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PAIN ASSESSMENT IN COLOMBIAN PRE-SCHOOL AGE CHILDREN

by

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THESIS

Submitted in partial satisfaction of the requirements for the degree of

MASTER OF SCIENCE

in

NURSING

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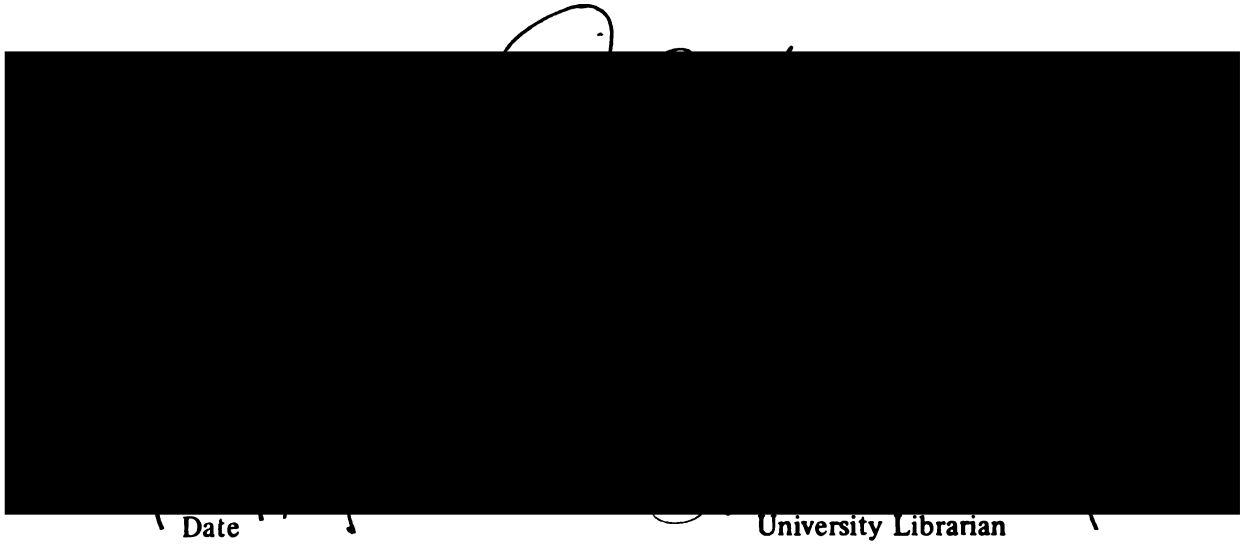
of the

UNIVERSITY OF CALIFORNIA

San Francisco



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Pain Assessment in Colombian Pre-School Age Children

Abstract

Edelmira Castillo E.

Pain, a perceptual experience affected by psychological, physiological, cognitive, and cultural variables, has been studied mainly in adults. Young children's experience of pain remains largely unknown. An exploratory descriptive research was designed to assess pain in pre-school age children. The goal of this study was to identify the pain behaviors exhibited by Colombian pre-school age children during the daily wound care of their burned areas. A convenience sample of three boys and three girls who were hospitalized in the burn unit was studied. Data was gathered using the time-sampling technique and a behavioral check list. Each child was observed once a week for three and/or four weeks. The pain behaviors were categorized in body movements, facial expressions, verbalizations, and vocalizations. The children exhibited 192 verbalizations, 136 facial expressions, 134 vocalizations, and 130 body movements. The verbalizations most often used were "ay," "ayayayay," "do it smoothly," and "mami, mami." Looking at their own wound, grimacing, and staring were the most

frequent facial expressions. Crying was the vocalization most shown by the children. The body movements most frequently exhibited were immobility, generalized shivering, and withdrawing affected extremity. Verbalizations and vocalizations were predominantly showed by the girls, while facial expressions were predominantly used by the boys. Younger children displayed more body movements, verbalizations, and vocalizations than older children. The findings of this study suggest that there are specific behavioral responses to pain which might be different for boys and girls and are affected by the child's cultural background. During painful procedures, nurses may allow the child to watch the procedure and participate in it. They also need to respond accordingly to the child's verbalizations. Pain relieving measures must be an important aspect of the child's nursing care regardless of the length and frequency of the painful experience.

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Chapter I. Introduction

Pain is a universal but individual and very personal sensation; it is manifested by human beings through physiological and behavioral responses. Behavioral responses have been used by researchers (Abu-Saad, 1984; Taylor, 1983; McCaffery, 1979) to assess pain in children. The pain behaviors identified by these authors include: body movements, facial expressions, verbalizations, and vocalizations. These pain behaviors are very useful and can serve as tools for assessing pain in young children whose cognitive development limits their ability to communicate their pain as well to understand the situation.

This study is concerned with the identification of the pain behaviors exhibited by pre-school age Colombian children during the daily wound care of their burns.

Pain is not an ordinary sensation. It is a perceptual experience affected by physiological, cognitive, psychological, and cultural variables. Melzack and Wall (1983) believe that the individual´s pain history, the meaning he gives to the pain situation, and his "state of mind" at the moment play a role in determining the pattern of nerve impulses that go from the body to the brain. In other words, pain

becomes a function of the whole person, his thoughts, fears, and hopes. Many definitions have been given for pain, but none of them has been accepted as completely satisfactory. McCaffery (1979) says that "Pain is whatever the experiencing person says it is and exists whenever he says it does." (p. 11) The International Association for the Study of Pain defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (Merskey, 1979, p. 250). The measurement of pain by researchers and clinicians has been difficult due to the complexity and subjective nature of the pain phenomenon. This difficulty has been documented by Copp (1974), Jacobs (1979), Heidrich and Perry (1982), and Mccaffery (1979). When the suffering person is a child, additional factors such as developmental stage, parent-child interactions, and environment-child interactions make the assessment task even more difficult. In this instance, the health professionals base their assessment on their belief systems, their intuitions about the child's behaviors, and sometimes on unproven assumptions or myths about children's pain. The result is a biased and one-sided assessment of children's pain because on one hand children may not be able to report their pain, and on

the other hand, health professionals are judging children's experiences from an adult point of view. This type of assessment may lead to errors in the management of children's pain.

Health professionals have the obligation to develop valid and reliable tools to assess pain. When assessing pain, researchers and clinicians have heavily relied on the individual's verbal report of his pain. This is a very valid way to assess pain since the suffering person is the best judge of his pain. However, this assessment method is not applicable when the individual's ability to report his pain is diminished by his clinical situation or by his developmental characteristics; for example, adults with disrupted levels of consciousness, infants, toddlers and pre-school age children. In these cases, observation of physiological and behavioral responses to pain are the only way to assess the presence of pain. Physiological changes are present in acute but not in chronic pain. Behavioral responses, even though they are not specific indicators of pain especially among children, are very valuable in pain assessment. Pain behaviors, however, have not been the subject of research despite the agreement on the need to observe children's behaviors as a means to assess pain in young

children.

Most of the research to assess pain has been conducted among adults, teenagers, and school age children. Very few studies have addressed pain in pre-school age children. This lack of research accounts for the limited knowledge about children's pain experience and for the lack of tools to assess it. The information gathered by the present study could be useful in developing a tool to assess pain in pre-school age children.

Research Questions:

This study will address the following questions:

1. What are the body movements, facial expressions, verbalizations, and vocalizations exhibited by Colombian pre-school age children during a painful procedure such as the daily wound care of their burn wounds?
2. What are the differences between boys and girls in exhibiting pain behaviors?
3. What are the differences between younger and older children in exhibiting pain behaviors?

Significance of the Study:

Nursing is concerned with the well-being of people in general and patients in particular. Since pain is one of the most common problems affecting patients'

well-being, nurses must find appropriate ways to help them in relieving and coping with pain in order to protect and promote their comfort and safety. But first, nurses must be able to reliably assess pain, which is a very difficult task, especially in young children. In Colombia, there is a tendency among health professionals to view pain as something that patients must endure. There is also a feeling among patients and their families that health professionals, especially nurses, are insensitive to the pain they are experiencing. This situation may be due to the health professionals' cultural values and beliefs about pain and to the patients' expectations from the health care providers. It seems that regardless of the culture, patients and their families want relief for the pain they are actually experiencing.

