites.

Evidence of Pathology

Nurses attributed less pain to hypothetical patients than with physical pathology (Taylor et al, 1998; Halfens et al, 1990)

Under treatment of pain in children

Under treatment of pain is a common principle even though pain treatment is a cardinal principle of compassionate medicine. But researchers in this field opened the eyes of health professionals and situations improved in the case of adults. But children's pain continues to receive limited attention and in some places the condition is still deplorable. Available literature on this aspect is reviewed in this section. Sawford and Allen, (1974) reported that only 2 out of 60 children required pain medication after surgery on their ward and said that paediatric population tolerates discomfort well. They express their discomfort and may not relate this to pain. Eland, (1977) examined the use of analgesics on paediatric surgical floor. Out of 25 paediatric surgical patients between the ages of 5-8 years only 12 children received some kind of analgesics/ pain medication with major surgical interventions like amputation, hemi- nephrectomies and excision of neck mass and ASD repair. Where as Anderson, (1985) matched these children with adult patients found that adults received 372 narcotic doses and 299 non- narcotic doses of pain medication. Mather and Mackie, (1983 surveyed the incidence of pain in 170 postoperative children

(mean age of 8 years). Their prescription o f analgesics and doses, majority had PRN prescription and that too was not given properly.

Developmental Issues

Melzak and Wall, (1965) said that pain is always embedded in a complex matrix of biological, psychological and social interaction. To adequately understand pain in children, careful consideration must be given to both developmental and psychological processes.

Physiological Development

McGrath and Craig,(1989) had identified three issues concerning physiologic development as :

1. pain perception and response
2. response to medication and trauma
3. development of syndrome

Recent studies now clearly demonstrated that neonates do feel pain. There is array of animal and human studies to demonstrate that the anatomic, functional and neuro- chemical systems sufficiently well developed at birth to permit pain perception. Anand and Hickey, (1987) and Fitzgerald, (1993) found that younger infants may perceive pain more acutely because of immaturity of the descending control mechanisms that damp down the transmission of pain in older infants, children and adults. Haslam, (1969) in his study suggested that an increase of pain threshold with age. Infants and young children primarily respond with physical withdrawal from the stimulus, large body movements and crying. Older children and

adolescents are less likely to cry or protest. They are more likely to express their distress with winks or grimace (Craig et al, 1988). Leikin et al, (1988) in a study of 127 children between the ages of 9 and 14 years who were undergone tonsillectomy and adenoidectomy, younger children reported fewer symptoms and were perceived by their parents as having less pain than older children. This may be that older children can effectively cope or may be more cautious in the face of pain.

Memory of pain requires both the perception of pain and the cognitive capability for memory. The cited literature in this chapter gives ample evidence perception of pain in neonates. Moscoviitch, (1984) demonstrated enough evidence o f memory of other non painful stimuli at a very young age and neonates has the necessary physiological apparatus for memory. The neonates in ICU, who were subjected to repeated aversive procedures, breath hold or go off when approached by anyone, suggested that they indeed do remembered the incident. Craig et al, 1984 and Levy, (1996) in their experimental evidences and clinical experiences have shown apprehensive behavior by children of 6 months in situations in which pain has been previously inflicted.

Response to Medication and Trauma

Developmental physiologic changes appear to alter the impact of medication used for pain and the physiologic response to trauma such as surgery. The pharmaco-kinetics and response of neonates to opioids are age dependent. Young children (who are treated for pain) report less distress and return to normal activities more quickly following tonsillectomy than do older children and adolescents.

Development of Pain Syndromes

Certain pain syndrome tends to occur at different ages but pain like postoperative pain is not age linked. Abdominal colic, which appears to be a pain disorder, occurs only in the first few months of life. Pain of teething is restricted to the young child (Geertsma and Hyam, 1986). In middle childhood, recurrent abdominal pain and growing pains are the most prominentpain problems. In adolescence, head ach and chest pain become more frequent. In late childhood, gender difference emerges and females begin to dominate in incidence f most painful syndromes.

Cognitive Development

Children's cognitive development influences their pain in 3 ways.

1. Young children have a different understanding of the nature, treatment and cause f pain.
2. Specific treatment such as cognitive therapy for headaches requires levels of cognitive ability not available to young children
3. The ways that children communicate about pain depend on their cognitive development

Pain and Parental Coping

Literature related to pain in children and parental coping could not be found in the literature. However literature related to stress and parental coping in neonatal intensive care unit and other areas could found which are related to present study.

Ruth et al, (1997) conducted a study on parents of neonates and children admitted to NICU and PICU with various problems. The sample consists of 31 NICU and 20 PICU parents. Parents in both units experienced the most stress from alteration in parenting role and their infant's behavior and appearance. Parents of children in PICU found assistance with parenting role more helpful than parents of neonates in NICU. Parents with children in PICU perceived problem focused coping more helpful than parents of neonates in the NICu; parents of babies in NICU found emotion – focused coping more helpful than parents of children on PICU. But parents in both groups considered problem – focused coping more helpful than appraisal or emotion focused coping. Fisher, (1994) found that parents of children hospitalized in a PICU felt that knowing about their child's prognosis, why things were done for their child , feeling there was hope and knowing their child was treated for relief of pain were most important needs. Lewandowski, (1980) identified six coping styles used by parents of children who had open heart surgery:

1. Initial immobilization
2. Visual survey
3. Withdrawal
4. Restructuring
5. Assistance and
6. intellectualization

Affleck, Tennen and Rowe, (1991) found that majority of mothers sought support from others and tried to assign meaning for why this happened to them.

Miles,(1985) also identified six coping strategies used by parents of children in the PICU: believing that their child is getting the best care possible, seeking information, asking questions to the staff, being near their child as much as possible, praying and making sure that their child is getting the best possible care. Philichi, (1989) reported that parents perceptions of their family's coping abilities were higher than that of norm, possibly because the admission to the PICU was a crisis situation. Carnevale, (1990) identified cognitive, interpersonal, social support, direct action and environmental help as coping strategy themes used by parents of children in a PICU. Miles, Carlson and Funk,(1990) found that highest source of support for parents of children in NICU was other parents of children admitted there. Other important sources of support included NICU nurses and physicians and child's grand parents. La Montagne and Pawlak, (1990) found that all parents of children in PICU used a combination of problem and emotion focused form of coping. Lynda et al, (1992) investigated the relationship of locus of control, parental age and state anxiety to parental coping and activities performed during hospitalization of a child in a paediatric critical care unit, they found that less anxious , self directed parents used coping strategies focusing on problem solving rather than on their emotional response to child's hospitalization.

Carolyn. Linda, Judith and Jeanette, (1996) did an assessment of pain coping styles for development of an inventory , called The Pain Coping Style Inventory (PCSI) to measure the pain coping style of individuals. A study with a convenience sample of 145 university graduates revealed Cronbach's alpha reliability coefficient

of 0.90. Coping with pain is defined by Brown and Nicassio, (1987) as the specific thoughts and behaviors people use to manage their pain. Lipowski, (1989) defined coping style as an individual's enduring disposition to deal with challenges and stress with a specific constellation of technique. Research by Rosentiel & Keefe, (1983) was directed toward assessing the use of cognitive and behavioral pain coping strategies in patients with low back ache. They used the Coping Strategy Questionnaire (CSQ) to determine the extent to which subjects reported using six different cognitive coping strategies and two behavioral coping strategies. Jaloweic et al,(1984) developed Jaloweic Coping Scale, which consists of 40 coping behaviors to be rated on five point scale to indicate degree of use. Affective oriented strategies were used to deal with the distressing emotions being experienced.

CHAPTER 111

METHODOLOGY

- RESEARCH APPROACH
- DESIGN
- SETTING OF THE STUDY
- POPULATION
- SAMPLE AND SAMPLINF TECHNIQUE
- DATA COLLECTION TECHNIQUE
- RESEARCH TOOL
- PILOT STUDY
- DATA COLLECTION PROCESS
- PLAN OF DATA ANALYSIS

METHODOLOGY

The investigator aims at developing a tool to assess postoperative pain in children in two groups as infants (0-1 year) and children (2-5 years) and the parental coping towards postoperative pain in these children in a selected hospital at Calicut in the present study. This chapter gives a description of the research approach adopted, research design, setting of the study, population, sampling, research tools, pilot study, data collection process and plan of data analysis.

Research Approach

A non experimental descriptive approach was chosen as the study is based on ongoing events of the present. A tool was developed to quantify postoperative pain in infants and children based on previous observations in literature and certain parameters present in the post operative child with pain and parental coping towards postoperative pain in their children without manipulation of any variable under study.

Research Design

The investigator adopted descriptive correlational design as this study tried to explain relationship between various variables under study to assess postoperative pain in infants and children and its relation to parental coping. The study was designed as a descriptive correlational study with the intent to explain the variables that may influence criterion variable. This design also permits the investigator for the consideration of several variables and their interrelationship simultaneously and in a realistic setting for the present study.

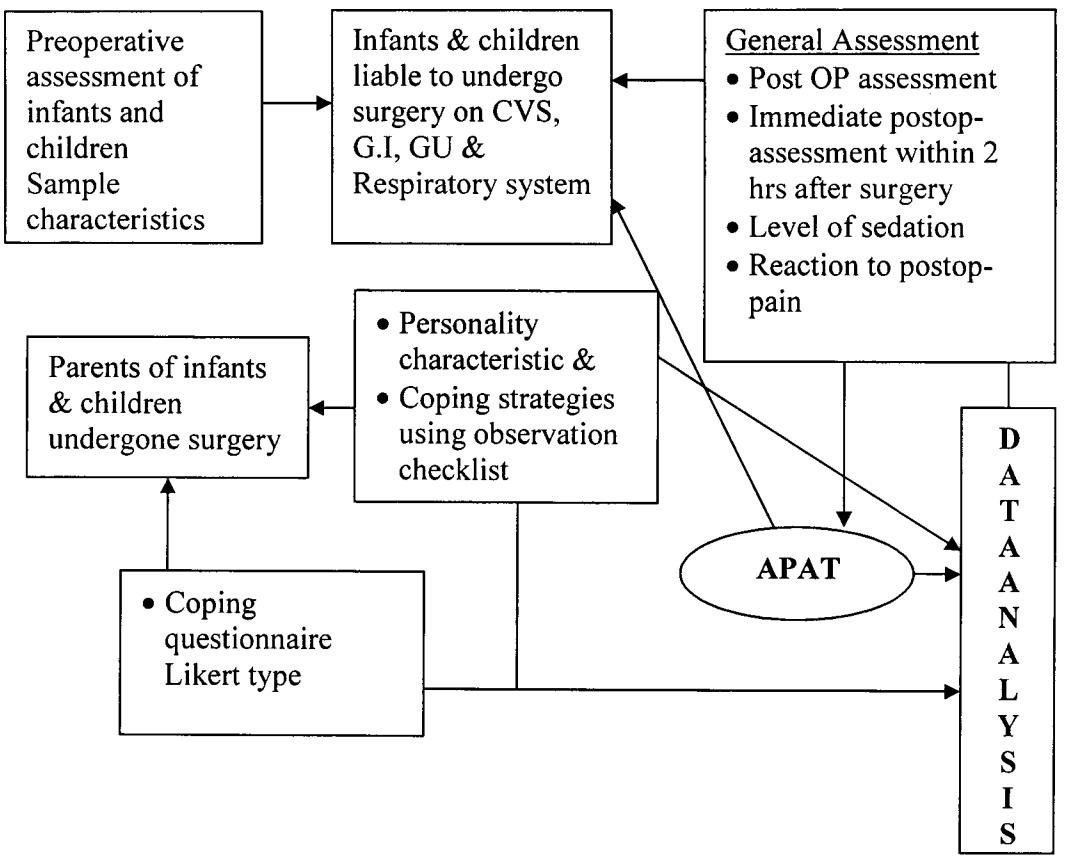

Figure 2. Schematic Representation of the Study

Setting of the Study

The study was conducted in the Institute of Maternal and Child Health (IMCH), Medical College, Calicut. It is one of the biggest children's hospitals in the state of Kerala. IMCH has bed strength of 740. Averages of 100 children attend the paediatric surgical out patient department. Out of which an average of 10-15 children are admitted daily for various surgical interventions. About 4000 major paediatric surgeries are conducted at IMCH during the year 2002-2003. All children undergoing surgery are accompanied by their parents as a routine.

Population

In the present study the population constituted infants (0-1 year), children (2-5 years) and their parents who are liable to be there in the unit 48 hours after surgery admitted in paediatric surgical wards of IMCH, Calicut.

Sample and Sampling Technique

Sample

A sample of 300 children (150 infants of 0-1 year and 150 children from 2-5 years) who had undergone surgery within the previous 48 hours and their parents were taken for the study because of the easy availability of the sample, homogeneity of the population and to fulfill the set inclusion criteria.

Sampling Technique

Purposeful sampling is used (picking Ss believed by the researcher to be representative)

Criteria for Inclusion and Exclusion

Inclusion Criteria

1. Infants (0-1 year) and children (2-5 years) who are liable to be there in paediatric surgical unit for 48 hours after surgery
2. Infants and Children who had undergone thoracic (cardiovascular), gastrointestinal, genitourinary and respiratory system surgeries within 48 hours after surgery between the age group of 0-1 year and 2-5 years and their parents admitted at paediatric surgical wards of IMCH, Calicut.
3. Parents willing to participate in the study
4. Parents who can read and understand Malayalam

Exclusion Criteria

1. Infants and Children and their parents where children had undergone surgery on other systems other than those mentioned in inclusion criteria.
2. Children who had completed more than 48 hours after surgery
3. Children and their parents who had not consented to participate in the study

Data Collection Technique

Physical assessment, physiologic monitoring, observation and self reporting

Research Tool

Tools used were observation check list including APAT and coping questionnaire.

Description of the Tool

The observation check list is divided in to 5 sections. The first deals with demographic data of the child. The second section deals with the results of general assessment of the child before surgery. The third section is postoperative assessment that include general status, type of surgery and level of sedation using Doherty's sedation scale, words used by verbal children to describe pain and the question related to whether appropriate preoperative preparation given or not. The fourth part includes APAT (described below) and 5th section includes observation parameters of coping strategies used by parents of children with postoperative pain.

APAT (age appropriate pain assessment tool)

It was prepared separately for preverbal (infants -1 year) and verbal children (2-5 years). All the sections of the tool were tested for validity and reliability. But APAT was specifically concentrated as this is the major part of the tool.

Content validity of APAT was estimated with the help of five experts in the field of health. The experts were chosen based on their practical and academic knowledge and the domain of interest. Two of the experts were senior paediatric surgeons having an experience ranging from 15-20 years in the field of paediatric surgery. Two of them were paediatric nurses having post masters education in paediatric nursing and had wide range of experience in paediatric nursing (especially in using pain assessment scales) of 16-20 years both in India and abroad. The other expert was from Pain and Palliative Care Unit at Medical college campus, Calicut. Each of them was given the whole tool with APAT for infants and children separately

with objectives of the study. The experts were asked to rate each item's relevancy to the objectives provided using a four point rating scale ranging from most relevant to not relevant. They were also asked to comment on whether the scope of items truly needs to be added. APAT for infants contained 21 items and the other contained 23 items. 87% of the items (18 numbers) in APAT for infants were rated as most relevant, 2 items was asked to be deleted by all of them (that one including feeding/ sucking). With the elimination of these 3 items the content validity index (CVI) of APAT for 0-1 year with 18 items was 1.00. The percentage of agreement was 87%.

APAT for children with 2-5 years had 23 items. Experts rated 2 items as not relevant and the other 21 items as most relevant. With elimination of these two items, the CVI of APAT for children2-5 years was 1.00. The percentage of agreement for APAT for children 2-5 years were 95%.

Construct validity was tested with group contrast method and data analysed using test of significance. The't' test value was<0.6 level. The inter rater reliability was tested by administering the tool simultaneously by 2 observers at the same time. Stability estimation focused on simultaneous observation of the same patient at same time. A total of 50 subjects were observed from both groups (0-1 year age group, 25 subjects and 2-5 years age group 25 subjects). The relationships of observations were calculated using Carl Pearson's correlation coefficient with column headings representing judges and raw headings representing scores of observations. APAT for 0-1 year had a coefficient value of 0.98 and APAT for 2-5 year group had a value of coefficient 0.99 and APAT for both groups were found to be reliable.

Coping questionnaire has two parts. The first part contains the demographic data of the parents included in thestudy. The second part contains questions related to coping strategies. The demographic profile of the coping questionnaire contains items that include age, background, education main occupation, monthly income, type of family, marital status, age of marriage and quality of marital life.

The questionnaire was framed on a Likert type format that allows clarification and elaboration within narrow limits with a 5 point scale ranging from nil to very high. The questionnaire was initially prepared with 50 questions. After expert consultations, 8 questions were omitted as they were found to be not relevant. So a total of 42 items were included in the questionnaire having from major division with subdivisions, each having questions ranging from 1-6 as given below.

Table 4

Categorization of Coping Questionnaire

Items	Subdivisions	Number
1. Caring stress and coping	a. Extra input of care and coping	5
	b. Neglect of others care in the family and coping	4
	c. Disturbed behavior of the child and coping	3
2. Pain induced emotional stress and coping	a. Personal distress and coping	6
	b. Pain distress and coping	5
	c. Knowledge distress and coping	5
	d. Marital problems and coping	4
3. Social stress and coping	a. Altered social life and coping	5
	b. Interpersonal problems and coping	1
4. Financial stress and coping	a. Financial implication and coping	4

The interview questionnaire is prepared as factually oriented with Folkman and Lazarus's view on stress and coping which is aimed at obtaining specific information and made relatively brief with 42 questions.

Content Validity

The tool was submitted to five experts for content validity. The experts included a child psychiatrist, two clinical psychologists and two nursing experts. They were requested to give their comments on the adequacy of the content, relevance, appropriateness and duty of items included, by providing them with objectives of the study and the tool prepared by the investigator.

There was no difference of opinion regarding the 8 items in the demographic data. Out of 50 items in the coping questionnaire, 42 items had 100% agreement. Eight items were coded not relevant by three experts and the other two experts as weakly relevant. These eight items were deleted and the final questionnaire consisted of 42 items.

Translation

The final coping questionnaire was translated to Malayalam with guidance of a Malayalam expert.

Pre-testing

The tool was administered to 24 parents of postoperative children for pre-testing (12 for parents of infants 0-1 year of age and 12 for parents of children 2-5 years of age.

Reliability

Reliability was ensured determining the internal consistency using Cronbach's alpha calculating the individual item variance and test variance. Reliability for a coping questionnaire for both groups was found to be 0.87 and the questionnaire was said to be reliable

Pilot Study

The pilot study was conducted at the IMCH, Calicut during the period 8/8/2001 to 8/9/2001 after obtaining administrative sanction. After explaining the purpose of the study and obtaining permission, 25 subjects from each group (0-1 year and 2-5 years) and their parents were studied using the tool developed by the investigator. The observed data and expressed data were graded. Data collected were tabulated and subjected to statistical analysis. The results of the pilot study showed that the tool was reliable and the study feasible.

Data Collection Process

Formal administrative sanctions were obtained from the Principal, Medical College and the Head of department, Paediatric surgery, IMCH, Calicut. Data were collected during the period from 1/12/2001 to 1/8/ 2002. The investigator herself administered the tool to the subjects. Subjects were contacted mostly on week days from 4-6 pm except on Sundays and Mondays. After establishing rapport, the purpose of the study was explained and consents to participate obtained. The administration of the tool took 55-65 minutes totally. For administering coping questionnaire it took

only 15-20 minutes. Responses of observation and interview were noted by the investigator.

Plan for Data Analysis

The data collected was analyzed using descriptive and inferential statistics. Demographic data was analysed using frequencies and percentages.

Pearson's χ^2 test of Significance and paired 't' test was used to analyze the APAT and coping questionnaire of parents. Relationship between pain in postoperative children and their parent's coping towards pain was determined by Pearson's correlation coefficient.

CHAPTER IV

ANALYSIS AND INTERPRETATION

ANALYSIS AND INTERPRETATION

The study was intended to develop an age appropriate postoperative pain assessment tool for infants (0-1 year) and children (2-5 years) and assess parental coping towards postoperative pain in their children. The data were analysed and interpreted using descriptive and inferential statistics based on objectives of the study.

The findings of the study are organized under the following headings with three parts as part I, part II and part III with different sections.

Part I

It has 8 sections as follows

Section I- Sample characteristics of infants under study

Section II- Postoperative Pain assessment of infants with APAT

Section III- Relationship between APAT score of postoperative infants and selected demographic variables of infants

Section IV- Sample characteristics of parents of postoperative infants

Section V- Coping strategies and coping behaviors of parents of postoperative infants Section VI- Relationship between selected demographic variables of parents of postoperative infants with pain and their coping strategies and coping behaviours

Section VII- Relation between parental personality characteristics and parental coping towards postoperative pain in infants

Section VIII- Relationship between parental coping and APAT Score of infants

Part II

Deals with details of postoperative children and their parents

Section I- Sample characteristics of children (2-5 years)

Section II-Postoperative Pain assessment of children (2-5 years) with APAT

Section III- Relationship between APAT score of postoperative children and selected demographic variables of them

Section IV- Sample characteristics of parents of postoperative children

Section V- Coping strategies and coping behaviors of parents of postoperative children

Section VI- Relationship between selected parental characteristics of children with postoperative pain and their coping strategies and coping behaviours

Section VII- Relation between personality characteristics of parents of children and their coping towards postoperative pain in their children.

Section VIII- - Relationship between parental coping and APAT Score of children with postoperative pain and

Part III

Deals with descriptive statistics and one way analysis of both groups.

Part I

Section I Sample characteristics of infants

This section deals with the sample characteristics of infants under study including their birth history and postoperative assessment

Table 5

Distribution of Infants based on Demographic Characteristics

N= 150

Characteristics	Frequency	Percentage
Age		
1 month	6	4
2months	1	0.66
3months	7	4.66
4months	11	7.3
5months	3	2
6months	20	13.3
7months	13	8.6
8months	46	30.66
9months	20	13.3
10months	3	2
11months	7	4.66
12months	13	8.6
Sex		
Male	88	58
Female	62	41.3

(Table continues)

Table 5 (continued)

Characteristics	Frequency	Percentage
Religion		
Hindu	76	50.7
Muslim	55	36.7
Christian	19	12.7
Order of birth		
First	47	31.3
Second	83	55.3
Third	20	13.3
Fourth	-	-
Others	-	-
Number of sibs		
Nil	9	7.5
One	48	40
Two	57	47.5
Three	6	5
Others	-	-
Immunizations		
Complete	113	75.3
Incomplete	37	24.7

(Table continues)

Table 5 (Continued)

Characteristics	Frequency	Percentage
Not immunized	-	-
Preoperative system complaints		
Gastrointestinal system		
Normal	58	38.7
Abnormal	92	61.3
Cardiovascular system		
Normal	144	96
Abnormal	6	4
Respiratory system		
Normal	144	96
Abnormal	6	4
Genitourinary system		
Normal	107	71.3
Abnormal	43	28.7

Majority of infants (33.8%) belong to the age group of 8 months. 58.7% of infants under study were males. 50.7% of parents of infants were Hindus. 55.3% of infants were second born babies of their parents. 47.5% of babies had two sibs. 75.3% of infants were completely immunized as per age. 61.3% of babies had gastrointestinal problems under study.

Table 6

Distribution of Infants (0-1 year) Based on Birth History

N= 150

Characteristics	Frequency	Percentage
Type of delivery		
Vaginal delivery	76	50.7
Assisted vaginal delivery	40	26.7
Caesarian section	34	22.7
Condition at birth		
No abnormality detected (NAD)	134	89.3
Abnormality present at birth	16	10.7
Birth injuries/ complications		
NAD	134	89.3
Abnormality	16	10.7
Presence of jaundice		
Not Present	148	98.7
Present	2	1.3
Congenital anomalies		
NAD	81	54
Abnormality	69	46
Gestational age at birth		
Full term	115	76.6
Pre term	35	23.3
Weight at birth		
Normal	136	90.7
Small for date	14	9.3
Low birth weight	-	-

(Table continues)

Table 6 (Continued)

Characteristics	frequency	percentage
Large for gestational age	-	-
Present weight		
Normal for age	134	89.3
Less for age	16	10.7
More for age	-	-
Nutrition		
Breast feeding	41	27.3
Formula feeding	-	-
Complementary feeding	109	72.7
Sleep pattern		
Normal	150	100
Abnormal	-	-
Elimination pattern		
Bowel		
Normal	128	85.3
Abnormal	22	14.7
Bladder		
Normal	101	67.3
Abnormal	49	32.7

The findings show that 50.7% of infants were delivered vaginally. 89.3% of babies had no abnormalities detected at birth10.7% of the babies had birth injuries. 46% of infants were born with congenital anomalies. 76.6% of the babies were full term and 90.7% of babies had normal birth weight.72.7% of the babies were on

complementary feeds. All the babies had normal sleeping pattern preoperatively. 85.3% of babies had normal bowel elimination pattern and 67.3% had normal bladder elimination.

Table 7

Distribution of Infants based on Postoperative Assessment

N= 150

Characteristics	Frequency	Percentage
General status		
Satisfactory	150	100
Type of surgery		
Major	142	94.7
Minor	8	5.3
Level of sedation		
No response to loud - and verbal stimuli	-	-
Asleep, sluggish - response verbal stimuli	5	3.3
Asleep, brisk response- to verbal stimuli	17	11.3
Awake and calm	35	23.3
Restless	62	41.3
Anxious, agitated	31	20.7
Reaction of the infant		
Protest	134	89.3
Denial	16	10.7
Despair	-	-
Withdrawal	-	-

General status of all infants immediately after surgery was satisfactory. Majority (41.3%) of infants were restless as far as the level of sedation was concerned. 94.7% of infants had major surgeries. 89.3% of infants exhibited protest as their reaction to pain.

Section I1 Postoperative Pain assessment of infants with APAT and classification of infants based on APAT score

This section deals with analysis of data regarding postoperative pain characteristics in infants (0-1 year)

Table 8

Frequency and Percentage Distribution of Infant's (0-1 year) Pain Characteristics based on APAT N= 150

Characteristics	Frequency	Percentage
Respiratory characteristics		
Respiratory rate		
Increased up to 5-10 per minute	28	18.7
Increased more than 10 per minute	122	81.3
Respiratory secretions		
Normal	16	10.7
Slight increase	108	72.0
Drooling	26	17.3
Coughing/ gagging		
No hiccough	62	41.3

(Table continues)

Table 8 (Continued)

Characteristics	Frequency	Percentage
Slight increase	88	58.7
Hiccough	-	-
Heart rate		
Normal	-	-
Increase up to 15 per minute	70	46.7
Increase more than 15 per minute	80	53.3
Blood pressure		
Normal	80	53.3
Increased up to 15 mm of Hg	70	46.7
Increased more than 15 mm of Hg	-	-
Diaphoresis		
Normal	-	-
Increased minimally	30	20
Markedly increased	120	80
Pallor		
No pallor	63	42
Slight pallor	72	48
Noticeable circumoral pallor	15	10
Pupil size		
Normal	63	42
Dilated minimally	87	58
Dilated markedly	-	-
Tearing		
No tearing	-	-
Tears inside the cantus	33	22

(Table continued)

Table 8 (Continued)

Characteristics	Frequency	Percentage
Excessive tearing	117	78
Rigidity		
No rigidity	2	1.3
Rigidity in extremities	55	36.7
Whole body rigidity	93	62
Temperature		
Normal	44	29.3
Slight increase	105	70
Marked increase	1	0.7
Facial expression		
Face composed	-	-
Face distorted	20	13.3
Facial grimace	130	86.7
Crying		
No cry	-	-
Moaning	52	34.7
Crying continuously	98	65.3
Consolability		
Content and relaxed	3	2
Reassurable	111	74
Difficult to console	36	24
Sleep		
Active sleep	2	1.3
Drowsiness	128	85.3
Awake and crying	20	13.3

(Table continued)

Table 8 (Continued)

Characteristics	Frequency	Percentage
Touching painful areas		
Not touching	-	-
Touching	54	36
Pulling site/ guarding	96	64
Miscellaneous characteristics		
Parents request for pain medication		
No request	66	44
Occasional request	54	36
Timely request	30	20
Pain medication		
No medication	95	63.3
SOS medication	55	36.7
Scheduled medication	-	-

The findings showed that all the postoperative infants had change in respiratory rate with postoperative pain. 81.3%of infants had an increase of more than 10 breaths per minute. When considering respiratory secretions, 72% of infants after surgery had mild increase in respiratory secretions. 58.7% of infants had slight cough and none had hiccough with postoperative pain. All infants had change in pulse rate. 53.3% of infants had an increase of pulse rate more than 15 per minute. 53.3% of infants had normal blood pressure while 46.7% of infants had an increase of blood pressure up to 15 mm of Hg. All infants had diaphoresis. Out of these, 80% of infants had marked diaphoreses postoperatively. 48% of infants showed

slight pallor while only 10% had noticeable circumoral pallor. All infants with postoperative pain showed lacrimation with 78% with excessive lacrimation/ tearing. 62% of infants had whole body rigidity and 70% infants had slight increase in temperature with postoperative pain. Although all infants after surgery showed signs and symptoms of pain, only 20% parents made a timely request for pain medication. 36% of parents made occasional request. None of the babies had scheduled pain medication. 36.7% of babies were provided when ever necessary pain medications and 63.3% of infants had no pain medication at all.

Table 9

Classification of Infants based on APAT Scores

APAT Score	Frequency	percentage
Low	19	12.7
Medium	98	65.3
High	33	22
Total	150	100

Analysis of data on pain score showed that 65.3 % of infants had medium pain.

Section III Relationship between APAT Score and Selected Demographic Variables of Infants

Paired sample correlations and paired T test were done to determine the relation between the preoperative vital signs and postoperative vital signs. The following hypothesis was formulated

H_{01} There is no relationship between preoperative vital signs and postoperative vital signs of infants with pain.

Results are presented in Tables 6 and 7

Table 10

Paired Sample Correlations of Preoperative and Postoperative Vital Signs

Vital signs	N	Correlation	significance
Pair 1- pre-RR& post RR	150	-.121	0.139
Pair 2 pre PR & post PR	150	0.009	0.915
Pair 3 pre S BP & post S BP	150	0.113	0.169
Pair 4 pre D BP& post D BP	150	0.240	0.003
Pair 5 pre Temp & post Temp	150	0.000	1.000

PR- Pulse rate

RR- Respiratory rate

SBP- Systolic Blood pressure

DBP- Diastolic Blood pressure

Temp- Temperature

Table 11

Paired Sample Test of Preoperative and Postoperative Vital Signs (respiration, pulse, blood pressure and temperature)

Vital signs	Mean	SD	SE	t	df	P
Respiration	-13.08	4.28	0.35	-37.404	149	0.000*
Pulse	-16.93	137.14	11.20	-1.512	149	1.333
Systolic BP	-1.47	2.24	0.18	-8.031	149	0.000*
Diastolic BP	-0.28	4.33	0.35	-792	149	0.430*
Temperature	-355	0.235	1.921E-02	-18.458	149	0.000*

Analysis of data on preoperative and postoperative vital signs showed that there is high significance between preoperative and postoperative values on respiratory rate, systolic blood pressure and temperature. Hence it is concluded that there is significant alteration in vital signs of infants with postoperative pain as compared to preoperative vital signs and the $H_0$1 rejected.

Table 12

Chi- Square test of Significance showing the Association between APAT Score and Selected Variables of Infants.

N= 150

Parameters	Pearson Chi- Square Value	df	Asymp. Sig (2 tailed)
Sex	3.952	2	0.139
Religion	6.131	4	0.190
No. of sibs	6.329	6	0.387
Immunization	3.495	2	0.174
System disorders	4.817	2	0.090
Type of delivery	3.035	4	0.552
Condition at birth	23.246	2	0.000*
Birth order	10.367	4	0.035*
Birth complications	23.246	2	0.000*
Nutrition	16.286	2	0.000*
Reaction of the infant towards postoperative pain	23.742	2	0.000*

*Significant at 5% level.

From the findings it is concluded that the pain score(APAT Score) and the birth order are associated. From the data analysed it is seen that in all the groups (low, medium and high score) the percentage is higher especially it is highly significant in the second birth order and so also with medium score. 74.5% of infants getting complementary feeds along with breast feeds presented a medium APAT score and

87.9% showed high score within groups as compared to infants on breast feeding alone with P value 0.000 and hence highly significant. 94.9% of the infants who had no abnormality related to birth complications got a medium APAT score while only 5.1% with birth complications showed a medium score of APAT within groups with P value 0.000 and is highly significant. So also with condition at birth where abnormality existed.

Postoperative infants with low (85.5%), medium (96.9%) and high (66.7%) APAT score had protest as reaction to postoperative pain concluding that a significant relation between the reaction of the child and their postoperative pain (P= 0.000) and highly significant. So it is concluded that there existed a relation between infant characteristics and the degree of postoperative pain. Hence the hypothesis that there is no relation between the infant characteristics and the degree of postoperative pain (H_0 2) is rejected for these variables and accepted for other variables like sex, religion, no. of sibs, type of delivery, immunizations and system disorders.

Section IV Parental characteristics of infants

This section deals with parent characteristics of infants under study.