As members of the Hispanic culture, Colombian people share certain characteristics with people from Spain, Central and South America. Samora (1978) states that Spanish-Americans' conceptions of health and illness are influenced by the Catholic religion. Catholics believe man's destiny is suffering and hardship. The reward is to save one's soul for life in heaven. One's life is in God's hands and He will take care of one through life. Therefore, one must accept

God´s will and submit to it (Samora, 1978). Health is defined by Hispanics as the ability to work, resulting from good behavior, good luck or as God´s gift (Silva, 1984). Illness can be seen as punishment for wrongdoing, caused by God´s will, other supernatural causes (witches), or natural causes such as excess within the body of "hot" or "cold" factors (Samora, 1978; Silva, 1984). Illness is a family affair; the extended family and friends are very supportive and gather around the ill person to give advise and help. Disease is treated through the: (a) coercion of extrahuman causes by praying to God or Saints, pilgrimages to holy places, use of holy material, and intercession of folk healers (curanderos, espiritistas); (b) use of lay practitioners such as family members, friends, curanderos, hierbateros, boticarios, etc.; (c) use of folk remedies; and (d) use of traditional medicine and medical practitioners (Samora, 1978). If the health system does not satisfy the patient or his family, they may go to a folk practitioner (Silva, 1984). The consequences of this decision are sometimes fatal for the patient.

Children are precious to Hispanic families. Parents want the best for their children. The younger ones are constantly with the mother or a caretaker. In

poor families, children are supposed to work and help in household activities. Boys are taught the male role from early years of life, and girls are prepared for marriage and motherhood. Children do not leave home until they marry (Silva, 1984). The above cultural values are shared by patients and health care professionals. Health professional values and beliefs about suffering and pain affect their inferences of patient´s pain (Mason, 1981) and their expectations about the patient´s behavior when in pain.

Most of the pain literature is the result of research done in the United States of America, a country with a very different culture from the one in Colombia. Since pain is a subjective experience greatly affected by the culture in which the suffering person lives, one must be very cautious when applying concepts from the North American literature about pain to Colombian patients. It is also very important to investigate which concepts are applicable to Colombian people. This study is the first step in obtaining information about the pain experience among Colombian pre-schoolers. On the other hand, the findings of this study could help to increase the knowledge about the pain experience among young children in general.

Assumptions: The assumptions upon which this study has been founded are the following:

1. Pain is a very subjective and individual experience. For this reason, pain could be felt but not demonstrated.
2. Young children have difficulty in communicating their pain due to their developmental characteristics.
3. Pain is exhibited by behaviors that can be observed.
4. Pain, anxiety, and fear are related phenomena, and difficult to differentiate, especially among young children.

Definitions of Terms:

The following terms used in the study are defined:

Pain: "An unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage." (Merskey, 1979, p. 259)

Pain behaviors: Body movements, facial expressions, verbalizations, and vocalizations exhibited by the child during a painful event.

Body movements: Movements of extremities, trunk, and head, such as kicking, moving head side to side, trying to hold nurse's hand, etc.

Facial expressions: Facial gestures such as tightly shut eyes, wrinkled forehead, grimacing, biting lower lip, etc.

Verbalizations: Speech sounds that have meaning such as "Stop it!," "No!," "It hurts," etc.

Vocalizations: Uttered sounds that do not have specific meaning such as crying and screaming.

Chapter II. Theoretical Framework

The theoretical framework, upon which the present study is based, includes the gate control theory of pain and Piaget's and Erikson's developmental theories. The relevant concepts of these theories that can be related to the children's pain experience will be discussed in this section.

The Gate Control Theory of Pain

An adequate understanding of the concept and mechanisms of pain by health care professionals will contribute to a more reliable assessment of the patient's pain experience and the formulation and implementation of effective interventions to relieve the patient's pain.

Different theories have been postulated to explain the pain phenomenon. The theories have undergone evolutionary changes as a result of experimental studies and clinical observations. Currently, the most widely accepted pain theory is the "gate control theory" postulated by Melzack and Wall in 1965. They attempted to integrate the diverse aspects of the pain experience. The model of the gate control theory is based upon the following assumptions (Melzack and Wall, 1983):

1) The nerve impulses transmitted from different fibres to the spinal cord transmission (T) cells are modulated by the spinal gating mechanism in the dorsal horn. This mechanism seems to be located in the substantia gelatinosa (SG).

2) The gate control mechanism is influenced by the amount of activity in large-diameter (L) and small-diameter (S) fibres. Large fibre activity tends to inhibit the transmission of nerve impulses (close the gate) while activity in small fibres tends to facilitate transmission (open the gate).

3) The spinal gating mechanism is affected by nerve impulses descending from the brain.

4) A specialized system of L fibres, which are rapidly conducting fibres, called "the Central Control Trigger" activates selective cognitive processes such as memories of prior experience and pre-set responses that influence the modulating properties of the spinal gating mechanisms.

5) "The Action System" is activated when the output of T cells reaches or exceeds a critical level. "The Action System" is

> responsible for the complex and sequential pattern of sensations and behaviors of pain (Melzack and Wall, 1983).
>
> The authors of this theory admitted that it is not the "final truth" about pain. They emphasize that the assumption that the substantia gelatinosa is the primary vehicle for gating remains an assumption and is not yet substantiated.

The pain response is affected by a number of factors, such as integrity of the nervous system, level of consciousness, meaning of the situation, training and past experience in pain control, attention and distraction, anxiety, and fatigue (Mennie, 1974; Melzack and Wall, 1983). All these factors play an important role in determining the pattern of impulses that goes from the body to the brain. Accordingly, pain becomes a function of the whole individual, including his thoughts, fears, and hopes (Melzack and Wall, 1983). Therefore, the developmental characteristics of the individual must be acknowledged to assure a comprehensive management of the individual's pain.

Developmental Theories:

The pre-school age child has unique developmental characteristics which influence his pain experience and his pain response. During the pre-school years, the child undergoes important changes in the psychological and cognitive areas. Developmentalists such as Piaget and Erikson have developed theories to explain those developmental changes.

Piaget (1962) who developed the cognitive theory to describe how cognition develops in humans, has identified the ages of two to seven years as the pre-operational period. This stage is considered to have two phases: a) the pre-conceptual or symbolic phase from two to four years, and b) the intuitive phase from four to seven years. During the pre-school years a genuine symbolic function appears. The child has the ability to evoke a "signifier" (words, images, etc.) which symbolizes the "significant" (internal representations of earlier experiences to which the words or images may refer) (Phillips, 1975). The development of signifiers as symbols depends upon the child's ability to identify a signal as a precursor of an event (Brown and Deforges, 1979). "The entrance into the pre-operational period is marked by increasing internalization of representational actions and

increasing differentiation of signifiers from significates" (Phillips, 1975, p. 63). The child acquires the ability to form mental representations of persons, objects, and events. He can imagine things that are spatially and temporally separate from him. This enables the child to transcend the constraints of space and time (Ginsburg and Opper, 1979). Phillips (1975) identified the following limitations or characteristics of the pre-operational thought: a) concreteness, b) irreversibility, c) egocentrism, d) centering, e) states vs. transformations, and f) transductive reasoning. Although the pre-operational child has the ability to manipulate symbols, he is still very concrete-minded. The child's cognition tends to be an exact step-by-step mental replica of the concrete actions or events. The child's inability to take another person's point of view is called egocentrism. The world is as it looks to the child. He will acquire the ability to take others' views as the result of his continuous interaction with other human beings and with the physical environment.

The child also has the tendency to center his attention on a single, predominant feature of the event; he is unable to see compensatory changes that

occur. The preoperational child has difficulty in seeing the sequence or transformation of an event. It is said that the child attends to stages, not to transformations. According to Piaget, the pre-operational child's reasoning is "transductive." He reasons from particular to particular instead of reasoning from particular to general (deductive reasoning) or from general to particular (inductive reasoning). The consequences of the transductive reasoning are: a) inability to understand the concept of hierarchy, and b) inability to make right conclusions about the events the child has witnessed (Phillips, 1975).

Erikson (1963, 1982) has called the pre-school years "the play age" and he has ascribed the psychosocial conflict of initiative versus guilt to this age. "Guiltiness, of course, rules against habitual autoeroticism and the fantasies it serves, while initiative opens manifold avenues of sublimination in dextrous play and in basic patterns of work and communication" (Erikson, 1982, p. 30). Inclusive and intrusive modes dominate the play age. Intrusion into space by vigorous motor activity, into other bodies by physical attacks, into others' ears and minds by loud sounds, and into the unknown by infinite

curiosity has been observed. The inclusive mode may be expressed by unexpected alteration of the aggressive behaviors into a quiet receptivity of imaginative material and a readiness to develop tender and protective relationships with peers and younger children. From a psychoanalytic point of view, Erikson has accepted that autoeroticism and oedipal fantasies are present in the pre-school years. He has called this age "infantile-genital stage" instead of "phallic phase." This stage is considered to be "dominated in both sexes by combinations of intrusive and inclusive modes or modalities" (Erikson, 1982, p. 37).