Table 13

Distribution of Parents of Infants with Postoperative Pain based on Sample Characteristics

Characteristics	frequency F	percentage %
Type of family		
Joint	77	51.3
Nuclear	1	0.7
Three generation	72	48
Marital status		
Married	140	93.3
Remarried	3	2
Single/ widowed	7	4.7
Age of mother at marriage		
Before 20 years	127	84.7
Before 25 years	23	15.3
Age of father at marriage		
Before 25 years	45	30
Before 30 years	105	70
Age of mother		
19-23 years	24	16
24-29 years	70	46.7
30-34 years	31	20.7
35 & above	25	16.7
Place of residence		
Urban	105	70
Rural	45	30

(Table continues)

Table 13 (Continued)

Characteristics	Frequency F	Percentage %
Educational status		
Pre- primary	12	8
Middle	41	27.3
Secondary	19	12.7
Pre-university	18	12
Degree	39	26
Post graduate	18	12
Others	3	2
Main occupation		
Nil	83	55.7
Service	49	32.3
Others	18	12
Monthly income		
Below 1000	73	48.7
1001-3000	10	6.7
3001 & above	67	44.7

The findings on sample characteristics of parents of infants with postoperative pain showed that 51.3% of parents had joint family, 93.3% were married, 84.7% of mothers were married before 20 years, 70% of fathers were married before 30 years, 97.3% of parents had good married life, 46.7% of mothers were between the age of 24- 29 years, 70% of parents were urban dwellers, 55.7% of mothers were house

wives. Only 12% of parents were postgraduates. 48.7% had income below Rs 1000/- and 44.7% had income above Rs.3000/-.

Table 14

Distribution of Parents based on Personality Characteristics

N= 150

Personality characteristics	Frequency F	Percentage %
Nervous	43	28.7
Demanding	1	0.7
Agitated	14	9.3
Reasonable	92	61.3
Total	150	100

The findings showed that 61.3% of parents were reasonable.

Section V Coping strategies and coping behaviours of parents of infants with postoperative pain.

This section deals with coping strategies and coping behaviours used by parents of infants with postoperative pain.

Table 15

Frequency Distribution of Coping Strategies used by Parents of Infants with Postoperative Pain of their Infants

Coping strategies	No	Rarely	Manifest	Often	V-often
	F	F	F	F	F
Verbalize and seek-help from others	12	7	40	5	77
Avoidance and withdrawal	89	-	34	11	16
Seeking diversions	123	9	11	7	-
Engage in demanding-activities	77	61	9	3	-
Developing social-support	24	82	78	38	6
Crying and shouting	32	105	13	-	-
Irritated and agitated	70	67	6	1	-
Seeking spiritual - support	-	23	44	74	9
Being humorous	-	-	-	-	-
Seeking support	9	28	43	47	27
From relatives					
Support system	9	28	43	47	27
Available					

The findings showed that 81.3% of parents of infants verbalize and seek help from others. Seeking spiritual support was used by 84.6% of parents. The interesting finding was no one used being humorous as a coping strategy.

Table 16

Distribution of Parents of Infants based on Coping Behaviors

Sl.No	Coping behaviours	Nil	Low	Mode-rate	High	Very high
		F	F	F	F	F
A	Extra input of care and coping					
1	Do you spend a lot of time in caring your child	18	5	41	54	32
2	Do you feel tired in comforting your child	10	49	32	54	39
3	Do you feel that there is disorganisation in your activities	9	6	45	51	39
4	Do you work more than usual	25	49	5	71	-
5	Do you feel that you do not have enough time for yourself	-	26	56	56	18
B	Neglect of others in the family and coping					

(Table continues)

Table 16 (Continued)

Sl.No	Coping behaviours	Nil	Low	Mode-rate	High	Very high
		F	F	F	F	F
1	Do you feel worried about other children at home	-	23	10	51	66
2	Do you feel that you are not giving adequate care to others at home	-	-	17	112	21
3	Does your other children complain and say that their needs are not fulfilled	9	4	61	72	4
4	Does your spouse complain about your neglect	65	45	17	23	-
C	Disturbed behaviour of the child and coping					
1	Does your child cry often which you can't console	19	16	24	82	9
2	Do you feel that your child is more demanding and taxing	-	-	-	53	97
3	Do you get distressed with your child's behaviour in pain	-	20	61	69	-

(Table continues)

Table 16 (Continued)

Sl.No	Coping behaviours	Nil	Low	Mode-rate	High	Very high
		F	F	F	F	F
11	Pain induced emotional stress and coping					
A	Personal distress and coping					
1	Do you feel dependent on others	-	12	22	116	-
2	Do you talk less than normal	32	23	27	68	-
3	Do you talk more than usual	90	45	1	-	4
4	Do you become short tempered	-	-	3	23	124
5	Do you feel more conscious about personal appearance	-	-	3	82	65
6	Do you feel angry/ resentful to God for your child's pain/ condition	-	-	16	22	112
B	Pain distress/ emotion focused distress and coping					
1	Do you repeatedly feel bad or curse yourself for your child's pain / suffering	-	-	9	132	9
2	Do you spend more time in prayers	13	7	22	45	63
3	Do you visit places of worship more frequently	3	58	28	43	13

(Table continues)

Table 16 (Continued)

Sl.No	Coping behaviours	Nil	Low	Mode-rate	High	Very high
		F	F	F	F	F
4	Are there any plan for new offerings to God at present	13	-	15	79	43
5	Do you spend more time in seeing T.V, listening music etc.	98	37	1	14	-
C	Knowledge deficit distress and coping					
1	Do you think that your child's condition will be improved with pain medication	-	27	32	91	-
2	Do you request for pain medication	21	24	32	73	-
3	Do you try to collect as much information about your child's operation and pain	46	52	39	13	-
4	Have you try to clarify from doctors and nurses about your child's condition	-	9	52	89	-
5	Have you try to discuss your child's sufferings to other parents of children with same condition	13	-	9	103	25
D	Marital problems					

(Table continues)

Table 16 (Continued)

Sl.No	Coping behaviours	Nil	Low	Mode-rate	High	Very high
		F	F	F	F	F
1	Does your spouse help you in looking after the child at hospital	59	66	44	21	4
2	Does your spouse blame you for child's hospitalisation	24	98	28	-	-
3	Do you fight over even trivial things regarding the care of your child	49	16	52	30	3
4	Has there any misunderstanding between you and your husband about your child	66	77	44	17	6
111	Social stress and coping					
A	Altered social life and coping					
1	Do you feel sad to be in the hospital with your child and not able to attend social events at your place	5	4	3	4	134
2	Have decided to seek help from your relatives/ friends	-	60	81	3	6
3	Have you approached your relatives/ friends for help/ support	13	34	56	-	-

(Table continues)

Table 16 (Continued)

Sl.No	Coping behaviours	Nil	Low	Mode-rate	High	Very high
		F	F	F	F	F
4	Have you discussed the treatment plan of your child with your relatives	65	64	21	-	-
5	Have you approached any social support system for help	20	61	59	10	-
B	Interpersonal problem and coping					
1	Has any misunderstanding occurred in the family about the care of your child at hospital	25	-	6	37	82
IV	Financial stress and coping					
1	Have you spent a lot of money on your child's treatment	-	-	-	-	150
2	Have you taken any loans	5	67	35	38	5
3	Have you used up any savings for treatment of your child	-	9	38	101	2
4	Do you feel that because of this operation and treatment, there has been a significant drain family financial resource?	-	2	4	8	136

Analysis of the data showed that all the parents of infants had varying degrees (low- very high) of coping difficulty with the caring stress of infants with postoperative pain. No parent did express coping difficulty related to their personal care. Parents had coping difficulty related to the care of other children and others at home (moderate to very high). 45.3% of the parents expressed that spouses are not making any complaints regarding negligence of their care. Disturbed behavior of infants in the pain also created coping difficulties in parents depicted by high to very high score. All the parents obtained moderate to very high score on varying degrees related to pain induced emotional stress and coping especially with personal distress and coping. 60.7% of parents had the feeling that infant's condition will be improved with pain medication. 74% of the parents requested for pain medication with a moderate to high coping score. 59.3% of the parents clarified their doubts about infant's condition with professionals. 68.7% discussed the condition of their infant with parents of other infants with same conditions. 39.3% of the spouses did not offer help for the care of postoperative infants. 83% of the spouses did blame the other (low to moderate score).56% of the parents expressed some sort of misunderstanding with their spouses. 89.3% of the parents obtained a very high score for being sad to be in hospital. 60% of the parents approached relatives for help. 57% of them discussed the treatment plan with relatives. 84% of the parents expressed that there were misunderstanding in the family related to the condition of their baby. All of them used their savings from moderate to very high level and all had expressed significant drain in their financial resources.

84.6% of the parents obtained moderate to very high score in coping problems related to care of other children at home and the time spend for the care of the sick infant with pain. 91.3% of the parents expressed that the other children at home complaints of the lack of their care. Parents expressed that the disturbed behaviour of the child was very stressful to cope and 76.6% of them found it difficult to see their baby in pain. All parents felt that their child had become more demanding and the care of the infant found to be taxing (86%).

Table 17

Classification of Parents based on Score on Coping Behaviors

N= 150

Classification	Frequency	Percentage
Low	32	21.3
Medium	95	63.3
High	23	15.3

Mean= 14.6067

The classification is done as low (mean- SD), medium (the score between low and high) and high (mean +SD). The findings showed that 63.3% (95) of parents exhibited moderate score in rating coping behaviors showing coping difficulties.

Section VI Relationship between selected demographic variables and parental coping of postoperative infants

This section deals with the relationship between selected demographic variables and parental coping of parents of infants with postoperative pain.

To test the association between the selected demographic variables and coping score of parents of postoperative infants with pain, the following hypothesis was formulated.

$H_0$3- there is no significant relation between the parental characteristics and parental coping of infants with postoperative pain.

Table 18

Chi- Square test of Association showing Relation between Coping Score and Selected Parental Characteristics (personality characteristics, age, education, main occupation, monthly income, type of family, marital status, background, age of marriage of father and mother and quality of marriage) of Parents of Infants.

N=150

Selected variables	χ2 value	df	Asymp. Sig (2 sided)
Personality	13.441	6	0.037**
Age	17.310	6	0.008**
Education	39.646	12	0.000**
Main occupation	23.021	4	0.000**
Monthly income	14.272	4	0.006**
Type of family	10.939	4	0.027**
Marital status	8.397	4	0.078
Background	4.363	2	0.113
Age of marriage (mother)	12.319	2	0.002**
Age of marriage (father)	0.644	2	0.725
Quality of married life	11.372	2	0.003**

** Significant at 5% level.

Data analysis showed that there is significant association between coping score and the selected variables like personality characteristics age, education, main occupation, monthly income, type of family, age of marriage of mother and quality of married life and hence the hypothesis ($H_0$3) was rejected.

To test the significance of APAT score of postoperative infants and coping score of parents the following hypothesis was formulated. $H_0$4- there is no relation between the APAT score of postoperative infants and the parental coping towards postoperative pain in their infants and the data collected were analysed using Chi-Square test of significance.

Table 19

Chi- Square test showing Association Between APAT Score of Infants and Parental Coping Score

N=150

Pain score		Parental Coping Score		
		Low	Medium	High
Low	count	14	7	1
	% within groups	63.3	31.8	4.5
Medium	Count	16	75	15
	% within groups	14.3	71.4	14.3
High	Count	3	13	7
	% within groups	13	56.5	30.4
Total	Count	32	95	23
	% within groups	21.3	63.3	15.3

From the data analysed it was shown that in all the scores (low, medium and high) the percentage is higher especially in the case off medium coping score.

Pearson Chi-Square value was 31.511 with degree of freedom 4 and P= 0.000. Significant at 5% level. Hence it is concluded that the APAT Scores and coping scores were associated and the hypothesis ($H_0$4) stated was rejected.

Part II

Section I Sample characteristics of postoperative children (2-5years)

Deals with sample characteristics of postoperative children (2-5years)

Table 20

Distribution of children based on demographic characteristics

N= 150

Characteristics	Frequency	Percentage
Age		
2 years	30	20
3 years	18	12
4 years	18	12
5 years	84	56
Sex: Male	110	73.3
Female	40	26.7
Religion		
Hindu	75	50
Muslim	70	46.7
Christian	5	3.3
Order of birth		
First	103	66.7
Second	41	27.3

(Table continues)

Table 20 (Continued)

Characteristics	Frequency	Percentage
Third	6	4
Fourth	-	-
Others	-	-
Number of sibs		
Nil	36	24
One	102	68
Two	12	8
Three	-	-
Others	-	-
Immunizations		
Complete	127	84.7
Incomplete	23	15.3
Not immunized	-	-
Preoperative system complaints		
Gastrointestinal system		
Normal	58	38.7
Abnormal	92	61.3
Cardiovascular system		
Normal	149	99.3
Abnormal	1	0.7
Respiratory system		
Normal	146	97.3
Abnormal	4	2.7
Genitourinary system		
Normal	94	62.7
Abnormal	56	37.3

The findings showed that 56% of the children were at the age of 5years. 73.3% were males. 50% of the parents of children were Hindus. 66.7%of them were first born child. And 68% had one sibling at home. 84.7% were completely immunized as per age. 61.3 % of the children had gastrointestinal system disorders. Only 0.7% of them suffer from cardiovascular anomalies. 2.7% of the children had respiratory system complaints and 37.3% of them had genitourinary system disorders.

Table 21

Distribution of Children based on Birth History

Characteristics	Frequency	Percentage
Type of delivery		
Vaginal delivery	110	73.3
Assisted vaginal delivery	24	14.3
Caesarian section	16	10.7
Condition at birth		
No abnormality detected (NAD)	125	83.3
Abnormality present at birth	25	16.7
Birth injuries/ complications		
NAD	127	84.7
Abnormality	23	15.3
Presence of jaundice		
Not Present	145	96.7
Present	5	3.3

(Table continues)

Table 21 (Continued)

Characteristics	Frequency	Percentage
Congenital anomalies		
NAD	56	37.3
Abnormality	94	62.7
Gestational age at birth		
Full term	144	96
Pre term	6	4
Weight at birth		
Normal	141	96
Small for date	3	
Low birth weight	6	4
Large for gestational age	-	-
Present weight		
Normal for age	112	74
Less for age	38	26
More for age		
Nutrition		
Breast feeding		
Formula feeding		
Complementary feeding		
Normal	150	100

(Table continues)

Table 21 (Continued)

Characteristics	Frequency	Percentage
Sleep pattern		
Normal	150	100
Abnormal	-	-
Elimination pattern		
Bowel		
Normal	138	92
Abnormal	12	8
Bladder		
Normal	114	76
Abnormal	36	24

Findings show that 73.3% of children under study were born vaginally and 83.3% had no problem at birth. 84.7% had no birth injuries.62.7%of them had congenital anomalies. 96% of them were full term and 80% of them had normal weight at present.

Table 22

Distribution of Children based on General Assessment

Characteristics	Frequency	Percentage
General appearance		
Normal	120	80
Abnormal	30	20
Height		
Normal	150	100
Respiratory rate		
Normal	150	100
Pulse rate		
Normal	150	100
Temperature		
Normal	150	100
Level of hydration		
Normal	150	100
Head/ nose/ throat	150	100
Endocrine system		
Normal	143	95.3
Abnormal	7	4.7
Respiratory system		
Normal	144	96
Abnormal	6	4
Cardiovascular system		
Normal	149	99.3

(Table continues)

Table 22 (Continued)

Characteristics	Frequency	Percentage
Abnormal	1	0.7
Lymph nodes		
Normal	147	98
Abnormal	3	2
Gastrointestinal system		
Normal	77	51.3
Abnormal	73	48.7
Neurological system		
Normal	148	98.7
Abnormal	2	1.3

The findings showed that majority of the characteristics of children before surgery were normal

Table 23

Distribution of Children based on Postoperative Assessment N= 150

Characteristics	Frequency	Percentage
General status		
Satisfactory	131	87.3
Unsatisfactory	19	12.7
Type of surgery		
Major	144	6
Minor		
Level of sedation		
No response to loud- and verbal stimuli	-	-
Asleep, sluggish - response verbal stimuli	2	1.3
Asleep, brisk response- to verbal stimuli	-	-
Awake and calm	22	14.7
Restless	85	56.7
Anxious, agitated	41	27.3
Reaction of the infant		
Protest	106	70.7
Denial	-	-
Despair	23	15.3
Withdrawal	21	14
Age appropriate preoperative preparation		
Given	113	75.3
Not given	37	24.7

56.7% of the children were restless related to level of sedation immediately after surgery. 52% of them used 'vedana' as the word to describe pain. 70.7% of the children showed protest as the reaction to pain. The general status of children (87.5%) immediately after surgery was satisfactory.