The pre-school age children's psychological and cognitive characteristics make their pain experience very different from that of older children or adults. The egocentrism, concreteness, transductive reasoning, centering, and irreversibility of their cognitive process make it difficult for pre-schoolers to understand that pain is the result of a pathological process and that some painful procedures done to them are beneficial. Instead, they will perceive pain as the result of something wrong they did. The painful procedures will be seen as punishment or harmful events that they should avoid by running out, kicking, or using other behaviors that adults call "aggressive

behaviors." Sometimes, such as in the case of burns, the pain situation is so overwhelming for the children that they tend to withdraw from the environment or become depressed. The children's perception of the pain experience influences the meaning they give to their pain and it will affect their overall behavior and response to pain. Long-term effects of pain on children are unknown but it is accepted that the pain history of an individual will affect the way he responds and copes with future pain experiences (Melzack and Wall, 1983).

Literature Review

The literature on pain in children is scarce in comparison with the literature on the adult's pain. The majority of studies on children's pain focus on pain as a symptom of pathology; these studies will not be reviewed here. Rather, research literature addressing children's pain perception, pain response, and variables affecting the pain experience will be the focus of this review.

Children's Perception of Pain

The precise age at which pain is first perceived is unknown. Some health professionals believe that infant and young children are relatively insensitive to pain. These beliefs are likely to be based on the idea that the perception of pain depends on the degree of cortical development and myelination of the nervous system. While cortical development may be necessary for pain memory, complete myelination of the nervous system is not required for the function of the nerve tract (Mennie, 1974). Myelin appears in the newborn's major sensory systems (Volpe, 1981). Myelination of the cerebral hemispheres occurs well after birth and progresses over decades. Nerve conduction velocity increases with gestational age; it reaches adult values at three to four years of postnatal age (Volpe, 1981).

Therefore, the transmission of stimuli is similar in children and adults. Normal neonates can react to painful procedures by crying, increase in heart rate, and a decrease in subcutaneous oxygen levels (Williamson and Williamson, 1983). Although neonates can not localize or identify the source of the pain, the painful stimulus is thought to reach the thalamus and be referred to higher centers (Mennie, 1974). Peiper (1963) said that newborns and infants have the same right that adults have to be protected against pain during surgical interventions because of their sensitivity to pain. Swafford and Allen (1968) concluded that older infants and children do not complain of postoperative pain, they are afraid and want their parents, but they do not relate their fear to the operative site. However, Taylor (1983) found that toddlers and pre-school age children utilize a repertoire of movements and vocalizations which clearly indicate that they experience pain after surgery. Mennie (1974) stated that the transmission of a painful stimulus in children depends on the developmental stage of the nervous system and the pain threshold which as in adults, depends on the basal state. For example, a child who is not hungry or who is calm is less sensitive to pain than a hungry or intranquil child.

The process of learning about pain starts at birth. Later, the appreciation of pain is influenced by the mother's behavior, so the child is learning from his own experience and from the environment. Many children do not know the meaning of the word "pain"; therefore they do not explain or recognize it despite its presence (McCaffery, 1977).

The perception of pain generates a series of physiological and behavioral changes that are useful in assessing the presence and intensity of pain.

Physiological Response to Pain

The nature of the physiolocigal response to pain depends upon the duration of the pain and the amount of anxiety associated with it (McCaffery, 1979). The first pattern of the physiological response is referred to as activation, which can last from minutes to one hour and is often called "the fight or flight reaction." During this period the sympathetic nervous system is activated and the following signs are observable: increase in blood pressure, heart rate, and respiration; pallor; dilated pupils; increase in muscle tension or body movements; cold perspiration and raised hairs in some areas of the body. The person may report nausea or vomiting (McCaffery, 1979). These

signs reflect a great physiological activity. Blood shifts from the viscera and superficial vessels to the striated muscles, lungs, heart, and central nervous system. The levels of blood glucose and adrenalin are increased. Some investigators have noticed an increase in alveolar ventilation and oxygen consumption, and a decrease in alveolar carbon dioxide concentration.

When pain is brief but intense, a parasympathetic response may occur. The extreme physiological response cannot continue for long periods of time; therefore if the pain persists the body begins to adapt by decreasing the sympathetic response. After days of persisting pain the general adaptation syndrome occurs. It depends upon hormonal changes and reactions which include greater production of 17-ketosteroids and eosinophils (Johnson, 1977; McBride, 1977; McCaffery, 1979; Webb, 1966).

The physiological responses to pain can be useful in assessing pain but they are not always present and evident, and are absent in patients with chronic pain.

Behavioral Responses to Pain

These include body movements, facial expressions and vocalizations. McCaffery (1977) has identified four predominant body movements: immobile, purposeless or inaccurate, protective, and rhythmic or rubbing.

Children tend to immobilize their whole body after massive trauma or only the affected part in cases of small injury. Patients may choose the most comfortable position or sustain whatever position they happen to be in. The purposeless movements are due to fear, trembling or the patient's inability to find comfort. Protective movements prevent the increase or occurrence of pain. These movements may take the form of consciously controlled flight reaction or involuntary reflex response. Rubbing movements may be an excellent clue for the location of pain, especially in children. Facial expressions may indicate the severity and meaning of the pain when patients do not verbalize it. The patient may have clenched teeth, tightly shut lips, widely opened or tightly shut eyes, wrinkled forehead, biting lower lip, or other facial contortions. Vocalizations include: groaning, grunting, whimpering, whining, crying, sobbing, screaming, gasping, and many others (McCaffery, 1979).

Taylor (1983) in a descriptive study about postoperative pain in toddlers and pre-school children found they utilized a repertoire of body movements and vocalizations to express their pain after surgery. Extreme restlessness and crying occurred initially as totally disorganized responses. After they had

controlled their restlessness, the children consistently guarded and contacted their operative site, and limited their mobility. Their vocalizations included crying, screaming, groaning, whining, and verbal statements of pain.

Abu-Saad and Holzemer (1981) assessed the pain response of ten hospitalized school-age children using a 10-cm scale, physiologic parameters, and pain behaviors. They found a positive correlation between the self-rating of the pain intensity on the 10-cm scale and the presence of pain indicators (body movements, vocalizations, and facial expressions). The correlation was higher for pain indicators than for physiologic parameters such as temperature, pulse, respiration and blood pressure. Smith (1979) suggested a list of behaviors and physiological responses that can be observed to assess children's pain. Children's perception of pain and their response to it are greatly affected by the developmental stage they are going through, the culture they live in, and by certain psychological factors such as fear, anxiety, stress, etc. The acknowledgement of the above variables is crucial in the assessment and management of the children's pain experience.

Developmental Stage

Children's perception and response to pain are influenced by their developmental stage since the meaning of the pain experience is related to the level of cognition and the psychological state.

Scott (1978) studied children's perception of pain. She selected 58 children aged four to ten years from outpatient clinics and schools. She found that the younger group (four to six years) had more clearly differentiated sensory perceptions of pain related to color, texture, shape, and continuity than the older group (seven to twelve years). Her finding is congruent with Piaget's theory where the preoperational child responds to reality in an intuitive manner and the concrete operational child responds with cognitive types of associations in his description of pain. In addition, the majority of children perceived the pain inflicted by a needle and a hammer blow as red, the pain of a needle as jagged rather than smooth, and the pain of a hammer blow as continuous. However, the author admitted that the study was exploratory and the findings were not statistically significant. Additional studies are needed to confirm these results.

Eland (1977) asked 172 children aged four to ten years to place an X on a body outline to show where

they hurt. Ninety-seven percent of the children correctly placed the X on the body outline and told the investigator why that area hurt. The placement of the X coincided with the child's pathology, surgical procedure or painful events that had occurred during the hospitalization. Eland suggested that a child can communicate by graphic means information he cannot communicate verbally. Schultz (1971) studied 74 ten and eleven year old boys and girls from different social status. Her findings included: fear of death and body injury was felt by all children; 10% of the children said that when they are in pain they wanted to cry and did; 86% of the children connected pain with being afraid and nervous, some related pain with missing school or not being able to play sports. The eleven year old children viewed pain from a purely psychological point of view, whereas the ten year old children described pain in physical terms. Savedra, Gibbons, Tesler, Ward, and Wegner (1982) studied 214 hospitalized and non-hospitalized children, aged nine to twelve years. The researchers administered a questionnaire containing six questions related to the child's pain experience. The results showed that children can clearly describe pain. Hospitalized children more frequently listed causes of pain related

to illness and medical procedures than did non-hospitalized children. Children were also able to select a variety of pain descriptors from a given list and their own descriptions were often quite graphic. Hospitalized children more often than non-hospitalized children selected words to describe pain related to tension, fear, and overall intensity and indicated that when they have pain they feel like crying and do cry, feel like screaming and are nervous. The authors concluded that their findings would indicate that it is appropriate to ask children to describe their pain and feelings related to pain.

Jeans (1983) studied the development of the pain concept among children five to thirteen years of age by interviewing them and asking them "to draw a picture that shows pain." She found that most children conceptualized pain as a human experience; none of the children ascribed pain to inanimate objects. Young children depicted pain solely in terms of concrete events related to their own day-to-day experience. Older children included emotional pain, thus incorporating abstract components to the pain experience. These findings are congruent with Piaget's theory of cognitive development and have been supported by Abu-Saad (1984), Schultz (1971), and Scott (1978).

The strategies utilized by the children to cope with pain are also affected or determined by their developmental stage. Jeans (1983) found that younger children (five to nine years of age) reported physical or direct actions almost exclusively while older children (eleven to thirteen years of age) reported more psychological strategies.

Tesler, Wegner, Savedra, and Gibbons (1981) in the study of 214 hospitalized school-age children found that children identified a variety of strategies for coping with pain. Girls and non-hospitalized children reported a larger number and variety of coping strategies. The strategies used by these children included: medicines, shots, pills, presence of the mother or others, food and drink, touching, hugging and cheering up, and distraction. The coping strategies identified by hospitalized and nonhospitalized children were different in number and type. Hospitalized children identified medicines and parental "caring" more often than non-hospitalized children. This difference shows that the dynamics of the individual-environment interaction determine the coping behaviors.

Psychological Variables

Pain causes a change in the way children feel about themselves and the way they interact with the

environment. Pain draws all attention to itself and therefore limits awareness of the environment, increasing the child's preoccupation with his body. This increase produces stress which increases pain and a vicious cycle is established (McBride, 1977). Pain also produces anxiety, hostility, anger, anguish, and depression. These emotions decrease when the patient develops strategies to control and cope with his pain. The data from different studies (Bowers, 1968; Glyn, 1971; Hokanson, DeGood, Forrest, and Brittain, 1971; Wynn Parry, 1980) indicates that psychological variables may intervene to produce high variability between the stimulus and its perception. The psychological evidence strongly supports the view of pain as a perceptual experience; its quality and intensity are influenced by the past pain history of the individual, the meaning he gives to the situation, and his "state of mind" at the moment (Melzack and Wall, 1983). These authors believe that psychological factors play a role in determining the pattern of nerve impulses that goes from the body to the brain and vice versa. When attention is focused on the pain situation, the person perceives pain more intensely due to the anxiety he or she is having, but this does not occur if the person has control over the pain-producing

stimulus (Melzack and Wall, 1983). In contrast, when attention is directed toward other events, the pain is diminished. The recognition of the above factors has led to the development of various non-pharmacological techniques for alleviating pain such as relaxation, biofeedback, use of imagery, and hypnosis.

Cultural Variables

Cultural values and attitudes are known to play an important role in the way a person perceives and responds to pain. It is often asserted that variations in pain experience from person to person are due to different pain "thresholds" (Melzack and Wall, 1983). According to these authors, there are four thresholds related to pain, which are measured by applying electric shock or radiant heat to the skin: a) sensation threshold (the lowest stimulus value at which a sensation such as tingling or warmth is first reported); b) perception threshold (the lowest stimulus value at which the person reports that the stimulus feels painful); c) tolerance or upper threshold (the lowest stimulus value at which the person withdraws or asks to stop the stimulation); and d) encourage tolerance (the same as c but the person is encouraged to tolerate higher levels of stimulation).

There is evidence that all people have a uniform

sensation threshold regardless of cultural background (Sternbach and Tursky, 1965). However, cultural background has powerful effect on the pain perception threshold (Melzack and Wall, 1983). For example, levels of radiant heat reported as painful by Mediterranean origin people (Italians, Jews) are described as warmth by Northern Europeans (Hardy & Wolff and Goodall, 1952). Nepalese porters require much higher intensities of electric shock than occidental visitors before they feel pain (Clark & Clark, 1980). The major effect of cultural background is on pain tolerance levels. Sternbach and Tursky (1965) reported that levels at which subjects refused to tolerate electric shock depended, at least in part, on their ethnic origin. The differences in pain tolerance reflect different attitudes toward pain. Zborowski (1952) found that old Americans tend to withdraw and avoid behavioral responses when pain is intense. Jews and Italians tend to be vociferous in their complaints and openly seek support and sympathy; they believe it is natural to cry and moan when they have pain. The Irish are similar to old Americans in their reaction to pain but they have high tolerance to pain and seem to be proud to handle pain.

The influence of cultural background on children's

pain experience has been studied by Abu-Saad (1984). She interviewed 72 school-age children from Arab-American, Latin-American, and Asian-American backgrounds. The results of the study showed that causes of pain did not differ considerably among the three cultural groups, suggesting the universality of causative factors of pain. Arab-American and Latin-American children used more sensory words to describe pain while Asian-American children used more affective and evaluative words in describing pain. Children's feelings when in pain varied among the three groups which supports the idea that cultural background influences attitudes toward pain. Coping strategies were similar for the three groups.

Children learn how to behave when they are in pain from their parents, family, friends, and other adults. Children learn which behaviors are acceptable and which are not, to whom they should report their pain, and what to do for relieving it. Since the family transmits cultural norms to the child, it is important for the health professional to assess the family's behaviors and attitudes toward pain. Cultural values and attitudes also affect the health professionals' inferences on the patient's pain (Mason, 1981). Therefore, health care givers must be cognizant of

their own attitudes toward pain and not let those attitudes dominate the way they assess their patients' pain.

The literature concerning children's pain perception, pain response, and variables affecting both pain perception and response have been discussed. Children's perception of pain is similar to the adults' perception of pain from a physiological point of view. However, since pain perception depends on the person's psychosocial and cognitive state and the meaning the person gives to the pain situation, one must conclude that children's pain perception varies from that of adults. By the same token, children's responses to pain are different from adults' response to pain. Researchers have reported that children are able to perceive, describe, and express their pain. The difficulty lies in the adults' ability (researchers and clinicians) to get this information from children. Observation of physiologic and behavioral changes due to pain is one way to assess the presence of pain, but it must be kept in mind that pain is a very subjective experience and that its perception as well as its expression are very individual. Therefore, the assessment and management of the patient's pain experience should also be individualized.

Chapter III. Methodology

This chapter will address the study design, setting for the study, sample, data collection procedure, and instrumentation.

Design of the Study

This study uses an exploratory and descriptive design. The goal of the study is to identify the body movements, facial expressions, vocalizations, and verbalizations exhibited by Colombian pre-school age children during the daily wound care of their burns.

Setting for the Study

The data was collected in the Burn Unit of a pediatric teaching hospital in Bogotá, Colombia, South America. The unit had 22 beds for the treatment and rehabilitation of burned children from families with low economic resources. The children admitted to the unit came from peripheral areas of Bogotá, a city of four million people, and from geographically distant cities and towns of the country. Most of the parents visited their children once a month or whenever they could afford to travel to the hospital. Visitors were allowed once a week during scheduled visiting hours. Exceptions were made when parents who live very far came in at different hours or days.

The procedure used for wound care is the closed method, which entails keeping the burned area covered with a gauze dressing and an elastic bandage. The procedure for the daily wound care is as follows: after breakfast, the child gets a shower, during which the old dressing is removed. Immediately after the bath, the child is taken to the treatment room where the nurse cleans the wounds with gauze soaked in sterile water or normal saline solution and then applies the new dressing. The dressing can contain vaseline or furacin, depending upon the presence or absence of infection. The dressing is held in place by an elastic bandage. The wound care is routinely done by vocational nurses who have worked on the unit for periods of time ranging between three to fifteen years. The registered nurse (head nurse of the unit for twelve years) does the first wound care after grafting. No analgesics or sedatives are given to the children before or after the daily wound care. The majority of the nurses were very kind to the children and allowed them to cry or scream within limits. All nurses expected the cooperation of pre-school and school age children during the wound care.

Sample

The subjects were selected from the children hospitalized on the burn unit using the following criteria: a) age: three to six years, b) diagnosis: second and/or third degree burns with burned area equal or less than sixty per cent, and c) absence of evidence of mental retardation or developmental delay. A convenience sample of three boys and three girls who met the criteria and were hospitalized on the unit between August 13 and September 10, 1984, was selected for the study. Table 1 shows the sample profile.

Table 1

Sample Characteristics

Patient #	Age	Sex	Degree of Burn	Percentage of Burn
1	4 years	F	II	18%
2	6 y-9m	F	II-III	45%
3	3 years	F	II	21%
4	4 years	M	II	18%
5	6 years	M	II-III	20%
6	4 years	M	II	15%

The study was approved by the Committee on Human Research of the University of California, San

Francisco. Consent was obtained from the Director and the Head Nurse of the Burn Unit to conduct the study. In Colombia, the child's parents sign a general consent form which covers medical treatments as well as participation as research subjects during the hospitalization period.