Section 11 Postoperative Pain assessment of children (2-5 years) with APAT

This section deals with analysis of data on pain characteristics and APAT Score

Table 24

Frequency and Percentage Distribution of Children (2-5 years) based on APAT Score

N= 150

Characteristics	Frequency	Percentage
Respiratory characteristics		
Respiratory rate		
Increased up to 5-10 per minute	18	12
Increased more than 10 per minute	132	88
Respiratory secretions		
Normal	9	6
Slight increase	128	85.3
Drooling	13	8.7
Coughing/ gagging		
No hiccough	61	40.7
Slight increase	89	59.3
Hiccough	-	-

(Table continues)

Table 24 (Continued)

Characteristics	Frequency	Percentage
Cardiovascular characteristics		
Heart rate		
Normal	-	-
Increase up to 15 per minute	61	40.7
Increase more than 15 per minute	89	59.3
Blood pressure		
Normal	29	19.3
Increased up to 15 mm of Hg	96	64.
Increased more than 15 mm of Hg	25	16.7
Diaphoresis		
Normal	8	5.3
Increased minimally	47	31.3
Markedly increased	95	63.3
Pallor		
No pallor	31	20.7
Slight pallor	103	68.7
Noticeable circumoral pallor	16	10.7
Pupil size		
Normal	73	48.7
Dilated minimally	77	51.3
Dilated markedly	-	-
Tearing		
No tearing	-	-
Tears inside the cantus	59	39.3
Excessive tearing	91	60.7

(Table continues)

Table 24 (Continued)

Characteristics	Frequency	Percentage
Rigidity		
No rigidity	-	-
Rigidity in extremities	77	51.3
Whole body rigidity	73	48.7
Temperature		
Normal	28	18.7
Slight increase	117	78
Marked increase	5	3.3
Clenched jaw		
Normal position	2	1.3
Occasional clenching	148	98.7
Wrinkled forehead	-	-
Behavioral characteristics		
Facial expression		
Face composed	-	-
Face distorted	36	24
Facial grimace	114	76
Crying		
No cry	1	0.7
Moaning	94	62.7
Crying continuously	55	75.3
Consolability		
Content and relaxed	2	1.3
Reassurable	113	75.3

(Table continues)

Table 24 (Continued)

Characteristics		Frequency	Percentage
	Difficult to console	35	23.3
Sleep			
	Active sleep	2	1.3
	Drowsiness	134	89.3
	Awake and crying	14	9.3
Touching painful areas			
	Not touching	-	-
	Touching	125	83.3
	Pulling site/ guarding	25	16.7
Vocalization of pain			
	Normal conversation	-	-
	Complaining of pain	141	94
	Screaming with pain	9	6
Miscellaneous characteristics			
Parents request for pain medication			
	No request	42	28
	Occasional request	108	72
	Timely request	-	-
Patient's request			
	No request	145	96.7
	Occasional request	5	3.3
	Timely request	-	-
Pain medication			
	No medication	42	28
	SOS medication	108	72
	Scheduled medication	-	-

88% of the children with postoperative pain had increase in respiratory rate more than 10/ minute and 87% of them showed slight increase in respiratory secretions. 59.3% of children had slight increase in cough and gag. 59.3% of children had increase in heart rate more than 15/ minute. A slight increase in blood pressure was shown by 64% of postoperative children. Marked increase in diaphoresis was manifested by 63.3% of the children postoperatively and 68.7% of them had slight pallor. Minimal dilatation of pupils was there for 51.8% of children. All the children manifested lacrimation/ tearing but 60.7% showed excessive lacrimation/ tearing. 51.3% of the children showed rigidity of extremities. 78% of the postoperative children had showed slight increase in temperature and 98.7% of them had occasional clenching. 76% of the postoperative children showed facial grimacing and 24% exhibited facial distortion. 62.7% of the children did moaning too. 72% of parents of the children registered occasional request for pain medications. 96.7% of the children never requested for pain medication. 72% of the children had whenever necessary medications prescribed.

Table 25

Distribution of Postoperative Children based on APAT Score

Classification of APAT score	Frequency	Percentage
Low	26	17.3
Medium	110	73.3
High	14	9.3

Mean = 21.6333

SD = 3.1906

73.3% of children had medium pain.

Section III Relation between the APAT score and the selected demographic variables of postoperative children with pain.

This section deals with relation between the APAT score and the selected demographic variables of postoperative children with pain.

Table 26

Chi- Square test of Significance showing Association between APAT Score and selected Demographic Variables of Children (2-5 years)

Selected demographic variables	Pearson χ^2 value	Df	Asymp. Sig. 2 tailed
Sex	2.043	2	0.359 NS
Religion	5.760	4	0.218 NS
Birth order	2.536	4	0.638 NS
No. of sibs	6.111	4	0.191 NS
Immunization	0.390	2	0.823 NS
Gastrointestinal system	0.339	2	0844 NS
Cardiovascular system	0.366	2	0.833 NS
Respiratory system	1.494	2	0.474 NS
Genitourinary system	0.507	2	0.776 NS
Type of delivery	0.286	4	0.991 NS
Condition at birth	7.763	2	0.021* S
Birth injuries	1.660	2	0.436 NS
Presence of jaundice	1.5558	2	0.459 NS
Congenital anomalies	2.164	2	0.339 NS
Gestational age at birth	1.747	2	0.417 NS

(Table continues)

Table 26 (Continued)

Selected demographic variables	Pearson χ^2 value	Df	Asymp. Sig. 2 tailed
Bowel elimination	2.425	2	0.297 NS
Bladder elimination	3.151	2	0.207 NS
Reaction towards pain	9.552	4	0.0409*S

- *S- significant
- NS – not significant

Analysis of data showed that only two demographic variables are significantly associated to APAT score of children and hence the hypothesis H_0 5 is rejected for these factors as condition at birth and reaction of children towards postoperative pain.

To test the significance between preoperative vital signs and the postoperative vital signs the following hypothesis ($H_0$6) was formulated that there is no significant alteration in vital signs with postoperative pain.

Table 27

Paired Sample Correlations of Preoperative and Postoperative Vital Signs of Children 2-5 years

Vital signs	N	Correlation	Significance
Pair 1- pre-RR& post RR	150	0.889	0.000
Pair 2 pre PR & post PR	150	0.390	0.000
Pair 3 pre S BP & post S BP	150	0.911	0.000
Pair 4 pre D BP& post D BP	150	0.868	0.000
Pair 5 pre TEM & post TEM	150	0.253	0.002

RR=Respiratory Rate, PR= Pulse Rate, SBP=Systolic Blood Pressure
DBP= Diastolic Blood Pressure, TEM= Temperature

Paired sample correlations have shown high significance with pre and postoperative vital signs

Table 28

Paired Sample 't" test of Preoperative and Postoperative Vital Signs (respiration, pulse , blood pressure and temperature) of Children 2-5 years

Vital signs	Mean	SD	SE	t	dfp	P value
Respiration	-5.39	1.90	0.15	-34.798	149	0.000
Pulse	-10.85	7.14	0.58	-18.618	149	0.000
Systolic BP	-1.46	0.81	6.60E-02	-22.132	149	0.000
Diastolic BP	-1.55	0.83	6.79E-02	-22.873	149	0.000
Temperature	-0.739	0.268	2.186E-02	-33.825	149	0.000

Analysis of data on preoperative and postoperative vital signs (table 23 &24) showed that there is high significance between preoperative and postoperative values on respiratory rate, pulse, systolic blood pressure and temperature in contrast to postoperative infants where pulse had shown no significant change. Hence it is concluded that there is significant alteration in vital signs of children with postoperative pain and the $H_0$6 rejected.

Section IV Sample characteristics of parents of children with postoperative pain

This section deals with the parental characteristics of children with postoperative pain

Table 29

Distribution of Parents of Children with Postoperative Pain based on Sample Characteristics

Characteristics	Frequency F	Percentage %
Type of family		
Joint	70	46.7
Nuclear	-	-
Three generation	80	53.3
Marital status		
Married	145	96.7
Remarried	3	2
Single/ widowed	2	1.3

(Table continues)

Table 29 (Continued)

Characteristics	Frequency F	Percentage %
Age of mother at marriage		
Before 20 years	123	82
Before 25 years	27	18
Age of father at marriage		
Before 25 years	53	35.3
Before 30 years	97	64.7
Age of parent participated in the study		
19-23 years	28	18.7
24-29 years	47	31.3
30-34 years	50	33.3
35 & above	25	16.7
Place of residence		
Urban	84	56
Rural	63	42
Semi urban	3	2
Educational status		
Pre- primary	12	8
Middle	41	27.3
Secondary	19	12.7
Pre-university	18	12
Degree	39	26
Post graduate	18	12
Others	3	2
Main occupation		
Nil	98	65.3

(Table continues)

Table 29 (Continued)

Characteristics	Frequency F	Percentage %
Professional	3	2
Service	33	22
Others	16	10.7
Monthly income		
Below 1000	86	57.3
1001-3000	12	8
3001 & above	51	34.7
Quality of married life		
Good	147	98
Bad	3	2

The findings on sample characteristics of parents of infants with postoperative pain showed that 46.7% of parents had joint family, 96.7% were married, 82% of mothers were married before 20 years, 64.7% of fathers were married before 30 years, 98 % of parents had good married life, 33.3% (majority) of mothers were between the age of 30-34 years, 56% of parents were urban dwellers, 65.3% of mothers were house wives. Only 12% of parents were postgraduates. 57.3% had income below Rs1000/- and 34% had income above Rs3000/- per month.

Section V Coping strategies and coping behaviours of parents of children with postoperative pain

Table 30

Frequency Distribution of Coping Strategies used by Parents towards Postoperative Pain in their Children (2-5 years)

N=150

Coping strategies	No	Rarely	Manifest	Often	Very often
	F	F	F	F	F
Verbalize and seek help from others	28	2	44	75	50
Avoidance and withdrawal	78	-	43	3	26
Seeking diversions	139	5	5	1	-
Engage in demanding Activities	125	18	4	2	-
Developing social Support	88	51	10	1	-
Crying and shouting	54	89	7	-	-
Irritated and agitated	124	20	6	-	-
Seeking spiritual Support	-	37	50	61	2
Being humorous	-	-	-		-
Seeking support From relatives	6	31	37	48	28
Support system	6	31	37	48	28

The findings showed that 51.3% of parents of children verbalize and seek help from others. Seeking spiritual support was used by 49.3% of the parents. The interesting finding was that none of them used being humorous as a coping strategy.

Table 31

Distribution of Parents based on Personality Characteristics

N= 150

Personality characteristics	Frequency F	Percentage %
Anxious	4	2.7
Nervous	45	30
Calm and cool	13	8.7
Demanding	4	2.7
Agitated	28	17.3
Reasonable	58	38.7
Total	150	100

The findings showed that majority (38.7%) of parents were reasonable.

Table 32

Distribution of Parents of Postoperative Children 2-5 years based on Coping Behaviors

Sl. No	Coping behaviours	Nil	Low	Moderate	High	Very high
		F	F	F	F	F
A	Extra input of care and coping					
1	Do you spend a lot of time in caring your child	23	1	56	49	21
2	Do you feel tired in comforting your child	16	55	29	49	1
3	Do you feel that there is disorganisation in your activities	1	7	70	44	28
4	Do you work more than usual	29	72	1	39	9
5	Do you feel that you do not have enough time for yourself	-	25	98	24	3
B	Neglect of others in the family and coping					
1	Do you feel worried about other children at home	25	68	2	33	22
2	Do you feel that you are not giving adequate care to others at home	-	25	91	30	4

(Table continues)

Table 32 (Continued)

Sl. No	Coping behaviours	Nil	Low	Moderate	High	Very high
		F	F	F	F	F
3	Does your other children complain and say that their needs are not fulfilled	2	3	73	68	4
4	Does your spouse complain about your neglect	54	69	21	6	-
C	Disturbed behaviour of the child and coping					
1	Does your child cry often which you can't console	45	26	5	71	3
2	Do you feel that your child is more demanding and taxing	-	-	7	61	82
3	Do you get distressed with your child's behaviour in pain	-	-	26	88	36
11	Pain induced emotional stress and coping					
A	Personal distress and coping					
1	Do you feel dependent on others	-	53	22	75	-
2	Do you talk less than normal	28	31	68	23	-
3	Do you talk more than usual	137	10	-	-	3

(Table continues)

Table 32 (Continued)

Sl. No	Coping behaviours	Nil	Low	Moderate	High	Very high
		F	F	F	F	F
4	Do you become short tempered	-	-	2	25	123
5	Do you feel more conscious about personal appearance	-	-	12	135	3
6	Do you feel angry/ resentful to God for your child's pain/ condition	-	-	16	36	98
B	Pain distress/ emotion focused distress and coping					
1	Do you repeatedly feel bad or curse yourself for your child's pain / suffering	-	-	37	111	2
2	Do you spend more time in prayers	1	-	16	67	6
3	Do you visit places of worship more frequently	2	9	43	93	3
4	Are there any plan for new offerings to God at present	3	-	14	72	61
5	Do you spend more time in seeing T.V, listening music etc.	14	89	8	39	-
C	Knowledge deficit distress and coping					

(Table continues)

Table 32 (Continued)

Sl. No	Coping behaviours	Nil	Low	Moderate	High	Very high
		F	F	F	F	F
1	Do you think that your child's condition will be improved with pain medication	-	31	40	73	6
2	Do you request for pain medication	58	25	21	48	-
3	Do you try to collect as much information about your child's operation and pain	40	48	38	24	-
4	Have you try to clarify from doctors and nurses about your child's condition	9	10	65	66	-
5	Have you try to discuss your child's sufferings to other parents of children with same condition	18	14	26	55	37
D	Marital problems					
1	Does your spouse help you in looking after the child at hospital	27	63	45	25	-
2	Does your spouse blame you for child's hospitalization	6	97	13	16	18
3	Do you fight over even trivial things regarding the care of your child	12	4	103	31	-

(Table continues)

Table 32 (Continued)

Sl. No	Coping behaviours	Nil	Low	Moderate	High	Very high
		F	F	F	F	F
4	Has there any misunderstanding between you and your husband about your child	73	15	58	2	2
111	Social stress and coping					
A	Altered social life and coping					
1	Do you feel sad to be in the hospital with your child and not able to attend social events at your place	1	1	1	3	144
2	Have decided to seek help from your relatives/ friends	-	82	64	3	1
3	Have you approached your relatives/ friends for help/ support	4	26	72	48	-
4	Have you discussed the treatment plan of your child with your relatives	81	55	14	-	-
5	Have you approached any social support system for help	37	53	57	3	-
B	Interpersonal problem and coping					

(Table continues)

Table 32 (Continued)

Sl. No	Coping behaviours	Nil	Low	Moderate	High	Very high
		F	F	F	F	F
1	Has any misunderstanding occurred in the family about the care of your child at hospital	22	-	1	11	115
IV	Financial stress and coping					
1	Have you spent a lot of money on your child's treatment	-	-	1	144	5
2	Have you taken any loans	-	-	-	1	149
3	Have you used up any savings for treatment of your child	-	-	-	1	149
4	Do you feel that because of this operation and treatment, there has been a significant drain family financial resource?	-	-	-	-	150

37.3% (56) of parents had moderate stress in coping with the amount of time they spent in caring their postoperative child with pain. 36.7% (55) of the parents got moderate score when asked about comforting their child. Only 0.7% (1) of the parents found it is tiring to care their children with pain. 46.7% (70) of the parents felt that there is disorganization in their activities. 48% (72) of the parents had low score for work more than usual.65.3% (98) of the parents had moderate score on the

item not having enough time for them. 45.3% (68) of them had low score on their worry of the care of other children at home. Majority of parents (60.7%) had moderate difficulty in coping with inadequate care of others at home. 48.7% of the parents obtained moderate score in coping with complaints of other children about not fulfilling their needs. 46% of the spouses complaints about neglect of their care had given low score while 4% expressed high stress for coping. 54.7% (82) of the parents expressed high stress to cope as their child is found to be taxing and demanding. 58.7% (88) of the parents expressed high distress with pain behaviors of their children. 50% (75)of them felt dependency on others. 45.3% (68) of the parents talk less than normal when their children showed pain behaviors. only 2% of parents talked more than usual compared to majority of parents (91.3%) who had not manifested this behavior. 82% (123) of them had very high score for short temperedness with postoperative pain of their children. 90% of the parents had obtained high score on feeling about their personal appearance. 65.3% of parents had very high score on feeling angry to God for their children's sufferings. 74% of the parents scored high in feeling bad or curse themselves for the sufferings of their children . It was seen that the majority (89.4%) of the parents had spend more time in prayers expressing very high score. Parents visit places of worship more frequently (62% with high score). 80.7% of the parents had planned for new offerings to God for relief of their children's pain and sufferings. Only very few percentage would like to see TV or hear music. 52.7% of the parents had high opinion that their child's pain and sufferings would have been relieved if pain

medications were given adequately. Surprisingly though the parents had high opinion about administration of pain medication only 30.7% of them had requested for pain medication for their children. 26.7% of parents never collected information about child's condition. 87.3% (131) of parents could clarify their doubts from doctors and nurses. 61.4% of parents discussed their child's condition with parents of other children. 40% of parents had help from their spouses. 68.7% of parents fight over trivial things moderately. 48.7% of parents had no misunderstanding between them. Only 26% of the parents had high degree of misunderstanding between them. 96% of the parents expressed a very high degree of sadness to be in hospital .54.7% of them had not decoded to seek help from relatives. 48% of parents got a moderate score in approaching relatives for help. 54% of parents had low score for discussing the condition of the child with relatives. 38% of parents got moderate score for approaching social support system for help. Misunderstanding created in the family related to the child's condition yielded a very high score with 77.3% of the parents. Financial drain related to child's condition was very high for all families. 96% of the parents found it was highly stressful to cope with financial burden created with child's treatment and contributed for coping difficulties.99.3% of parents expressed a significant drain in their financial resources.