Data Collection Procedure

The method chosen to measure the dependent variable, the behavioral indications of pain, was naturalistic observation using the time-sampling technique. A tape recorder with ear phones and a tape with synchronized 10-second periods for observing and recording the behaviors was used by the researcher to time the data collection. The researcher stood near the child and observed his/her behavior during 10-second periods. The observation of the child's behavior was done from the moment the nurse began to clean the wounds until the moment the child was allowed to leave the treatment room. The observed pain behaviors were recorded using a check list. Each child was observed separately once a week. Four children were observed for four weeks and two children for three weeks, which account for a total of 22 observations for six children.

Instrument

The check list used to record the children's pain behaviors was developed by the researcher based on a thorough review of the literature on children's manifestations of pain. The tool was tested by the researcher in a pilot study of ten burned children over a period of two weeks. The check list was then modified by adding new pain behaviors and dropping others. The instrument's content validity was achieved by consulting nurse experts in the fields of child development, children's pain, and burn management who agreed that the behaviors selected are indicative of pain. The tool includes pain behaviors categorized as body movements, facial expressions, verbalizations, and vocalizations. (See Appendix No. 1: Pain Behaviors Check List.)

Chapter IV. Results

A non-participant observation was carried out to identify the pain behaviors exhibited by three boys and three girls aged three to six years, during the daily wound care of their burned areas. The data collected through 22 observations will be presented using tables that show the frequency of the observed behaviors. Variables thought to affect the pain response, such as age and sex, were considered for the analysis of the data. Percentage of extension and degree of burn were not considered because even though there were children with similar percentages of extension and degree, the conditions of the wound and the children were too different to allow valid comparisons. The description of the individual cases will provide more complete data about the children's conditions and the specific behaviors exhibited.

Pattern of Pain Behaviors

The children exhibited a total of 592 pain behaviors, distributed as follows: 192 verbalizations, 136 facial expressions, 134 vocalizations, and 130 body movements. A more descriptive analysis of each category of behaviors showed the following results:

Body movements: the subjects exhibited eleven

different body movements as indicators of pain. Table 2 includes the specific body movements observed. Immobility (58) was the most frequent body movement, while biting own or nurse's hand (1) was the least frequent. Generalized shivering (24) was second and withdrawing affected extremity (12) was third. Two of the six subjects were restrained during four observations.

Facial expressions: Looking at own wound (49) was the most frequent facial expression shown followed by grimacing (36), and staring (19). See Table 3 for the frequency of facial expressions exhibited by the children.

Table 2

Frequency of Specific Body Movements as Indicators of Pain (N = 22 observations; 6 children).

Body movements	**Frequency**	**Percentage**
Immobile	58	45
Generalized shivering	24	18
Withdrawing affected extremity	12	9
Trying to hold nurse´s hand	8	6
Kicking	8	6
Tightly holding forehead	6	5
Tightly holding stretcher	4	3
Moving head side to side	4	3
Shaking hands	4	3
Biting own hand	1	1
Biting nurse´s hand	1	1
Total	130	100

Table 3

Frequency of Facial Expressions as Indicators of Pain

(N = 22 observations; 6 children)

Facial Expressions	**Frequency**	**Percentage**
Looking at own wound	49	38
Grimacing	36	26
Staring	19	14
Wrinkled forehead	10	7
Tightly shut eyes	10	7
Tightly shut teeth	8	6
Blinking	2	1
Widely opened mouth	2	1
Total	136	100

Verbalizations: Nine different verbalizations were used by the children to express their pain or their attempts to get help during the wound care. The most common verbalizations were: "ay!" (50), "ayayayay!" (38), "hagame pasito"/do it smoothly (28), "mami, mami" (25), "no mas"/no more (19), and "no" (12). Table 4 shows the frequency of the verbalizations exhibited by the children.

Table 4

Frequency of Verbalizations and Vocalizations as Pain Indicators (N = 22 observations; 6 children)

Behaviors	Frequency	Percentage
Verbalizations		
Ay!	50	26
Ayayayay!	38	20
Hagame pasito (Do it smoothly)	28	15
Mami, mami	25	13
No mas (No more)	19	10
No!	12	6
Me duele (It hurts)	12	6
No me haga duro (Don´t do it hard)	6	3
Yo soy macho (I´m macho)	2	1
Total	192	100
Vocalizations		
Crying	78	58
Screaming	56	42
Total	134	100

Vocalizations: crying (78) was the vocalization mostly used by the children, followed by screaming (56).

Pattern of Pain Behaviors by Sex

Girls exhibited more pain behaviors than boys. Verbalizations (80), vocalizations (84), and body movements (72) were predominately used by girls while facial expressions (72) were predominately used by boys. Table 5 shows the specific behavioral indicators of pain exhibited by boys and girls. The most frequent body movement shown by both sexes was immobility. Other body movements exhibited by boys were withdrawing affected extremity (12), tightly holding forehead (6), and generalized shivering (5). Girls more commonly exhibited, besides immobility, the following body movements: generalized shivering (19), kicking (7), and trying to hold nurse's hand (3).

Table 5

Frequency of Pain Behaviors Exhibited by Boys and Girls (N = 18 observations; 9 observations/3 girls, and 9 observations/3 boys).

Pain behaviors	**Boys**	**Girls**
Body movements		
Immobile	24	34
Withdrawing affected extremity	12	-
Tightly holding forehead	6	-
Generalized shivering	5	19
Trying to hold nurse's hand	2	3
Tightly holding stretcher	-	3
Kicking	-	7
Moving head side to side	-	4
Shaking hands	-	-
Biting own hand	-	1
Biting nurse's hand	-	1
Total	49	72

(Table 5 continued: Frequency of Pain Behaviors Exhibited by Boys and Girls)

Facial expressions	**Boys**	**Girls**
Looking at own wound	37	12
Grimacing	26	7
Wrinkled forehead	6	4
Widely opened mouth	2	-
Staring	1	10
Tightly shut eyes	-	10
Tightly shut teeth	-	5
Blinking	-	2
Total	72	50

The most frequent facial expression for boys and girls was looking at own wound. Grimacing (26) came second for boys and staring (10) was second for girls. Girls used seven different facial expressions to express their pain and boys used only five but they exhibited more facial expressions than girls.

(Table 5 continued: Frequency of Pain Behaviors Exhibited by Boys and Girls)

Verbalizations	**Boys**	**Girls**
Ay!	23	13
No mas (No more)	12	1
Hagame pasito (Do it smoothly)	7	15
Ayayayay!	6	21
Me duele (It hurts)	4	4
No!	2	6
Yo soy macho (I´m macho)	2	-
Mami, mami	1	15
No me haga duro (Don´t do it hard)	-	5
Total	57	80
Vocalizations		
Crying	20	45
Screaming	2	39
Total	22	84

Girls used 80 verbalizations to communicate their pain during the wound care and boys used 57. See Table 5 for more information. Girls used almost two times

more verbalizations and vocalizations than boys. Crying was more used by both sexes than screaming.

Pattern of Pain Behaviors by Age

The data from 16 observations of two younger children (3 and 4 years old) and two older children (6 years old) was analyzed to find the differences between younger and older children.

The younger children demonstrated less pain behaviors than older children. However, the younger children were restrained during four observations while none of the older children were restrained. The younger children showed 84 verbalizations, 69 vocalizations, 53 body movements, and 32 facial expressions. Table 6 includes the frequency of the specific behaviors demonstrated by the younger and older children. Generalized shivering (19) was the most frequent body movement exhibited by the younger children followed by immobility (12) and kicking (8). Staring (18) was their most common facial expression. Saying "ayayayay!" (27), "ay" (17), and calling their mothers (15) were the verbalizations more used by the younger children. Screaming (37) was more frequent than crying (32) for the younger children.

Table 6

Frequency of Pain Behaviors by Age (N=16 observations, 4 subjects)

Behaviors	Younger Children	Older Children
Body movements		
Generalized shivering	19	5
Immobile	12	30
Tightly holding forehead	-	6
Tightly holding stretcher	-	4
Kicking	8	-
Trying to hold nurse's hand	4	3
Moving head side to side	4	-
Shaking hands	4	-
Biting own hand	1	-
Biting nurse's hand	1	-
Total	53	48

(Table 6 continued: Frequency of Pain Behaviors by Age)

Facial expressions	**Younger Children**	**Older Children**
Staring	18	1
Tightly shut eyes	7	3
Tightly shut teeth	2	6
Grimacing	2	23
Blinking	2	-
Wrinkled forehead	1	6
Looking at own wound	0	30
Total	32	69
Verbalizations		
Ayayayay!	27	11
Ay!	17	22
Mami, mami	15	10
Hagame pasito (Do it smoothly)	10	11
No!	10	2
No me haga duro (Don't do it hard)	5	-
No mas (No more)	-	18
Me duele (It hurts)	-	5
Total	84	79

(Table 6 continued: Frequency of Pain Behaviors by Age)

Vocalizations	**Younger Children**	**Older Children**
Screaming	37	19
Crying	32	38
Total	69	57

The older children exhibited 253 pain behaviors: 79 verbalizations, 69 facial expressions, 57 vocalizations, and 48 body movements. Immobility (30), looking at own wound (30), saying "ay!" (22) and "No mas"/No more (18), and crying (38) were the pain behaviors mostly shown by the older children.