Table 33

Distribution of Parents based on Score on Coping Behaviors

N= 150

Classification	Frequency	Percentage
Low	28	18.7
Medium	93	62
High	29	19.3
Total	150	100

Mean= 12.6933

SD= 3.3276

The findings showed that 62% (93) of the parents obtained moderate score in rating coping behaviors exhibiting coping difficulties.

Section VI Relation between the parental characteristics and parental coping towards postoperative pain in children

This section deals with the relation between the parental characteristics and parental coping towards postoperative pain in their children.

To test the level of significance the following hypothesis ($H_0$7) was formulated as there is no significant relation between parental coping and parental characteristics.

Table 34

Relation between Parental Coping and Selected Demographic Variables of Parents of Postoperative Children (2-5years)

Variables	Chi-Square value	df	Asym: significance
Personality characteristics			
Age	5.917	6	0.433
Background	4.593	4	0.332
Education	16.470	12	0.171
Occupation	17.268	6	0.006*
Monthly income	7.795	6	0.254
Type of family	1.645	2	0.439
Marital status	7.896	4	0.095
Age of marriage (mother)	6.396	2	0.041*
Age of marriage (father)	7.389	2	0.025*
Quality of married life	1.069	2	0.586

Values with * marks showed high significance.

Analysis of data showed that there was no association between parental coping and factors such as background, education, income, type of family, marital status, quality of married life. But there existed a positive relation between parental coping and certain factors as main occupation of parents (p=0.006), and age of marriage of mother and father (p=0.041, 0.025 respectively). Hence it is concluded that the hypothesis $H_0$7is partly accepted and partly rejected.

Section VII Relation between the APAT score and parental coping towards postoperative pain in their children

This section deals with relation between the APAT score and parental coping towards postoperative pain in their children.

To test the level of significance a hypothesis ($H_0$8) was stated as there is no significant relation between APAT score of children and their parental coping.

Table 35

Chi- Square Test showing Association between APAT Score and Parental Coping Score of Postoperative Children 2-5 years with Pain

	Parental Coping Score			
Pain Score	Low	Medium	High	Total
Low count	7	18	1	26
% within groups	(26.9)	(69.2)	(3.8)	(100)
Medium Count	15	70	25	110
% within groups	(13.6)	(63.6)	(22.7)	(100)
High Count	6	5	3	14
% within groups	(42.9)	(35.7)	(21.4)	(100)
Total Count	28	93	29	150
% within groups	(18.7)	(62)	(19.3)	(100)

Figures in parenthesis represent the percentage value. The Chi-Square value is 12.569 with a degree of freedom 4 at 5% level of significance the P value is 0.014. Therefore it is highly significant and APAT score and Parental coping are directly proportional. An increase in pain score results in the increase of coping score representing that when the child has more pain parent's exhibits more problems associated with coping

PART III

Descriptive Statistics of Various Parameters of Both Groups

Deals with the descriptive statistics of various parameters as pain behaviours, pain score (APAT) of infants and children and coping strategies and coping behaviours of parents of infants and children

Table 36

Percentage of Pain Behaviours shown by Postoperative Infants and Children in Pain

Pain behaviours	Infants %	Children %
Increase in Respiratory rate	100	100
Increase in Respiratory secretions	89.3	94
Increase in Coughing/ gagging	58.7	59.3
Increase in Heart rate	100	100
Increase in Blood pressure	46.7	80.7
Increase in Diaphoresis	100	94.6

(Table continues)

Table 36 (Continued)

Pain behaviours	Infants %	Children %
Increase in Pallor	58	79.4
Increase in Pupil size	58	51.3
Increase in Tearing / lacrimation	100	100
Increase in Rigidity	98.7	100
Increase in Temperature	70.7	81.3
Clenched jaw	-	98.7
Behavioral characteristics		
Changes in Facial expression	100	100
Crying	100	99.8
Difficult to console	98	98.6
Sleep disturbances	98.6	98.6
Touching painful areas	100	100
Vocalization of pain	-	98.7

The major pain characteristics of infants and children with postoperative pain are compared in the table 31 showed certain items are present in both groups.

Table 37

Major Stressful items to Cope as Expressed by Parents of Infants and Children

Stressful items to cope	PARENTS OF Infants %	Children %
Lots of time in caring	84.6	84
Tired in comforting	83.3	53
Disorganization of activities	90	79
Not enough time for self	86.6	83
Worry about other children	84.6	38
Care of others at home	100	83
Complaints of other children about Lack of care	91.3	97
Difficult to console	76.6	55
Child become more demanding	100	95
Distressed with pain behavior	86	100
Dependency on others	92	100
Talk less	63.3	61
Short tempered	98	100
Conscious about personal appearance	98	100
Angry to God	89.3	100
Repeatedly feel bad/ curse yourself	94	100
Spend more time in prayers	86.6	100
New offerings to God	91.3	98
Improvement with pain medication	70	79

(Table continues)

Table 37 (Continued)

Stressful items to cope	PARENTS OF infants %	children %
Clarification with professionals	94	87
Discussion with other parents	85	79
Misunderstanding in the family	79.3	84
Sad to be in the hospital	98	99
Decided to seek help from others	78	46
Spent lot of money	100	99.7
Taken loans	52	98
Used up savings	94	100
Significant drain	98.4	100

Majority of the items expressed have been similar for parents of infants and children.

CHAPTER V

SUMMARY AND DISCUSSION

- SUMMARY
- FINDINGS
- DISCUSSION
- CONCLUSIONS
- IMPLICATIONS
- LIMITATIONS
- RECOMMENDATIONS

SUMMARY AND DISCUSSION

Unrelieved post operative pain in children has many physiological and psychological consequences, which may hamper recovery, leads to postoperative complication and increase the length of hospital stay. Furthermore, many parents experience shock and panic at the disclosure of diagnosis and the need for surgery during which time their behaviours reflect disequilibrium, disorganization and vulnerability. The developmental differences of children related to anatomical, physiological and psychological parameters make their surgical management difficult. Surgeries whether major or minor pose their own threat on the baby. Moreover the pain produced as result of surgery and its repercussions on child's recovery impose additional stress to parents. Quantifying pain to provide adequate intervention and evaluate the effectiveness of such interventions is essential part compassionate medical and nursing practice. Since the experience of pain in children being a distributing event to parents, they exhibit different types of coping behaviours. Quantifying the postoperative pain in children by objective measures along with identifying parental coping towards postoperative pain will enable the medical and nursing practitioners to alleviate pain in children to avoid hazardous effect of pain suffering and promotes better coping in parents.

The present study was conducted to develop an age appropriate postoperative pain assessment tool for infants (0-1 year) and children (2-5 years) and assess parental coping towards postoperative pain in their children.

The objectives of the study were to

- Develop an age appropriate postoperative pain assessment tool (APAT) for postoperative infants (0-1 year) and children (2-5 years).
- Ascertain the quantity of postoperative pain in infants (0-1 year) and children (2-5 years) using age appropriate postoperative pain assessment tool (APAT).
- Identify the most common physiological characteristics (respiratory, cardiovascular and neuromuscular characteristics) manifested by infants (0-1 year) and children (2-5 years) with postoperative pain.
- Identify the most common behavioural characteristics manifested by infants (0-1 year) and children (2-5 years) with postoperative pain.
- Determine the relationship between selected preoperative and postoperative vital signs in infants and children
- Find out the relationship between various infant and child characteristics with respective APAT score.
- Identify the most common coping strategy used by the parents of infants and children with postoperative pain.
- Find out the personality characteristics of parents of infants and children
- Find out the parental coping towards postoperative pain in infants and children using coping questionnaire.
- Determine the relationship between selected demographic variables in parents and parental coping
- Compare between parental coping strategies adopted by parents of infants and children.

- Determine the relationship between parental coping and APAT score of postoperative infants and children
- Identify the relation between various coping behaviours of parents and APAT score of postoperative infants and children
- Compare the APAT score of postoperative infants and children and parental coping towards postoperative pain in both groups of parents.

The hypotheses formulated for the study were as follows

1. There is no significant alteration in preoperative and postoperative vital signs (respiratory rate, heart rate, blood pressure and temperature) of infants
2. There is no relationship between infant characteristics and their postoperative pain score (APAT score) of infants.
3. There is no relationship between parental characteristics and parental coping towards postoperative pain in infants.
4. There is no significant relationship between the pain score (APAT score) and parental coping towards postoperative pain in infants.
5. There is no significant alteration in preoperative and postoperative vital signs (respiratory rate, heart rate, blood pressure and temperature) of children.
6. There is no relationship between child characteristics and their postoperative pain score (APAT score) of infants.
7. There is no relationship between parental characteristics and parental coping towards postoperative pain in children.

8. There is no significant relationship between the pain score (APAT score) and parental coping towards postoperative pain in children.

A conceptual frame work was made by the researcher as Infant- Child Pain Parent Coping Model for the purpose of the study.

A non experimental descriptive approach and a correlational design was chosen for the study.

An age appropriate postoperative pain assessment tool (APAT) was made and validated for infants (0-1 year) and children (2-5 years) separately to quantify pain. A Likert scale for parental coping towards postoperative pain (Coping questionnaire) was developed and validated by the investigator to identify the coping behaviours of parents of infants and children with postoperative pain.

Content validity of the tools was done by experts and CVI was calculated for APAT for infants and children separately. The CVI for APAT for infants and children were found to be 1.00 with 87% of agreement and 95% agreement separately. Construct validity for APAT was done using group contrast method (known group technique). The T test value was >0.6.

The inter rater reliability for APAT was done with Carl Pearson Correlation Coefficient for infants and children with coefficient 0.98 and 0.99 respectively. Content validity of the coping questionnaire was done with 42 items with 100% agreement. The tool was pre-tested. The pilot study was conducted on 2 groups viz twenty five postoperative infants (0-1 year) and twenty five children (2-5 years) and their parents preoperatively and postoperatively as per the set criteria at IMCH,

Calicut during the period 8/8/2001 to 8/9/2001. Results of the pilot study showed that the tool was reliable and the study feasible.

The data collection for the actual study was done at paediatric surgical wards of IMCH, Calicut during 1/12/2001 to 1/8/2002 from the samples as per inclusion criteria after obtaining administrative approval from the authority. Consent was obtained from parents that express their willingness to be the participants of the study.

Findings

The major findings of the study are given in the following sections

Section I

Sample characteristics of infants under study

- Majority of infants (30.6%) were of the age group of 8 months and only 0.66% were under the age of 2 months.
- 58.7% of infants were males
- 50.7% of infants were born to Hindu parents
- 55.3% of infants were second born
- 47.5% of infants had three siblings
- Majority (75.3%) of infants had complete immunization as per age
- 50.7% of infants were born vaginally without assistance
- 89.3% of infants were normal at birth and had no birth complications
- 98.7% of infants had no evidence of jaundice during neonatal period
- 46% of infants had congenital anomalies
- 76.7% of infants were full term babies

- 90.7% of infants had normal birth weight
- 72.7% of the infants were on complementary feeding along with breast feeding
- All infants (100%) had normal sleep pattern
- 85.3% of the infants had normal bowel pattern and 67.3% had normal bladder habits
- Preoperative physical assessment showed that the vital signs fall within normal limits.
- 98.7% of infants had normal respiratory assessment.
- 95.3% had normal cardiovascular functions
- Only 61.3% of infants had problems related to gastrointestinal system, while 33% of infants had genitourinary system complaints. These problems contributed for surgical interventions in these infants.

Postoperative assessment showed that the general status of infants immediately after surgery was satisfactory for all infants.

- 94.7% of infants had major surgeries.
- Majority (41.3%) of infants were restless as far as the level of sedation was concerned
- 89.3% of infants showed protest as reaction towards postoperative pain.

Section II

Details of APAT score of infants

- 81.3%of infants had an increase in respiratory rate of more than 10/minute and 100% of infants have increase more than the preoperative level
- 72% of infants had slight increase in respiratory secretions
- 58.7% had slight increase in cough / gagging
- 53.3% infants had increase in pulse rate more than 15/ minute and 100% of babies had increase more than preoperative level
- 53.7% of infants had increase blood pressure with 46.7% had an increase more than 10 mm Hg.
- 100% of infants had increase in diaphoresis with 80% marked diaphoresis
- 48% of infants had slight pallor and 10% had noticeable circumoral pallor
- 58% of infants had pupils minimally dilated and no one had marked dilatation
- 78% of infants had excessive lacrimation(tearing) and 22% had tears inside the cantus
- 62% of infants had rigidity in extremities and only 1.3% had no rigidity
- 70% of infants had slight increase on temperature and 0.7% had marked increase in temperature. 29.3% were normal
- 86.7% of infants were shown to have facial grimace and 13.3%distorted face. No one had normal composed face.
- 65.3% of infants cried continuously while 34.7% had moaning cry.
- As far as Consolability is concerned 74% of infants were reasonable and 24% were seemed to be difficult to console.
- 85.3% of infants had drowsiness and had sleep disturbances.

- Only 20% of parents of infants made timely request for pain medication while 36% made occasional request and majority (44%) had made no request for pain medication.
- 63.3% of infants had no pain medication.
- 36.7% had PRN medications

The analysis of data on preoperative and postoperative vital signs showed that there is significant alteration in vital signs in infants with postoperative pain. Hence the hypothesis H_0 1 was rejected.

Section III

Relation between APAT score and selected characteristics of infant (0-1 year)

Demographic variables

- Chi square test of significance showed association between APAT Score and selected demographic variables such as birth order (P= 0.035), condition at birth (P=0.000), birth complications (P=0.000), nutrition (P=0.000), reaction towards postoperative pain (P=0.000).
- Analysis of data showed that there was no significance between APAT score and the following variable.

Sex (P=0.359), religion(P=0.218), No. of sibs (P=0.191), immunization (P=0.823) and system disorders like gastrointestinal (P=0.844), cardiovascular(P=0.833), respiratory (P=.474) and genitourinary disorders (P=0.833), type of delivery (P=0.991), birth injuries(P=0.436), presence of jaundice(P=0.459),

congenital anomalies(P=0.333), gestational age(P=0.417), nutrition, sleep and bowel elimination (P=.297 for these) and bladder elimination (p=0.207).

Hence the hypothesis $H_0$2 that there is no relation between the infant characteristics and APAT score is partially accepted for those items which are not significant and rejected for those items which are significant.

Section IV

Sample characteristics of parents of infants

- Majority (61.3%) of parents of infants were reasonable in personality characteristics
- 51.3% parents had joint family
- 93.3% of parents were married
- 84.7% of mothers got married before 20 years and 70% of fathers got married before 30 years.
- 97.3% of parents had good quality of married life
- Majority (46.7%) of mothers participated was of age between 24-29 years
- 70% of parents were urban dwellers
- Majority (27.3%) had middle school education and 26% had education up to degree level
- 55.7% had income below Rs1000/- and 44.3% had income above Rs3000/-

Section V

Deals with coping strategies and personality characteristics of parents of infants

- 51.3% of parents very often verbalize and seek help from others.

- 49.3% used seeking spiritual support and no one used being humorous as a coping strategy.
- 61.3% of parents were reasonable according to personality characteristics

Section VI

Assessment of coping behaviour of parents of infants with postoperative pain

- 21.3% of parents had low score indicating that they have not much difficulty in coping with postoperative pain of their infants
- 63.3% of parents had medium score for coping depicting coping difficulty and 15.3% had high score showing that these parents faced much difficulty in coping.
- Majority(84.6%)parents felt a moderate amount of caring stress and coping
- 84.6% of parents felt that they could not provide adequate care of others at home and expressed that 40.7% of other children at home complain about the same.
- Only 15.3% of spouses had strong complaints about neglect of their care
- All parents expressed very high feeling that their sick infants are taxing and demanding
- 86% of parents felt high degree of distress with pain behaviours of their children
- 92% of parents showed high degree of dependence on others.
- All parents expressed financial stress as a major coping difficulty.

Analysis of data on relationship between parental coping and their characteristics showed that there existed relationship between certain parental characteristics and parental coping (personality P=0.037, age-P= 0.008, education-P=0.000, main occupation-P=0.000, monthly income-P=0.006,type of family-0.027, age of marriage (mother)- P=0.002 and quality of married life-P=0.003). The hypothesis $H_0$3 that there is no relation between parental characteristics and parental coping was rejected.