In summary, the children exhibited more verbalizations and less body movements as indicators of pain. Immobility, looking at own wound, saying "ay" and "ayayayay," and crying were the most frequently manifested behaviors by all the children. Girls predominantly exhibited verbalizations while boys predominantly showed facial expressions. Immobility was the most common body movement for both sexes. Looking at own wound was the most commonly exhibited facial expression for boys and staring for girls. Girls did more screaming than boys. Younger children as well as older children mostly utilized

verbalizations as behavior indicators of pain. Facial expressions were the behaviors less used by younger children, while body movements were the behaviors less exhibited by older children. Table 7 summarizes the pain behaviors exhibited by the children.

Table 7

Pain Behaviors Exhibited by the Children

Pain Behaviors	**Females**	**Males**	**Youngers**	**Olders**	**Total**
Body movements	80	50	53	48	231
Facial expressions	61	75	32	69	237
Verbalizations	130	62	84	79	355
Vocalizations	106	28	9	57	200
Total	377	215	178	253	1023

Individual Case Reports

The following description of each subject's profile and data will allow an individualized assessment of the behavioral response exhibited by the children during the painful event.

Patient #1. A four year old girl with 18%, second degree burns on her thorax and right arm caused by hot

water. She was admitted to the hospital after two weeks of ambulatory care when her wounds became infected with pseudomones. She was recruited to the study during the first week of hospitalization and third week postburn. She complained of pain in her back and right arm most of the time but she did not receive any analgesics. She ate and slept well. During the wound care, she became very upset. There was need to restrain her in order to get the care done. Everyday as soon as she was told that she would have the bath and dressing change, she cried and begged the nurses to do nothing to her because while she was at home "mami did not wash her nor she changed the dressing." At times, during the wound care, she asked the researcher to hold her hand and stay with her. After the wound care, she stayed in bed even though she was able to walk. She did not like the other children around her and she did not participate in play activities. Occasionally she talked to the researcher.

She exhibited 132 of the selected pain behaviors. Table 8 shows the specific behaviors exhibited by her.

Table 8

Specific Pain Behaviors Exhibited by Patient #1

Pain behaviors	Observation				
	1st	2nd	3rd	4th	Total
Body movements					
Kicking	1	4	2	-	7
Moving head side to side	-	2	1	-	3
Trying to hold nurse´s hand	1	1	2	-	4
Shaking hands	-	-	-	4	4
Biting own hand	1	-	-	-	1
Biting nurse´s hand	1	-	-	-	1
Total	4	7	5	4	20
Facial expressions					
Staring	-	1	2	5	8
Tightly shut eyes	1	2	2	-	5
Blinking	-	-	2	-	2
Grimacing	-	2	-	-	2
Wrinkled forehead	1	-	-	-	1
Total	2	5	6	5	18

(Table 8 continued: Specific Pain Behaviors Exhibited by Patient #1)

Pain behaviors	Observation				
	1st	2nd	3rd	4th	Total
Verbalizations					
Mami, mami	2	2	1	6	11
Ay!	-	3	1	6	10
Ayayayay!	-	-	5	5	10
Hagame pasito/ Do it smoothly	1	2	4	3	10
No!	3	3	-	-	6
No me haga duro/ Don´t do it hard	3	-	2	-	5
Me duele/It hurts	2	-	2	-	4
Total	11	10	15	20	56
Vocalizations					
Crying	4	5	4	6	19
Screaming	4	5	4	6	19
Total	8	10	8	12	38

Patient #2. A 6-year, 9-month old girl with second and third degree burns over 45% of her body. The burns were localized on her legs, abdomen, and lower back. She was admitted to the study during the fifth week postburn and hospitalization. She was in isolation for four weeks prior to the study, when her

wounds became infected with pseudomones. She was irritable and withdrawn most of the time. She had poor appetite and sometimes she vomited after eating breakfast or lunch. During the last two weeks of the study, she often called the nurse to her bedside and asked the nurse to feed her, to arrange the bed sheets, or to place her legs in another position. She seemed to accept the wound care with resignation and she cooperated with the nurses during the procedure. After grafting her wounds, she was able to walk with help, but was afraid of doing so by herself.

She showed 137 pain behaviors that are presented in Table 9.

Table 9

Pain Behaviors Exhibited by Patient #2

Pain behaviors	**Observation**				
	1st	**2nd**	**3rd**	**4th**	**Total**
Body movements					
Immobile	10	12	-	-	22
Trying to hold nurse's hand	-	-	-	3	3
Tightly holding stretcher	-	-	3	-	3
Total	10	12	3	3	28

(Table 9 continued: Pain Behaviors Exhibited by Patient #2)

Pain behaviors	Observation				
	1st	2nd	3rd	4th	Total
Facial expressions					
Looking at own wound	5	6	1	-	12
Tightly shut teeth	-	-	3	3	6
Grimacing	2	-	3	-	5
Wrinkled forehead	3	1	-	-	4
Tightly shut eyes	-	-	3	-	3
Total	10	7	10	3	30
Verbalizations					
Hagame pasito/ Do it smoothly	3	1	2	3	9
Mami, mami	-	-	6	2	8
Ay!	3	3	-	2	8
Ayayayay!	-	-	3	2	5
No mas/No more	-	-	1	4	5
Me duele/It hurts	-	3	-	1	4
Senorita, hagame pasito/Miss, do it smoothly	-	-	-	2	2
No!	-	1	-	-	1
Total	6	8	12	16	42

(Table 9 continued: Pain Behaviors Exhibited by Patient #2)

Pain behaviors	Observation				
	1st	2nd	3rd	4th	Total
Vocalizations					
Crying	4	8	6	4	22
Screaming	3	3	6	3	15
Total	7	11	12	7	37

Patient #3. A three year old girl with 21% second degree burns from hot water spilled on her when her mother was giving her a bath. The burns were located on the upper extremities, anterior thorax, and thighs. She was included in the study the first week postburn and hospitalization. During the wound care, she stood up immobile obeying nurse's orders. Her hands, feet, and the area around her mouth became very cyanotic and her entire body shivered. During the fourth observation there was need to restrain her legs. She had a very poor appetite after the second week of hospitalization but she seemed to sleep well. She showed 110 pain behaviors distributed as follows: 33 body movements, 32 verbalizations, 31 vocalizations, and 14 facial expressions. Table 10 includes her specific behaviors. Her most frequent behaviors were: generalized shivering, staring, saying Ayayayay!, and screaming.

Table 10

Pain Behaviors Exhibited by Patient #3

Pain behaviors	Observation				
	1st	2nd	3rd	4th	Total
Body movements					
Generalized shivering	9	10	-	-	19
Immobile	-	-	12	-	12
Kicking	-	-	-	2	2
Total	9	10	12	2	33
Facial expressions					
Staring	-	4	3	3	10
Tightly shut eyes	2	-	-	-	2
Tightly shut teeth	2	-	-	-	2
Total	4	4	3	3	14
Verbalizations					
Ayayayayay!	4	5	4	4	17
Ay!	-	-	3	4	7
Mami, mami	4	-	-	-	4
No!	-	-	-	4	4
My arm hurts	-	-	3	-	3
Total	8	5	10	12	35

(Table 10 continued: Pain Behaviors Exhibited by Patient #3)

Pain behaviors	Observation				
	1st	2nd	3rd	4th	Total
Vocalizations					
Screaming	5	4	5	4	18
Crying	5	4	4	-	13
Total	10	8	9	4	31

Patient #4. A four-year old boy with 18%, second degree burns on his right arm, anterior neck, and part of anterior thorax. He was included in the study at the fourth week postburn and hospitalization. During the wound care, he was quiet and followed the nurse's instructions. After the wound care, he played with other children, assuming the leading role. He did not have eating or sleeping problems. Occasionally, he asked the nurses when he would be able to go home. He blamed his mother for this burn because she accidentally spilled hot water over him in the kitchen. He told the researcher he would not go with his mother to the kitchen because he feared she will burn him again. He recovered very well and went home with a very small wound on his arm.

He exhibited 36 pain behaviors distributed as

follows: 19 facial expressions, 13 body movements, 2 vocalizations, and 2 verbalizations. Table 11 includes his behaviors.

Table 11

Pain Behaviors Exhibited by Patient #4

Pain behaviors	**Observation**			
	1st	**2nd**	**3rd**	**Total**
Body movements				
Withdrawing affected extremity	4	8	-	12
Trying to hold nurse's hands	1	-	-	1
Total	5	8	-	13
Facial expressions				
Looking at own wound	3	3	3	9
Grimacing	1	-	5	6
Wrinkled forehead	-	2	-	2
Widely opened mouth	2	-	-	2
Total	5	8	-	13
Verbalizations: None.				
Vocalizations				
Crying	2	-	-	2

Patient #5. A six-year old boy with 20%, second and third degree burns on both legs. He looked malnourished and pale at the beginning of the study. His appetite was very poor and his teeth were in very bad condition. After encouragement to eat and dental treatment, his appetite improved considerably with the consequent improvement of his nutritional status. He was very talkative with the researcher. His favorite topics were his father's job and his family. During the wound care, he was cooperative and in general followed the nurse's instructions. After grafting his wounds, he started walking and playing with other children. One day, he asked the researcher to take pictures of him.

He showed 116 pain behaviors, which are presented in Table 12.

Table 12

Pain Behaviors Exhibited by Patient #5

Pain behaviors	Observation				
	1st	2nd	3rd	4th	Total
Body movements					
Immobile	8	-	-	-	8
Tightly holding forehead	-	6	-	-	6
Generalized shivering	-	-	5	-	5
Tightly holding stretcher	-	-	-	1	1
Total	8	6	5	1	20
Facial expressions					
Looking at own wound	3	8	7	-	18
Grimacing	3	5	7	3	18
Wrinkled forehead	-	-	2	-	2
Staring	1	-	-	-	1
Total	7	13	16	3	39

(Table 12 continued: Pain Behaviors Exhibited by Patient #5)

Pain behaviors	Observation				
	1st	2nd	3rd	4th	Total
Verbalizations					
Ay!	1	11	-	2	14
No mas/No more	1	10	-	2	13
Ayayayay!	2	4	-	-	6
Mami, mami	1	-	-	1	2
No!	-	1	-	-	1
Me duele/It hurts	-	1	-	-	1
Total	5	27	-	5	37
Vocalizations					
Crying	1	10	1	4	16
Screaming	-	2	-	2	4
Total	1	12	1	6	20

Patient #6. A four year old boy who suffered 15% second degree burns on his face, right arm, and part of anterior thorax caused by gasoline fire. He was included in the study at the third week of hospitalization. During the wound care, he followed the nurse's instructions and stood up with his hands on his back. He seemed shy and needed encouragement to

participate in play activities. After grafting, he went home with two small unhealed areas on the thorax.

Sixty pain behaviors were exhibited by him. Table 13 includes the behaviors and their frequency.

Table 13

Pain Behaviors Exhibited by Patient #6

Pain behaviors	Observation			
	1st	2nd	3rd	Total
Body movements				
Immobility	6	7	3	16
Trying to hold nurse's hand	-	1	-	1
Total	6	8	3	17
Facial expressions				
Looking at own wound	3	4	3	10
Grimacing	-	3	2	5
Wrinkled forehead	2	-	-	2
Total	5	7	5	17

(Table 13 continued: Pain Behaviors Exhibited by Patient #6)

Pain behaviors	Observation			
	1st	2nd	3rd	Total
Verbalizations				
Ay!	1	10	-	11
Hagame pasito/				
Do it smoothly	1	6	-	7
Yo soy macho/				
I´m macho	2	-	-	2
No me duele/				
It doesn´t hurt	1	-	-	1
Usted si hace pasito/You´re				
doing it smoothly	1	-	-	1
Total	6	16	-	22
Vocalizations				
Crying	-	5	1	6

Chapter V. Discussion

This section presents interpretations and inferences drawn from the findings in relation to the three questions addressed in the present study. The implications for practice, limitations of the study, and recommendations for future research are also presented.

In this study three main questions were addressed:

1) What are the body movements, facial expression, verbalizations, and vocalizations exhibited by Colombian pre-school age children during the daily wound care of their burned areas?
2) What are the differences between girls and boys in using the identified pain behaviors?
3) What are the differences between younger and older children in using the identified pain behaviors?

The findings of this study are not statistically significant due to the small sample size. However, these findings may have useful clinical implications for nurses in the management of children's pain during the daily wound care of their burned area.

1. Pain behaviors exhibited by pre-school age children.

The children exhibited 592 incidences of body movements, facial expressions, verbalizations, and vocalizations that had been defined as pain behaviors. The predominant behavior exhibited by all children was verbalization indicating that pre-school age children, in spite of a limited vocabulary, were able to communicate their pain using specific verbal statements. The verbalizations more commonly used were: "ay," "ayayayay," "hagame pasito" (Do it smoothly), "mami, mami,""no," "no mas" (No more), "Me duele" (It hurts), "No me haga duro" (Don't do it hard). In Colombia, the exclamations "ay" and "ayayayay" differ in meaning in the sense that the latter means the person is feeling a more intense and continuous pain while the former (ay) means the person is feeling a more sudden, quick and less intense pain. These two expressions are used by all people to denote the intensity and duration of their pain. They also use these expressions to control the continuity of the source of pain when it is inflicted on them such as in a painful medical procedure. These verbalizations are learned very early in life. The other verbalizations used by the children in this

study indicate that the children had identified special aspects of the wound care procedure that made it easier for them to tolerate the pain. They were also attempting to direct or guide the nurse by telling her how to do the procedure so that they could tolerate the pain better. This finding clearly shows the children's ability to differentiate or identify a qualitative aspect of an event. Flavel (1977) stated that identities and functions which form the pre-operational child's knowledge are qualitative rather than quantitative in nature; that is, they involve no sense of measurement or quantitative precision. For example, the child identifies that the wound care procedure hurts him, it does not matter how much it hurts. This may be an important fact to keep in mind when assessing pain in pre-schoolers since what is important to them is that they have pain, not how much pain they have.

Verbalizations such as "Do it smoothly" and "Don't do it hard" indicate the children were also able to see a functional relationship between the way the nurse did the procedure (smoothly, hard) and the amount of pain inflicted. It is important that nurses acknowledge the child's verbalizations as indicators of pain as well as attempts to control the

quality of their experience and how these verbalizations serve to provide the children with some control over the pain situation. This sense of power and control will help the children to continue developing their sense of autonomy and to master the situation (Thomas, 1979). A negative experience such as a painful event could contribute to the development of the child's ego-identity by providing him with a sense of being able to do something for himself (alleviating his pain by telling the nurse how to do the wound care) and by allowing him to develop the inner-focused aspect of his ego: "his own selfsameness and continuity in time" (Thomas, 1979, p. 263).

A total of 136 facial expressions were exhibited by the children. Looking at own wound was the most frequent followed by grimacing, staring, wrinkled forehead, tightly shut eyes, clenched teeth, blinking, and widely opened mouth. All children except 2 girls closely observed their wounds and what the nurse was doing during the wound care. This finding shows the concreteness of the pre-operational thought process of the pre-schooler. To understand what is happening to him/her, the child needs to see or witness the event step by step. By acknowledging

this fact and allowing the child to see and maybe participate in the procedure, nurses will be giving the child the opportunity to understand the situation and to have some control over it. Based on the gate control theory of pain, a decrease in anxiety and fear as well as a sense of control over the painful situation will result in a decrease in the child's pain.

Facial expressions are part of the visual channel of communication utilized by human beings to express or communicate their emotions; the face is a primary, clear, and precise signal system to express emotions (Ekman and Friesen, 1975). Fear of physical harm and suffering is the prevalent emotion felt during a painful event such as the wound care of a burned area. Facial expressions of emotions are universal but are influenced by the culture's specific display rules. For instance, anger will be experienced or caused by the same situation regardless of the individual's culture, but the individual's facial expression of anger will depend on how much his culture allows him to show anger. Researchers have found that preschool children know what the most common facial expressions look like, what they mean, what kind of situations elicit them (Ekman and Oster,

1982). One could assume then that pre-school age children are able to express their emotions through facial expressions but also that they have learned to control the expression of those emotions. Therefore, nurses should watch for children's facial expressions during a painful procedure in order to be able to assess the emotions experienced by the children. These emotions could be fear, pain, and sometimes anger.