Section VII

Relationship between APAT Score and parental coping of postoperative infants.

From the data analysed it was shown that in all the scores (low, medium and high) the percentage was higher. The Pearson Chi Square value was 31.511 with degree of freedom 4 with the P value = 0.000. Hence the hypothesis H04 was rejected as there was significant relation between the APAT score and parental coping.

Section VIII

Sample characteristics of children (2-5 years)

- 56% of children were under the age group of 5 years.
- 73.3% were males.
- 50% of parents of children were Hindus
- 66.7% were first born children and 68% of children had one sibling.
- 50% of children had gastrointestinal problems, 40% had genitourinary problems and other 10% constituted all other systems disorders.

Data on birth history showed that

- 75.3% of children were born vaginally.
- 16.7% had abnormality present at birth.
- 15.3% had birth complications
- 62.7% had some type of congenital anomalies.2% of children were small for date at birth and 4% were low birth weight babies. 100% of children were on normal diet.

Data on postoperative assessment showed that

- 87.3% of children had satisfactory condition immediately after surgery.
- 96% had major surgery.
- 56.7% of children were restless as per Doherty's level of sedation scale.
- 70.7% showed protest as reaction towards postoperative pain.

Section IX

Deals with Pain behaviours of children

- 88% of children showed an increase in respiratory rate more than 10/ minute
- 85% had slight increase on respiratory secretions
- 59.3% children had slight increase in cough.
- 100% of children had increase in pulse rate
- 64% had increase in blood pressure
- 63% of children had marked increase in diaphoresis
- 68.7% had slight pallor.
- 51.3% had minimal dilatation of the pupils.

- 100% children manifested lacrimation (tearing) with 60.7% had excessive lacrimation.
- All children had rigidity with 51.3% rigidity in extremities.
- 78% of children had slight increase in temperature.
- 98.7% children had occasional clenching.
- There were changes in facial expression for all children under study
- 76% of them had facial grimace
- 62.7% were moaning.
- 47.3% were crying continuously
- 75.3% were reassurable
- 89.3% were drowsy at times and 9.3% of children were awake and crying
- 83.3% of children were guarding the postoperative site
- 94% vocalized pain
- 6% of children were screaming with pain
- 72% of parents of children made occasional request for pain medication
- 72% of children were given PRN pain medications

As far as the classification of children based on pain medication showed that73.3% of children had medium score on APAT score indicating suffering with pain.

Section X

Deals with relationship between APAT score and child characteristics

Data analysed showed that there was significant alteration in preoperative and postoperative vital signs for children with postoperative pain (respiratory rate-P=0.000, pulse rate-P=0.000, B.P-P=0.000, and temperature- P=0.000). Hence the hypothesis $H_0$5 that there is no significance between preoperative and postoperative vital signs of children with postoperative pain is rejected.

As far as the relation between child characteristics and APAT score, only two factors are found to be significant (condition at birth- P=0.021, reaction of the child to postoperative pain- P=0.040) and hence H05 is rejected for those factors and accepted for other factors.

Section XI

Deals with parental characteristics of children with postoperative pain

Analysis of data on parental characteristics showed that

- 53.3% had three generation families.
- 96.7%were married and 82% of mothers were married before the age of 20 years.
- 64.7% of fathers got married after 25 and before 30 years
- majority of parents participated in the study (33.3%) were at the age of 30-34 years
- 56% of parents were living in urban areas
- 27.3% had middle school education and 2% had more than postgraduate education.

- 65.3% of parents were unemployed and 2% were professionals and 22% got government jobs.
- 86% had income Rs1000/- as per hospital records.
- 98% had expressed to have good married life

Section XII

Deals with parental coping strategies and coping towards postoperative pain in their children.

- 50% of parents verbalize and sought help from others very often.
- 52% of parents showed avoidance and withdrawal as a coping strategy
- 83.3% of parents never engaged in any demanding activities.
- 58.7% were never attempted to develop social support
- 59.3% of parents used crying and shouting as a coping strategy rarely.
- None of the coping strategies were used as an often or very often item
- 40.7% of parents used seeking spiritual support often as a coping strategy
- None of the parents used being humorous as a coping strategy
- Majority of parents (70%) had some sort of support
- 4% had no support at all

Classification of parents based on coping showed that 18.7% had low score, 62% had moderate score and 19.3% had very high score showing coping difficulties.

The findings showed that there were relationship between coping strategies and coping behaviours like extra input care(P=0.006), pain induced emotional stress and coping(P=0.018), social stress and coping(P=0.018) and financial stress and coping

(P=0.009). Hence it was concluded that there existed relation between coping strategies used by parents and their parental coping behaviours and $H_0$6 was rejected.

Analysis of data showed that there existed a relation between parental characteristics like occupation (P=0.006), age of mother at marriage (P=0.041) and age of marriage of father (P=0.025) and their coping towards postoperative pain in their children. Hence the hypothesis $H_0$7 was rejected.

Section XIII

Deals with relation between APAT score and parental coping of postoperative children with pain

- Chi square test of significance showed a very high significant score between APAT and parental coping (P=0.014).

An increase in APAT score increases the coping score depicting that when there is increased postoperative pain in children, the parents find it difficult to cope. Analysis of data showed that the majority of pain behaviours of infants and children and the coping strategies, personality characteristics and coping behaviours of parents in both groups were same.

Discussion

The findings of the present study are discussed in relation to the findings of other studies and discussed under following heads

- Infant and child characteristics
- Pain characteristics/ behaviours of infants and children
- Pain assessment/ quantification of infants and children

- Parental characteristics and coping towards postoperative pain in children

Infant and child characteristics

Some literature acknowledges that all children are capable of experiencing pain (Mc Grath, 1941; Izard, 1982; Anand &Hickey, 1987; Mather & Mackie.1983; Owen, 1984; Yaster & Deshpande, 1988). But children's ability to express pain is influenced by factors such as age, developmental stage, sex, culture, prior experiences and anxiety (Adams, 1989). This being the fact, concerning the above said variable, in the present study, it was found that such factors have no significance with the amount of postoperative pain in infants and children. However factors such as condition at birth, birth complications, birth order and nutrition (P=0.000, P=0.000, P=0.035, P=0.000 respectively) for infants have significant association with APAT score, while only condition at birth (P=0.021) had significant association with APAT score for children 2-5 years. This may be an indication of previous experience of immunization and had no significance with APAT score for infants and children.

Gender studies found no significant relationship between pain and psychological distress scores (Davitz &Davitz, 1981; Oberst, 1978; Pendelton, 1969) and supports the findings of the present study. Bond (1981) found that nurses in radiotherapy units initiated more analgesics injections in women and refused more analgesic request from the male patients. A difference in analgesic administration in relation to gender was also identified by Cohen (1999) who found that nurses selected less medication for pain for female patients than males. These two studies show that nurses had some notion of gender as a factor deciding pain. Nurses rated children of

4-12 years as less psychologically disturbed than patients of older age groups (Davitz& Davitz, 1981). These findings are not in support of the findings of the present study. But Taylor et al (1984) found patient's age did not have any influence on pain and this support the findings of the present study.

Choiniere et al (1990) assessed the relation between pain and factors like age and found no significance in nurse's assessment. This too supports the findings of the present study.

Sutters & Miaskowski (1997) in their study on inadequate management of pain after tonsillectomy in children found that past history of hospitalization or previous surgery did not influence the reported behavioural changes. This support the findings of the present study as the previous experience of immunization has not influenced the pain score (APAT) of infants and children.

Pain behaviours/ characteristics of infants and children

To date, only a limited number of studies have evaluated the postoperative pain experiences of children after surgery. Sutters and Miaskowski (1997) had found that majority of children after tonsillectomy experienced restless sleep (62%), behavioural changes (75%) and correlated to under treatment of pain (P=0.004). These findings support the findings of the present study showing that 85.3% infants and 89.3% of children had restlessness and sleep disturbances. All these babies had normal sleeping pattern before surgery. 41.3% of infants and 52% of children were restless after surgery as far as level of sedation was concerned.

A study to identify the physiological and behavioural indicators used by NICU nurses to interpret infant pain found that 50% nurses used ten pain indicators in decreasing order of frequency as fussiness, restlessness, grimacing, crying, increased heart rate, increased respiratory rate, wiggling, rapid state changes, wrinkling of forehead and clenching of fist. These findings are supported by the findings of the present study with indicators as restlessness, crying increased heart rate, respiratory rate and wrinkling of the forehead. The present study findings showed that all infants with postoperative pain had physiological changes as increase in respiratory rate, and heart rate, behavioural changes as tearing, crying, facial changes especially on touching painful area and diaphoresis. Majority of infants and children in this study exhibited sleep disturbances, inconsolability and temperature changes. These findings support the nurse's assessment of pain indicators. Princess Margaret Hospital Pain Assessment Tool (PMHPAT) developed to raise the awareness of the nursing staff to the presence of acute pain in children perceived the need to include pulse assessment in the tool that support the findings of the present study. APAT observation showed that all infants and children had increase in pulse rate with postoperative pain (P=0.000 & P=0.012 respectively).

Coffman et al (1997) found that nurses selected vital signs as the most frequent physiological indicators of pain followed by behaviours such as crying and irritability. The present study showed that behavioural characteristics such as facial expression, rigidity and crying are the most common indicators followed by increase in vital signs.

Gadish et al (1992) found that vital signs were ranked as primary indicators of pain affecting nurse's decision to medicate for pain. The present study, though, revealed that alterations of vital signs do happen with pain, but were not ranked as the primary indicators of pain. The primary indicators of pain were the non verbal behaviours such as facial expression, facial grimacing and touching painful area and rigidity of various degrees. Hence it was concluded that a child's behavioural changes along with changes in vital signs seems to be the more reliable indicators of postoperative pain.

Olson and Downey, (1998) studied the physiological responses to noxious stimuli of circumcision with anesthesia and analgesia and found that infants demonstrated physiological behaviours in responses to pain which are observable and measurable in terms of changes in blood pressure, heart rate and oxygen saturation and is consistent with the findings of the present study.

Behavioural measures have been used for the assessment of pain both in the clinical as well as in the research setting, and behavioural cues remain the primary indicators of pain in children who are unable to respond to pain or to follow instructions in the use of assessment tools. These findings support the findings of the present study. McRae, Routke, Imperial-Perez, Eisenring and Ueda (1997) reported good correlation among CHEOPS, FACES Scale, OUCHER and FLACC suggesting that the tools were measuring similar phenomena. The present data using APAT provides additional support for the use of behavioural observations in quantifying pain in young children. It was also mentioned that behavioural observations may

catch other changes unrelated to pain and hence self report scales may be used along with behavioural observations in older children (Eland, 1985).

Pain Assessment Tools of Infants and Children

Bozzette (1993) described 3 components of the pain experience as physiologic component relating to neuroendocrine and sympathetic responses to nociceptive activity, psychological component or emotional reaction and experiential component attributing meaning to the experience used by nurses to assess pain in verbal children. In non verbal children, assessment is done by assessing physiologic and experiential component. In the present study too the investigator utilized these three components for non verbal and verbal children.

Pain assessment tools that were previously reported as being reliable and valid were not used in our clinical situation as they are usually made and used for western children. Furthermore, the length of the tool and confusing scoring system of these scales makes their use inappropriate for our scenario. The present tool was prepared by selecting behaviours described and validated in different tools of western origin (CHEOPS, FLACC, TPPPSS, Buttner/ Finke) inculcating appropriate modification. The CHEOPS is used for children between 1 and 4 years of age, and requires scoring of six categories – cry, facial expression, verbal expression, torso movement, touching of the wound and leg movement(McGrath et al, 1985)

The OPS tool is similar to the CHEOPS but contains only four categories with documentation of a percentage change in blood pressure from baseline. Validity of this scale was established in children aged 13-18 years.

TPPPSS is a tool that requires scoring in 3 general categories: vocal pain expression, facial pain expression, and body expression.

Buttner and Finke tool also used facial expression, leg position, and position of torso, motoric restlessness, cry and Consolability.

FLACC includes the categories of crying, facial expression, position of trunks, leg position, motoric restlessness and Consolability.

The APAT used in the present study used all major physiological and behavioural categories used by all these scales making it valid in comparison with other scales in Indian scenario.

In addition to the high correlation between scores of two raters (0.98 and 0.99) the inter rater agreement for the APAT is similar to the agreement reported for the CHEOPS (range 61-100%- Mc Grath, 1985). Alpha values of APAT observations indicate acceptable agreement and are very similar to those reported for FLACC (range 0.53-0.78). The reproducibility and consistency of scores demonstrated in the present study provide confidence about data collected using APAT.

The construct validity of APAT as a measure of pain was supported by the significant reduction in scores after analgesics administration. Similar reductions in pain scores after analgesics were found with FLACC, CHEOPS and TPPPSS (Tarbelt et al, 1992)

This study of APAT contributes to overall evaluation of pain measurement in infants and children who can not report pain. The study results confirm inter rater reliability.

Preliminary validity of APAT as a tool to assess pain in children provides a simple framework for quantifying pain with physiological and behavioural observations both for clinical setting and research. APAT is easy to use and can incorporate in to documentation of pain in children. Utilization of APAT to assist assessment and documentation of pain may facilitate treatment and improve patient outcomes.

Parental Characteristics and Coping

Mc Croy (1991) and Wink (1993) identified the importance of the family input as an indicator of pain as parents can often recognize subtle highly significant changes. In the present study parental input is considered and is found to be significant to factors such as age at marriage, personality changes of parents and their coping supporting the findings of Mc Croy and Wink. In responses to variety of stressors to hospitalization, young children display a multitude of uncharacteristic behaviours that are major sources of stress for parents (Curely and Wallace, 1992; Johnson, Nelson and Brunquell, 1988; Knaff, Cavallar and Dixon, 1988; Vulcan, 1984). These findings support the findings of the present study since 86.6% of parents found that disturbed behaviour of infants and children with pain is highly stressful to cope.

Kruger (1992) identified that when children are hospitalized many parents experience shock and panic and they exhibits behavioural disequilibrium, disorganization, vulnerability and psychosomatic symptoms. Todres et al, (1994) identified denial, anger, protest, guilt, sadness and mourning as initial reactions to

hospitalization of children with serious illness. These findings too support the findings of the present study though it is related to postoperative pain in infants and children. In the present study, parents find it difficult to cope with disturbed behaviour of children with pain; pain induced emotional stress and disorganization of the family. They expressed that they are sad to be in hospital too. Present study revealed that the parents felt helpless and inadequate to relieve the sufferings of their kids that contributed to coping difficulty. These findings were consistent with findings of Hanson, Johnson, Jepson, Thomas and Hall, 1994 and Kruger.1992.

Findings showed that parents lost their temper for trivial things that corresponds to the findings of Todres, Earie and Jellinek, (1994) where they found that exhaustion and uncertainness precipitating irritability and depression. The findings of this study revealed that other major sources of stressors to cope include behaviours of the child with pain and their emotional responses and loss of parenting role. These findings are supported by the findings of Curley and Wallace, 1992; Eberly, Miles, Carter, Hennessey and Riddle, 1985; La Montage and Pawlak, 1990; Miles and Carter, 1982; Miles, Carter, Spincher and Hassanein, (1984).

Parents also expressed that they do not know how they can help their child to relieve pain and they feel inadequate to minimize their children's pain and not being able to protect them from pain. These findings are consistent with the findings of Miles and Carter, (1982) and La Montage and Pawlak, (1990).

Implications to Nursing

Effective management of pain decreases suffering and may speed up recovery after surgery and shorten hospital stay. Children's pain experiences have long been of concern to nurses, who assume primary responsibility for assessing and managing children's pain when they are hospitalized. Systematic pain assessment should become part of the postoperative routine as measuring other physiological variables. The nurse must become familiar with the physiological changes and behavioural observations that may indicate pain in infants and children. A silent apparently quiescent infant manifest a pain face, be tense and be hard to comfort, need to be assessed for pain.

On the basis of the findings of the study, the investigator proposes the use of a common tool for assessing pain in children from 0-5 years. This tool was prepared using pain characteristics that had been manifested in more than 90% of infants and children with postoperative pain. Since it contains only 10 items and the scoring is simple, can be incorporated along with any postoperative assessment format. Pain assessment may be included as the 5^{th} vital sign along with other vital signs. This tool contains the portion of major vital signs; the assessment of other parts will not take much time from the part of nurse's routines. Recommended pain assessment tool for routine pain assessment is given below.