Vocalizations were shown in third place by the children with a total of 134. Crying predominated over screaming maybe because the nurses did not allow the children to scream because "it makes them (the nurses) nervous." Crying is the first response of the human being upon being born. The biological functions of crying are: 1) to communicate to the organism itself and to others the presence of distress; 2) to motivate both the self and others to do something to reduce the crying to a level tolerable for the organism who cries and for the one who hears the cry (Tomkins, 1982). The crying shown by the children of this study could be considered to serve the above functions. Thus, nurses should not suppress this behavior in children suffering from pain.

Body movements were the least common behavioral response displayed by the children. Immobility was the most frequent body movement followed by generalized shivering, withdrawing affected extremity, trying to hold nurse's hands, kicking, tightly holding stretcher, moving head from side to side, tightly holding forehead, shaking hands, and biting own or nurse's hand. The children's immobility during the wound care may be related to the nurse continuously requesting the child to hold still in order to get the procedure done more quickly and with less pain. In the Colombian culture, children are taught to always obey and respect adult's instructions and requests. On the other hand, children who did not hold still were restrained. Other reasons for the children's immobility may be related to their fear of the procedure and the amount of pain it will inflict, as well as a response to pain since immobility prevents pain.

There was not a pattern of increasing or decreasing numbers or patterns of behaviors over time, although pain behaviors decreased considerably in all subjects after grafting of their wounds. This finding shows that the children did not habituate to the pain inflicted during the procedure. Katz,

Kellerman, and Siegel (1980) in their study of children's distress during bone marrow aspirations also found that children do not habituate to pain.

2. Differences by sex in the use of pain behaviors.

There were some differences in the frequency and type of behaviors shown by boys and girls. Girls used twice as many verbalizations whereas boys exhibited more facial expressions. Vocalizations were almost five times as frequent among girls. These findings may reflect the influence of the culture on the children's pain response. In the Colombian culture, male children are taught early in life to be strong and tough and not to show their emotions. By contrast, females are taught that it is all right for them to show their emotions and to complain when they are feeling pain. Therefore, it is a cultural expectation that boys will endure pain more than girls. Nurses as well as other health professionals and parents allow more pain complaints and pain behaviors in girls than in boys. Katz, Kellerman, and Siegel (1980), in a study of behavioral distress (pain included) in children undergoing bone marrow aspirations, found that females displayed higher levels of distress. However, in a similar

study done by Jay, Ozolins, Elliott, and Cadwell (1983), the differences between sexes were not statistically significant which might be due to a smaller sample size.

Patterns of socialization can also influence the development of sex-differentiated behavior patterns (Maccoby and Jacklin, 1974). Boys and girls may develop sex-role related cognitive standards for interpreting and responding to aggressive stimulation such as a burn care. Recent evidence from research, examining internal cognitive standards, has found that a number of sources are responsible for developing these standards and subsequent patterns of response. The sources are in the parents (Maccoby and Jacklin, 1974), the children themselves (Eron, 1980), peers (Asher, 1978), and television (Slaby and Quarfoth, 1980).

3. Differences by age in the use of pain behaviors.

Younger children displayed more protective and "aggressive" behaviors such as kicking, trying to hold nurse's hand, biting nurse's or own hand. Other body movements used were generalized shivering, immobility, moving head from side to side, and shaking hands. These results show that younger

children used more and diverse body movements than older children which is consistent with the findings of Katz et al. (1980) and Jay et al. (1983) who found that younger children exhibited their distress in more intense, overt, and motoric modes than older children. One reason for this pattern of behavior may be that younger children experienced more fear than older children. However, older children demonstrated more behaviors that show increased muscular rigidity such as voluntary immobility, tightly holding forehead, tightly holding stretcher, grimacing, tightly shut teeth, and wrinkled forehead. This finding may be another sign of the fear felt by the children. According to Izard (1978), a person feeling fear experiences a high degree of tension. One could conclude that fear is a common emotion among pre-school age children facing a painful procedure such as the wound care. For most people acute pain is likely to elicit fear that has an adaptive value because it increases the individual's vigilance and readiness to avoid the painful stimuli (Izard, 1978). This fear may also be due to the meaning the children give to the pain situation and to the characteristic fear of body mutilation felt by this age group. Katz, Kellerman, and Siegel (1980) found

a trend toward behavioral withdrawal and increased muscle tension in children aged 8 months to 6 years who had undergone bone marrow aspiration. Another reason for the increased use of diverse body movements by younger children could be the developmental difference in communicative skills of both groups. The 6 year-old children have greater ability to communicate with others by using spoken language than the 3 year-old children (Flavel, 1977). Therefore the older children can use language to communicate their pain while the younger children use more motoric modes to express their pain. The data presented on Table 6 supports the above developmental differences.

Nursing Implications

The findings of this study, despite the small sample size, could have significant implications on the nursing management of pre-school age children's pain.

Nurses need to be aware of the pain inflicted to the child during some nursing procedures such as the wound care of a burned area. Young children might think the inflicted pain is a punishment for a misdeed. Nurses need to be gentle and understanding with children undergoing painful procedures. When

assessing pain, nurses need to look for specific body movements, facial expressions, verbalizations, and vocalizations as indicators of pain. Once the nurses have identified the presence of pain, they must plan, execute, and evaluate measures to relieve the child's pain as a very crucial aspect of his/her nursing care. These measures could include behavioral techniques to decrease the child's anxiety and fear and to focus his/her attention on something different to the painful event. Administration of analgesics could be another pain relieving measure. However, the behavioral techniques should be used before giving the analgesics because children are afraid of medicines and dislike them.

During painful procedures, nurses may take into consideration the child's verbalizations and respond accordingly to give the child some feeling of control over the situation. Nurses may also allow the child to watch what is being done to her/him and maybe to participate in some way in the painful procedure in order to help the child understand the event and to decrease his/her fear and anxiety. When assessing the child's pain response, nurses need to be aware that there might be some differences between boys' and girls' behavioral responses to pain. Behavioral

responses to pain, even in the pre-school age child, are influenced by the child's cultural background.

Finally, nurses need to understand that children do not habituate to pain regardless of their age, sex, or cultural background. Therefore, nurses might not expect less pain behaviors over time when the child has been experiencing pain for a long period of time as in the case of burns.

Limitations of the Study

The findings of this study are influenced by the following limitations:

1. The complex and subjective nature of the pain phenomenon itself makes its study limited and somehow biased, especially when only a selected aspect is investigated.
2. The lack of valid and reliable tools to assess pain in pre-school age children makes the assessment of the pain response more difficult. Yet, the changing nature of the pain experience itself makes it difficult to establish reliability in tools.
3. The use of a tool (behavioral check list) whose validity and reliability have not been tested by other researchers may limit the validity and generability of the findings.

4. The use of the time-sampling technique to collect the data may result in loss of information (behaviors) exhibited during the recording period. However, the behaviors were frequently exhibited by the children which assures that the behaviors will not go unrecorded.
5. The use of one observer (the researcher) provides consistency in data collection but systematic error and/or bias may occur when only one observer is collecting the data.
6. The Hawthorne effect resulting from the observer's presence near the children may have influenced the children's behavior. However, the children were absorbed by the painful procedure in such a way that they ignored the observer.
7. The behavioral check list included 26 behaviors. At times it was difficult to record all the exhibited behaviors in a 10-second period. This problem potentially decreased the accuracy and reliability of the data collected and findings of the study.

Suggested Areas for Future Research

Pain perception and response in pre-school age children have been studied very little, which calls for research in specific and general aspects of the phenomenon. In order to validate the findings of this study and to enhance the knowledge about pre-school age children's pain experience, the following areas are suggested for future research:

1. Replication of the present study with a larger sample, different cultural background, and different pain situations.
2. Pre-school age children's beliefs and perception of pain as well as their coping strategies with pain.
3. Parents and health professionals attitudes toward pre-school age children's pain and how it influences the assessment and management of the children's pain.
4. Relationships between behavioral and physiological responses to pain and children's self-assessment of their pain intensity.

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Behavioral Check List

Observation # _____ Child's name: _____

Observed behaviors		Comments	Codification system
Category	Code		Body movements 01. Kicking 02. Tightly holding stretcher 03. Tightly holding forehead 04. Moving head side to side 05. Signaling outside of room 06. Biting own hand 07. Shaking hands 08. Trying to hold nurse's hand Facial expressions 09. Tightly shut eyes 10. Staring 11. Wrinkled forehead 12. Grimacing 13. Biting lower lip 14. Tightly shut teeth 15. Looking at own wound Verbalizations 16. Ay! 17. Ayayayay! 18. Ya?/Is it over? 19. Mami, mami! 20. Papi, papi! 21. No! 22. Señorita, hagame pasito/ Miss, do it smoothly 23. Hagame pasito/Do it smoothly 24. No mas/No more Vocalizations 25. Crying 26. Screaming
Body movements			
Facial expressions			
Verbalizations			
Vocalizations			

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