Table 38

Recommended APAT for Children

Sl.No.	Criteria	Score		
		0	1	2
1	Respiratory rate	Normal	>5/ minute	>10/ minute
2	Respiratory secretion	Normal	Slight increase	Marked increase
3	Pulse rate	Normal	>10/ minute	>15/ minute
4	Temperature	Normal	>1-2^0 C	>2^{0}C
5	Diaphoresis	No increase	Minimal increase	Marked increase
6	Lacrimation/tearing/cry	No tearing/no cry	Tearing inside the cantus /moaning	Tears come out/ crying continuously
7	Rigidity	No rigidity	Rigidity in extremities	Whole body rigidity
8	Facial expression	Face composed	Face distorted	Facial grimace
9	Sleep disturbances	Normal sleep	Wake up easily	Not able to sleep
10	Touching painful area / pulling the site	No touching / no pulling	Touching / pulling	Guarding and crying when approached
	Total score	0	10	20

Maximum score will be 20.

This tool can be used for any children with postoperative pain. But self report or vocalization about pain can be included for older children who can verbalize their pain.

For better pain management in children parent's awareness to pain relief need to be emphasized. Only 72% of parents made occasional request for pain relief though they expressed very high score of stress to cope in seeing their children in pain and discomfort. Since parents can identify subtle changes in their children they can be very well relied on the report of pain behaviours. Making parent cognizant about pain relief and the added advantage of the same may be considered as a professional responsibility by nurses. Professionals need to consider their paediatric patient and parents of them as a single unit. Anything that affects one will certainly affect the other. Pain relief as the literature had shown speed up recovery and there by decrease hospital stay. It also alleviates the sufferings of both the paediatric patients and their parents. Hence it is imperative that the professionals should assess postoperative pain and not to be hesitant to provide adequate pain relief to their paediatric patients to reduce the emotional turmoil of the parents of these vulnerable children.

Nursing Education

Though pain assessment and ways to promote coping to different difficult situation are taught as a part of nursing education curriculum, adequate emphasis in practice is not given in our country. The findings of the study warns nurse educators to prepare future nurses more sensitive to pain behaviours and the coping

difficulties that the parents encounter so that these nurses will be able to use professional nursing skills to impart quality care to their clients in relieving pain and can promote parental coping. Furthermore the present day practicing nurses need to be made aware by giving them in-service education on pain assessment and pain management.

Nurse administrators are the key people in setting up nursing care standards to provide quality care to clients. Relieving pain is one of the core aspects of quality care. Hence the standards related to relieving pain as a part of professional practice may be inculcated in the standards of care with norms referenced criteria. They can organize in service education to make their nurses reactionaries to unrelieved pain and its harmful effects. Its important to develop a 'pain conscience' when caring for clients, the nurses need to learn to assess for pain in each client, select proper pain therapies and evaluate the effects of such actions in relieving pain.

Nursing Research

The present study opens avenues for further research in our scenario. Pain of different types, with different types of procedures, how children cope with pain, copying styles of children with pain, reaction of parents and sibs etc need to be explored.

Limitations of the Study

- Purposive sampling was used with no randomization making the generalizability of the study limited.

- Both parents of the child could not be included and hence comparison of coping could not be done.

Recommendations

- Similar type of study can be done in other type of pain experience like cancer pain, pain related to procedures etc.
- A comparative study of coping of both parents can be done
- Children's copying styles and coping behaviour can be assessed
- The developed tool can be tested and validated with other internationally accepted tools in different settings.

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APPENDIX A

AGE APPROPRIATE PAIN ASSESSMENT TOOL

Section I

A. Demographic data

1. ID NO:
2 Age/DOB
    1. 0-1
    2. 2-5 years
3. Sex
    1. male
    2. female
4. Religion
    1. Hindu
    2. Muslim
    3. christan
5. Order of birth
    1. first
    2.second
    3. third
    4. fourth
    5. others
6. Number of sibs
    1.nil
    2. one
    3. two
    4. three
    5. others
7. Immunizations
    1. complete
    2. incomplete
    3. not immunized
8. Chief complaints/ preoperative diagnosis in system
    1. gastrointestinal system
    2. cardiovascular system
    3. respiratory system
    4. genitor urinary system
    5. others

B. Birth history

1. Type of delivery
    1. vaginal delivery
    2. assisted vaginal
    3. caesarean section

2. Condition at birth
    1. NAD
    2. abnormality detected if any
3. Birth injuries/ complications
    1. NAD
    2. abnormality detected if any
4. Presence of jaundice
    1. NAD
    2. abnormality if any
5. Congenital anomalies
    1. NAD
    2. abnormality if any
6. Gestational age at birth
    1. FTND
    2. pre term
7. Weight at birth
    1. normal
    2. SFD
    3. LBW
    4. LGA
    5. Others
8. Present weight
    1. normal for age
    2. less for age
    3. more for age
9. Nutrition
    1. breast feeding
    2. formula feeding
    3. complementary feeding
    4. normal diet
    5. others if any
10. Sleep pattern
    1. normal
    2. abnormal
11. Elimination pattern

Bowel

1. normal
2. abnormal

Bladder

1. normal
2. abnormal

Section II

General assessment

SYSTEM PARAMETERS	NORMAL	ABNORMAL
General appearance		
Height		
Head circumference		
Blood pressure		
Respiration		
Pulse/ heart rate		
Temperature		
Level of hydration		
Head/ nose/ ears/ throat		
Endocrine system		
Respiratory system		
Cardiovascular system		
Haematological system		
Lymph nodes		
Gastrointestinal system		
Genitourinary system		
Neurological system		

Section III
Postoperative assessment
1. General status

1. satisfactory
2. unsatisfactory

2. Type of surgery

1. major
2. minor

3. Level of sedation (sedation scale Doherty 1991)

- No response to loud, & verbal stimuli 0
- Asleep, sluggish response to verbal stimuli 1
- Asleep brisk response to verbal stimuli 2
- Awake and calm 3
- Restless 4
- Anxious, agitated 5

4 .Elicit Pain history

1 Words the child uses to describe pain

1.Vedana/
2. vavu
3. navu
4. uvvu
5. anyothers

2. Reaction of the child towards hospitalisation and surgery:

1.protest
2.denial
3. despair
4.withdrawal

4.3 Age appropriate pre-operative preparation provided:

1.yes
2. no

Section IV

5. AGE APPROPRIATE PAIN ASSESSMENT TOOL- 0-1 YEAR.

Sl.No	CHARACTERISTICS	0	1	2
1.	**Respiratory characteristics**			
1	Respiratory rate	Normal	I 5-10/mt	I10/mt
2	Respiratory secretions	Normal	Slight increase	Drooling
3	Coughing/ gagging	No cough/gag	Slight increase	Hiccough
2	**Cardiovascular characteristics**			
	Heart rate			
1	Blood pressure	Normal	I 5-15/mt	I 15/mt
2	Diaphoresis	Normal	I 5-10/mt	I 15/mt
3		Not present	Increased	Markedly increased
	Pallor			Noticeable circum-oral
4		No pallor	Slight pallor	pallor
3	**Neuromuscular symptoms**			
	Pupil size			
1	Tearing	Normal	Dilated minimally	Dilated markedly
2		No tearing	Tears inside the canthus	Excessive tearing
	Rigidity		Rigidity in extremities	
3		No rigidity	Slight increase	Whole body rigidity
	Temperature			Marked increase
4		Normal		
4	**Behavioural characteristics**			
	Facial expression			
1	Crying	Face calm posed	Face distorted	Facial grimace
2	Consol ability	No cry	Moaning	Crying continuously
3		Content and relaxed		Difficult to console
			Reassurable	Awake and crying
	Sleep	Active sleep		Pulling the site/guarding
4	Touching painful area	Not touching	Drowsiness	
5			Touching	
5	**Miscellaneous**			
1	Parents request for medication	No request	Occasional request	Timely request
	Pain medication		SOS	
2		No medication		Scheduled
	Total score			

MAXIMUM SCORE OBTAINED:

Section V

1. AGE APPROPRIATE PAIN ASSESSMENT TOOL- 2-5 YEARS.

Sl. No.	CHARACTERISTICS	0	1	2
1	**Respiratory characteristics**			
	Respiratory rate			
1	Respiratory secretions	Normal	I 5-10/mt	I10/mt
2	Coughing/ gagging	Normal	Slight increase	Drooling
3		No cough/gag	Slight increase	hiccough
2	**Cardiovascular characteristics**			
1	Heart rate	Normal	I 5-15/mt	I 15/mt
2	Blood pressure	Normal	I 5-10/mt	I 15/mt
3	Diaphoresis	Not present	Increased	Markedly increased
4	Pallor	No pallor	Slight pallor	Noticeable circum-oral pallor
3	**Neuromuscular symptoms**			
	Pupil size			
1	Tearing	Normal	Dilated minimally	Dilated markedly
2		No tearing	Tears inside the canthus	Excessive tearing
	Rigidity			
3		No rigidity	Rigidity in extremities	Whole body rigidity
	Temperature			Marked increase
4	Clenched jaw	Normal	Slight increase	Clenching jaw &
5		Normal position	Occasional clenching	wrinkling fore head
4	**Behavioural characteristics**			
	Facial expression			
1	Crying	Face calm posed	Face distorted	Facial grimace
2	Consolability	No cry	Moaning	Crying continuously
3		Content and relaxed	Reassurable	Difficult to console Awake and crying
	Sleep			Pulling the
4	Touching painful area	Active sleep	Drowsiness	site/guarding
5		Not touching	Touching	Screaming with pain
	Vocalization of pain			
6		Normal conversation	Complaining of pain	
5	**Miscellaneous**			
1	Parents request for medication	No request	Occasional request	Timely request
	Patient's request		Occasional request	
2		No request	Sos	Timely request
	Pain medication			
3		No medication		Scheduled
	Total score			

Section VI

Coping strategies used by parents of infants and children with postoperative

Observation parameters	**0**	**1**	**2**	**3**	**4**
Verbalise and seek help from others					
Avoidance and withdrawal					
Seeking diversions					
Engage in demanding activities					
Developing social support					
Crying and shouting					
Irritated and agitated					
Seeking spiritual support					
Being humorous					
Seeking support from close relatives					
Support system available					

pain

12.Personality characteristics;

1. 1.anxious
2. nervous
3. calm and cool
4. demanding
5. 5.agitated
6. 6.reasonable

Section VII

INTRODUCTION:

I am investigating the parental coping towards postoperative pain in children. I shall ask a few questions. Please be kind enough to give me proper information. The information given will be kept confidential. Please do not hesitate to ask doubts if anything are not clear.

Part 1. SOCIAL & DEMOGRAPHIC DATA

1.AGE

2.BACKGROUND
1. Urban
2.rural
3.semiurban

3.EDUCATION
1.Nil
2.pre primary
3.middle
4.secondary
5.pre-university
6.degree
7.postgraduate
8.anyothers

4. MAIN OCCUPATION
1.land owner
2.agriculture
3.business
4.profession
5.service
6.others

5.MONTHLY INCOME
1.Less than Rs 1000/-
2.1001-2000/-
3.2001-3000/-
4.3001-above

6.FAMILY
1. Joint
2.nuclear

7.MARITAL STATUS
1.Married
2.remarried
3.single
4.divorced

8.AGE OF MARRIAGE
MOTHER
1.before 18 years
2.before 20

3.before 25
3.before 30
FATHER
1.BEFORE 20
2.before 25
3.before 30

4. Others
5. QUALITY OF MARITAL LIFE 1.GOOD
2.very good
3.bad

COPING QUESTIONNARIE

This is a structured interview schedule to systematically elicit the coping behaviour of parents towards post-operative pain in children.

The theoretical basis on which the instrument is designed largely corresponds to stress and coping put forward by Folkman and Lazarus. This instrument has developed with four areas with sub-scale as

1. Caring stress and coping- a. extra input of care
b. neglect of other's care in the family
c.Disturbed behaviour of the child

1. pain induced emotional stress and coping- a. personal distress
b. Pain distress
c. Knowledge deficit distress
d. Marital problems

2. Social stress and coping a. altered social life
b. Interpersonal problems

3. Financial stress and coping a. financial implications.

Sl no	Caring stress and coping	Nil 0	Low 1	Mod erate 2	High 3	Very high 4
A	Extra input of care and coping					
1	Do you spend a lot of time in caring your child					
2	Do you feel tired in comforting your child					
3	Do you feel that there is disorganisation in your activities					
4	Do you work more than usual					

5	Do you feel that you do not have enough time for yourself					
B	Neglect of others in the family and coping					
1	Do you feel worried about other children at home					
2	Do you feel that you are not giving adequate care to others at home					
3	Does your other children complain and say that their needs are not fulfilled					
4	Does your spouse complain about your neglect					
C	Disturbed behaviour of the child and coping					
1	Does your child cry often which you can't console					
2	Do you feel that your child is more demanding and taxing					
3	Do you get distressed with your child's behaviour in pain					
11	Pain induced emotional stress and coping					
A	Personal distress and coping					
1	Do you feel dependent on others					
2	Do you talk less than normal					
3	Do you talk more than usual					
4	Do you become short tempered					
5	Do you feel more conscious about personal appearance					
6	Do you feel angry/ resentful to God for your child's pain/ condition					
B	Pain distress/ emotion focussed distress and coping					
1	Do you repeatedly feel bad or curse yourself for your child's pain / suffering					
2	Do you spend more time in prayers					
3	Do you visit places of worship more frequently					
4	Are there any plan for new offerings to God at present					
5	Do you spend more time in seeing T.V, listening music etc.					
C	Knowledge deficit distress and coping					
1	Do you think that your child's condition will be improved with pain medication					

2	Do you request for pain medication					
3	Do you try to collect as much information about your child's operation and pain					
4	Have you try to clarify from doctors and nurses about your child's condition					
5	Have you try to discuss your child's sufferings to other parents of children with same condition					
D	Marital problems					
1	Does your spouse help you in looking after the child at hospital					
2	Does your spouse blame you for child's hospitalization					
3	Do you fight over even trivial things regarding the care of your child					
4	Has there any misunderstanding between you and your husband about your child					
111	Social stress and coping					
A	Altered social life and coping					
1	Do you feel sad to be in the hospital with your child and not able to attend social events at your place					
2	Have decided to seek help from your relatives/ friends					
3	Have you approached your relatives/ friends for help/ support					
4	Have you discussed the treatment plan of your child with your relatives					
5	Have you approached any social support system for help					
B	Interpersonal problem and coping					
1	Has any misunderstanding occurred in the family about the care of your child at hospital					
IV	Financial stress and coping					
1	Have you spent a lot of money on your child's treatment					
2	Have you taken any loans					
3	Have you used up any savings for treatment of your child					
4	Do you feel that because of this operation and treatment, there has been a significant drain family financial resource?					

APPENDIX B

ഭാഗം - 1

പ്രാഥമിക അന്വേഷണം

ക്രമനമ്പർ :

പേര് :

നിർദ്ദേശം : കുട്ടിയുടെ ഓപ്പറേഷനോടനുബന്ധിച്ച് ഉണ്ടാകുന്ന വേദന, മാതാപിതാക്കൾ എങ്ങനെ അഭിമുഖീകരിക്കുന്നുവെന്ന് അറിയുവാൻവേണ്ടി നടത്തുന്ന പഠനത്തിന്റെ ഭാഗമായി നിങ്ങളോട് ചോദ്യങ്ങൾ ചോദിക്കുന്നതാണ്. ദയവായി ശരിയുത്തരം നൽകുക. നിങ്ങൾ നൽകുന്ന വിവരങ്ങൾ രഹസ്യമായി സൂക്ഷിക്കുന്നതാണ്. നിങ്ങൾക്ക് എന്തെങ്കിലും സംശയമുണ്ടെങ്കിൽ അത് ചോദിക്കാൻ മടിക്കേണ്ട.

വിഭാഗം - 1

സാമൂഹിക ആനുകാലിക പശ്ചാത്തലം

1. വയസ്സ് :

2. താമസിക്കുന്ന സ്ഥലം :
   1. നഗരം
   2. ഗ്രാമം
   3. പ്രാന്തപ്രദേശം

3. വിദ്യാഭ്യാസം :
   1. നിരക്ഷരൻ
   2. എഴുതുവാനും വായിക്കാനും മനസ്സിലാക്കാനുമുള്ള കഴിവ്
   3. 7-ാം തരം
   4. എസ്.എസ്.എൽ.സി.
   5. പ്രീഡിഗ്രി
   6. ഡിഗ്രി
   7. ബിരുദാനന്തര ബിരുദം
   8. മറ്റുള്ളവ

4. ജോലി :
   1. ഭൂവുടമ
   2. കൃഷിക്കാരൻ
   3. വ്യവസായി
   4. പ്രൊഫഷണൽ
   5. സേവനം
   6. മറ്റുള്ളവ

5. മാസവരുമാനം :
   1. 1000 രൂപ വരെ
   2. 1000-2000 രൂപവരെ
   3. 2000-3000 രൂപവരെ
   4. 3000 രൂപയിൽ കൂടുതൽ

6. കുടുംബം : 1. അണുകുടുംബം

7. വൈവാഹികം :
   1. വിവാഹിതൻ
   2. പുനർവിവാഹിതൻ
   3. ഒറ്റയ്ക്കുള്ളവർ
   4. വിവാഹം വേർപെടുത്തിയവർ

8. വിവാഹം കഴിച്ച വയസ്സ്

   മാതാവ് :
   1. 18 വയസ്സിനു താഴെ
   2. 20 വയസ്സിന് താഴെ
   3. 25 വയസ്സിന് താഴെ
   4. 30 വയസ്സിന് താഴെ
   5. മറ്റുള്ളവർ

   പിതാവ് :
   1. 20 വയസ്സിനു താഴെ
   2. 25 വയസ്സിനു താഴെ
   3. 30 വയസ്സിനു താഴെ
   4. മറ്റുള്ളവർ

പ്രശ്നാഭിമുഖീകരണ ചോദ്യാവലി

ഓപ്പറേഷനുശേഷം കുട്ടികൾക്കുണ്ടാകുന്ന വേദനയോട് മാതാപിതാക്കൾ എങ്ങനെ പ്രതികരിക്കുന്നുവെന്ന് കണ്ടുപിടിക്കുന്നതിനുവേണ്ടി തയ്യാറാക്കിയ അഭിമുഖമാണ് താഴെ കൊടുത്തിരിക്കുന്നത്.

ഫോക്ക്മാന്റെയും, ലാസറസിന്റേയും വൈഷമ്യാഭിമുഖീകരണ സിദ്ധാന്തത്തേയും ഉപവാക്യത്തേയും ആസ്പദമാക്കിയാണ് ഈ അഭിമുഖ ചോദ്യാവലി തയ്യാറാക്കിയിരിക്കുന്നത്. ഈ അഭിമുഖത്തെ നാലു പ്രധാന ഭാഗങ്ങളായി തിരിച്ച് ഓരോ ഭാഗത്തിനും ഉപഭാഗങ്ങളും ഉൾപ്പെടുത്തിയിരിക്കുന്നു.

1. ശിശ്രൂഷ സമ്മർദ്ദവും അഭിമുഖീകരണ രീതിയും
   a) അധിക ശിശ്രൂഷാചുമതലയും അഭിമുഖീകരണവും
   b) മറ്റു കുടുംബാംഗങ്ങളുടെ ശിശ്രൂഷവ്യതിചലനവും അഭിമുഖീകരണവും
   c) കുട്ടിയുടെ പെരുമാറ്റത്തിലെ അപാകതയും അഭിമുഖീകരണവും

2. കുട്ടിയുടെ വേദനമൂലമുള്ള മനോവ്യഥയും അഭിമുഖീകരണരീതിയും
   a) വ്യക്തിപരമായ വിഷമവും അഭിമുഖീകരണവും
   b) കുട്ടിയുടെ വേദനമൂലമുള്ള വിഷമവും അഭിമുഖീകരണവും
   c) അപര്യാപ്തമായ അറിവുമൂലമുള്ള വ്യഥയും അഭിമുഖീകരണവും
   d) വൈവാഹിക പ്രശ്നങ്ങളും അഭിമുഖീകരണവും
3. സാമൂഹിക സമ്മർദ്ദവും അഭിമുഖീകരണവും
   a) വ്യതിചലിക്കപ്പെട്ട സാമൂഹിക ജീവിതവും അഭിമുഖീകരണവും
   b) വ്യക്തിബന്ധങ്ങളിലുണ്ടാകുന്ന പ്രശ്നങ്ങളും അഭിമുഖീകരണവും

4. സാമ്പത്തിക സമ്മർദ്ദവും അഭിമുഖീകരണരീതിയും
   a) സാമ്പത്തിക പ്രതിസന്ധിയും അഭിമുഖീകരണവും

ക്രമനമ്പർ	അഭിമുഖീകരണ ചോദ്യാവലി	ഇല്ല 0	കുറച്ച് 1	ഏകദേശം 2	അധികം 3	വളരെയധികം 4
1.	കുട്ടിയുടെ ശിശ്രൂഷയിൽ നിങ്ങൾ അധികം സമയം ചിലവഴിക്കുന്നുണ്ടോ?					
2.	വേദനയുള്ള കുട്ടിയെ ആശ്വസിപ്പിക്കുന്നതിൽ ക്ഷീണം തോന്നുന്നുണ്ടോ?					
3.	നിങ്ങളുടെ ദിനചര്യകൾ അലങ്കോലപ്പെട്ടതു പോലെ തോന്നാറുണ്ടോ?					
4.	നിങ്ങൾ പതിവിൽ കൂടുതൽ അദ്ധ്വാനം ചെയ്യുന്നുണ്ടോ?					
5.	നിങ്ങൾക്ക് സ്വന്തം കാര്യങ്ങൾക്കായി ആവശ്യത്തിന് സമയം ലഭിക്കുന്നില്ലെന്ന തോന്നലുണ്ടോ?					
6.	വീട്ടിലുള്ള മറ്റു കുട്ടികളെക്കുറിച്ച് മനോവ്യഥയുണ്ടോ?					
7.	വീട്ടിലുള്ള മറ്റംഗങ്ങൾക്ക് വേണ്ടത്ര ശ്രദ്ധ നൽകാൻ കഴിയുന്നില്ലെന്ന് തോന്നുന്നുണ്ടോ?					
8.	നിങ്ങളുടെ മറ്റു കുട്ടികൾ അവരുടെ ആവശ്യങ്ങൾ നിറവേറ്റിക്കൊടുക്കുന്നില്ലെന്ന് പരാതി പറയുന്നുണ്ടോ?					
9.	നിങ്ങളുടെ ഭർത്താവ് / ഭാര്യ നിങ്ങളുടെ അനാസ്ഥയെക്കുറിച്ച് പരാതി പറയുന്നുണ്ടോ?					
10.	നിങ്ങൾക്ക് ആശ്വസിപ്പിക്കാൻ കഴിയാത്തവിധം കുട്ടി കരയുന്നുണ്ടോ?					
11.	നിങ്ങളുടെ കുട്ടി ശാഠ്യക്കാരനും / കാരിയും ദുർവാശിക്കാരനും / കാരിയുമായതായി തോന്നുന്നുണ്ടോ?					
12.	നിങ്ങളുടെ കുട്ടിയുടെ വേദനകൊണ്ടുള്ള					

ക്രമനമ്പർ	അഭിമുഖീകരണ ചോദ്യാവലി	ഇല്ല 0	കുറച്ച് 1	ഏകദേശം 2	അധികം 3	വളരെയധികം 4
	പെരുമാറ്റത്തിൽ വ്യത്യ തോന്നുന്നുണ്ടോ?					
13.	നിങ്ങൾക്ക് പരസഹായം വേണമെന്നു തോന്നുന്നുണ്ടോ?					
14.	നിങ്ങൾക്ക് സംസാരം ഇപ്പോൾ സാധാരണയിൽ കുറവ് ആണോ?					
15.	നിങ്ങൾക്ക് സംസാരം ഇപ്പോൾ സാധാരണയിൽ കൂടുതൽ ആണോ?					
16.	നിങ്ങൾക്ക് ഇപ്പോൾ വേഗം ദേഷ്യം വരാറുണ്ടോ?					
17.	നിങ്ങൾ വസ്ത്രധാരണത്തിലും വ്യക്തിദൃശ്യതയിലും കൂടുതൽ ബോധവതി/വാൻ ആയിട്ടുണ്ടോ?					
18.	നിങ്ങളുടെ ഭർത്താവോ / ഭാര്യയോ ആശുപത്രിയിൽ കുഞ്ഞിന്റെ ശുശ്രൂഷയിൽ സഹായിക്കുന്നുണ്ടോ?					
19.	നിങ്ങളുടെ ഭർത്താവ് / ഭാര്യ കുട്ടികളുടെ ഈ അവസ്ഥയിൽ നിങ്ങളെ കുറ്റപ്പെടുത്താറുണ്ടോ?					
20.	നിങ്ങൾ കുട്ടിയുടെ ശുശ്രൂഷയിൽ ആരുടെയെങ്കിലും സഹായം തേടിയിട്ടുണ്ടോ?					
21.	കുട്ടിയുടെ ചികിത്സയെപ്പറ്റി നിങ്ങൾ ബന്ധുക്കളുമായി ചർച്ച ചെയ്തിട്ടുണ്ടോ?					
22.	കുട്ടിയുടെ ശുശ്രൂഷയിൽ ഏതെങ്കിലും സന്നദ്ധ സംഘടനയുടെ സഹായം തേടിയിട്ടുണ്ടോ?					
23.	കുട്ടിയുടെ ആശുപത്രിയിൽ കിടത്തിയിട്ടുള്ള ശുശ്രൂഷയിൽ വീട്ടുകാർക്ക് എന്തെങ്കിലും അഭിപ്രായവ്യത്യാസമുണ്ടായിട്ടുണ്ടോ?					

ക്രമനമ്പർ	അഭിമുഖീകരണ ചോദ്യാവലി	ഇല്ല 0	കുറച്ച് 1	ഏകദേശം 2	അധികം 3	വളരെയധികം 4
24.	കുട്ടി വേദന അനുഭവിക്കുന്നതു കാണുമ്പോൾ ദേഷ്യവും ദൈവത്തോട് വിദ്വേഷവും തോന്നുന്നുണ്ടോ?					
25.	കുട്ടിയുടെ വേദനയിൽ മനോവേദനയും തുടർച്ചയായി തന്നെത്തന്നെ ശപിക്കുകയും ചെയ്യാറുണ്ടോ?					
26.	ദൈവാരാധനയിൽ കൂടുതൽ സമയം ഇപ്പോൾ ചെലവഴിക്കാറുണ്ടോ?					
27.	പതിവിൽ കൂടുതൽ ആരാധനാലയങ്ങൾ സന്ദർശിക്കുന്നുണ്ടോ?					
28.	കുട്ടിയുടെ വേദന കുറയുന്നതിനുവേണ്ടി പുതുതായി വഴിപാടുകൾ ചെയ്യുവാൻ ഉദ്ദേശിച്ചിട്ടുണ്ടോ?					
29.	ഇപ്പോൾ വിനോദത്തിനായി (ടി.വി. കാണുക, പാട്ടു കേൾക്കുക) കൂടുതൽ സമയം ചെലവഴിക്കാൻ തോന്നുന്നുണ്ടോ?					
30.	വേദന സംഹാരി കൊടുത്താൽ കുഞ്ഞിന് വേദന കുറയുമെന്ന് തോന്നുന്നുണ്ടോ?					
31.	വേദന സംഹാരി കുട്ടിക്ക് നൽകുവാൻ ആവശ്യപ്പെടാറുണ്ടോ?					
32.	കുട്ടിയുടെ ഓപ്പറേഷനെക്കുറിച്ചും വേദനയെപ്പറ്റിയും കൂടുതൽ വിവരങ്ങൾ ശേഖരിക്കാൻ ശ്രമിച്ചിട്ടുണ്ടോ?					
33.	ഡോക്ടർമാരിൽനിന്നും നേഴ്സ്മാരിൽനിന്നും കുട്ടിയുടെ അവസ്ഥയെപ്പറ്റി മനസ്സിലാക്കാൻ ശ്രമിച്ചിട്ടുണ്ടോ?					
34.	നിങ്ങളുടെ കുട്ടിയുടെ അവസ്ഥയുള്ള മറ്റു					

ക്രമനമ്പർ	അഭിമുഖീകരണ ചോദ്യാവലി	ഇല്ല 0	കുറച്ച് 1	ഏകദേശം 2	അധികം 3	വളരെയധികം 4
	കുട്ടികളുടെ മാതാപിതാക്കന്മാരുമായി കുട്ടിയുടെ അവസ്ഥ ചർച്ച ചെയ്യാൻ ശ്രമിച്ചിട്ടുണ്ടോ?					
35.	കുട്ടിയുടെ ചികിത്സക്ക് ധാരാളം പൈസ ചിലവാക്കിയോ?					
36.	കുട്ടിയുടെ ചികിത്സക്ക് നിങ്ങൾ ഏതെങ്കിലും കടം / ലോൺ എടുക്കേണ്ടി വന്നിട്ടുണ്ടോ?					
37.	നിങ്ങളുടെ ഏതെങ്കിലും സമ്പാദ്യം ചികിത്സക്കു വേണ്ടി ഉപയോഗിച്ചോ?					
38.	നിങ്ങൾക്ക് ഓപ്പറേഷനും ചികിത്സയുടെ മൂലം കാര്യമായ സാമ്പത്തിക ചോർച്ച / പ്രയാസം അനുഭവപ്പെട്ടോ?					

APPENDIX C

സമ്മതപത്രം

കോഴിക്കോട് നഴ്സിംഗ് കോളേജിലെ അസ്സോസിയേറ്റ് പ്രൊഫസർ ശ്രീമതി അസുമാബിവി റ്റി.എം. "ഓപ്പറേഷനുശേഷം കുട്ടികൾക്കുണ്ടാവുന്ന വേദനയും ഈ വേദന മാതാപിതാക്കൾക്കുണ്ടാക്കുന്ന വിഷമതകളും അവ നേരിടുന്ന മാർഗ്ഗങ്ങളും" എന്ന വിഷയത്തിൽ നടത്തുന്ന പഠനത്തിൽ പങ്കെടുക്കുന്നതിന് സമ്മതമാണ്. പഠന ലക്ഷ്യങ്ങൽ പറഞ്ഞ് ബോധ്യപ്പെടുത്തിയിട്ടുണ്ട്.

ഒപ്പ്

പേര്

സ്ഥലം
തിയ്യതി

APPENDIX D

NO OBJECTION CERTIFICATE

DIRECTORATE OF MEDICAL EDUCATION
MEDICAL COLLEGE P.O, THIRUVANATHAPURAM

No. G5/8296/98/DME Dated 6/8/98

CERTIFICATE

Certified that there is no objection in permitting Smt. Assuma beevi. T.M. Assistant Professor, College of Nursing, Kozhikode to register her name for Ph.D as a part-time Research Scholar with the University of Calicut and to undergo the course without affecting her normal duties in College of Nursing, Kozhikode.

Dr. Umadethan,
DIRECTOR

VS 10.8

APPENDIX E

PERMISSION CERTIFICATE FROM PRINCIPAL, MEDICAL COLLEGE, CALICUT

Office of the Medical College,
Calicut-8, Dated 13/10/98

From

The Principal

To

Smt. Assuma Beevi. T.M,

Asst. Professor in College of Nursing, Calicut.

(Through Professor and Head, CNC)

Madam,

Sub: Estt-MCC- permission to conduct Research study at the dept. of Paediatric Surgery- reg.

Ref: Lr. No. E/1178/98/CNC dt.25/9/98 from Prof &Head, CNC.

With reference to the above, you are permitted to conduct research study in the dept. of Paediatric Surgery without affecting your normal duties in College of Nursing, Calicut .

Yours faithfully,

For Principal

Copy to :

Prof. &Head, CNC

HOD of Paed: Surgery

APPENDIX F

AGREEMENT FROM THE SUPERVISING TEACHER

Whomsoever it may concern

I, Professor Dr. K. Karthikeya Varma, Emeritus Professor of Paediatric Surgery, Medical College, Calicut (Swathy, Calicut-17) approved as supervising teacher for research students as per PLD G2/ 1605/90 dated 27/9/1990 is willing to supervise the work of Mrs. Assuma Beevi. T.M., Asst. Professor, College of Nursing in her research work in the field of Paediatric nursing with the topic as Development of a tool to assess postoperative pain in children and parental coping towards pain in the newly formed Faculty of Health Sciences in the University of Calicut.

Prof. Dr. K. Karthikeya Varma
Emeritus Prof. of Paediatric Surgery
Medical College, Calicut

Calicut
19/02/2001

APPENDIX G

DIRECTORATE OF RADIATION SAFETY
Department of Health & Family Welfare
Government of Kerala

Medical College P.O
Kozhikode
Kerala- 673008

Drs 54/2001 dated 20-02-2001

To

The Registrar (Academic)
University of Calicut,
Calicut University (P.O)

Sir,

Sub: Request for Ph.D registration from Smt. Assuma Beevi. T.M. Asst. Professor, College of Nursing, Kozhikode.

Ref: 1. Letter dated 20-02-2001 from Smt. Assuma Beevi. T.M
2. Pld/ G1/ 3851/25/ Nursing. University of Calicut

Smt. Assuma Beevi. T.M., Asst. Professor, College of Nursing, Kozhikode has as per reference 2 cited above, applied for registration for Ph.D programme under Faculty of Health Sciences, University of Calicut.

In this context I am to certify that there is no objection for granting Smt. Assuma Beevi. T.M., registration for Ph.D in her chosen field under Faculty of Health Sciences of the University of Calicut.

Yours faithfully,

T.S. SANKARAN NAIR
Director of Radiation Safety &
Dean, Faculty of Health Sciences,
University of Calicut.

NB 3253