Increasing parental knowledge in treatment of childhood fever

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INCREASING PARENTAL KNOWLEDGE IN TREATMENT OF CHILDHOOD FEVER

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ABSTRACT

Increasing Parental Knowledge in the Treatment of Childhood Fever

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Fever is the single most common symptom that causes parents to seek medical attention for their young children (Kramer, Naimark, & Leduc, 1985). Parental lack of knowledge regarding the management of pediatric fever plays a roll in this phenomenon. The problem addressed in this study is inappropriate parental usage of emergency treatment resources for the treatment of non-emergent childhood fevers. This study tested if providing direct and indirect information about childhood fever and its treatment resulted in a decrease of inappropriate emergency room visits for non-emergent pediatric febrile illnesses for a select population.

A quasi-experimental design was used with a control and a treatment group. The Neuman Systems Model (1989) for nursing provided the theoretical base for this study.

There was no significant change in the number of visits between the two groups, however, the participants that had read the educational handout had inappropriate
emergent visits 25% of the time while those that did not read the handout had inappropriate visits nearly 80% of the time.

Results of this study suggest that when parents are provided accurate information about pediatric fevers, they are less likely to seek emergent care for their child inappropriately.
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CHAPTER I

INTRODUCTION

Fever is the single most common symptom that causes parents to seek medical attention for their young children (Kramer, Naimark, & Leduc, 1985). Studies have shown parents lack of knowledge regarding treatment of their child’s fever results in their choice of inappropriate management strategies (Kelly, Morin, & Young, 1996).

When their child is observed to have a fever, informed parents have home treatment options available to them as well as non-emergent treatment facilities. In many instances it is appropriate to treat a child’s fever at home for 24 hours before seeking professional guidance (Johnson, 1996). However, many parents will use an emergency room service even though it is not warranted. The cost associated with utilizing a primary care provider or a “Quick Care” in the Las Vegas Valley, as compared to an emergency room, is one fifth to one third of the cost of even the least expensive emergency room cost. A visit to a county funded Quick Care costs approximately $80.00 while the emergency room at Mike O’Callaghan Federal Hospital charges an all inclusive fee of $210.00. Another local pediatric emergency room charges a base fee of $151.00; this is exclusive of any tests. The Oregonian (2000) puts the cost of emergency room visits between “$80 and $200 for something as simple as a cold.” The Kansas State Collegian
states the base cost of an emergency room is "$75 and is two to three times more
expensive than care provided at a scheduled appointment" (Eckert, 1998).

The problem addressed in this study is inappropriate usage of emergency
treatment resources by parents for the treatment of non-emergent fevers in their children.
This inappropriate allocation of emergency resources culminates in longer waiting times
in emergency rooms, increased expenditures for healthcare, and more nursing and
provider time consumed by non-urgent medical problems. Therefore, by eliminating or
even reducing the number of emergency room visits for non-urgent childhood fevers, cost
would decrease, waiting times for patients would be shortened, and the staff would be
able to attend to urgent/emergent issues without having to devote staffing and time to the
non-urgent child with a fever. The purpose of this study was to test if providing parents
information on when to use and not to use emergency services for their child’s febrile
illness would result in a reduction in inappropriate emergency room visits for a select
population and site.

Target clients were those eligible to seek treatment for their febrile child at a
military facility in the South West area of the United States. Consequently, sources of
information could be more easily controlled than with the general population with a
similar treatment need.
CHAPTER II

LITERATURE REVIEW

This chapter briefly describes the pathophysiology and the complications of fever, the current literature as it addresses the debate over reduction, management and treatment of childhood fever, parental knowledge of treating fever, and "fever phobia." It is proposed that in order to decrease the number of non-emergent visits to the emergency room for fevers, parents need to understand when a fever should be reduced, how to succeed in reducing the fever, and which methods are superior for reducing the fever. It is also believed that parental fear of fever in their child results in visits to emergency departments before using other more appropriate and less costly options for fever reduction. All of these areas must be addressed and explained to the parents in order to expand their understanding of childhood fever and when a fever warrants an emergency room visit. By educating parents, it is hypothesized, that inappropriate visits to emergency departments will decrease.

Pathophysiology

Fever is a normal immunological response to infection (Nelson, 1998) and is often considered "...to be beneficial to normal individuals because of the facilitating effect of increased body temperature on immune responsiveness" (Kilmon, 1987, p. 400). The
majority of fevers in infants and children are caused by viral illnesses which resolve spontaneously in a brief time period (Kilmon, 1987).

Since fever is the most common condition that causes parents to seek medical attention for their child (Kramer, Naimark, & Leduc, 1985), it is necessary to understand how and why a fever occurs. It is an integrated cascade of behavioral, neurological and endocrine responses to an immune challenge (Huether & McCance, 1998). Fever, in both adults and children, is very often a response to an infection, be it viral, bacteria, and/or fungal. Other less frequent causes may be vaccines, tumors, trauma, as well as exercise, warm clothing, anxiety, or elevated environmental temperature. Fever in adults and children, as defined in textbooks, is a rectal temperature of 100.4 F (38 C) (Hay, Groothuis, Hayward, & Levin, 1997; Burns, Brady, Dunn, & Starr, 2000).

Body temperature is regulated by the hypothalamus to maintain core body temperature at a normal level, which is considered to be 98.6 F (37 C), but is subject to diurnal and individual factors that cause fluctuation. During fever, the “normal level” is raised so that the thermoregulatory centers adjust the production, conservation, and loss of heat in order to maintain the core temperature at the new, higher temperature (Huether & McCance, 1998). “Prostaglandin, ...a potent hormone like unsaturated fatty acid...” (Anderson & Anderson, 1990, p. 730) acts to reset the heat regulatory set point, which maintains the body at a normal temperature level, leading to constriction of the blood vessels, heat production, and a rise in temperature (Berhaman, 1992). A negative-feedback loop helps to diminish the febrile response and explains the reason for the fluctuations of the temperature. When the fever “breaks”, the set point returns to normal
and the hypothalamus acts to decrease heat production. This results in decreased muscle
tone, peripheral vasodilatation, and perspiration (Huether & McCance, 1998).

Fever less than 104 F (40 C), that most children get, are not considered harmful (Schmitt, 1993). Drwal-Klien & Phelps (1992) assert that fevers of ≤105.8 (40 F) are relatively harmless as do Done (1983) and Dubois (1949). Shann (1991) states that fever is only harmful if the temperature rises above 41 C. Fevers ≤ 104 F. may cause discomfort due to chills and mild dehydration if the child does not receive adequate fluids to counteract the increased fluid loss due to sweating (Kilmon, 1987).

Febrile seizures can occur at temperatures above 102.2 F (39 C), but are usually brief and self-limiting, and appear to have no long-term effect (Huether & McCance, 1998). The seizures are caused not so much by the fever but by the rapid rise in temperature, often at the beginning of an illness (Drwal-Klien & Phelps, 1992; Kenna, 1994). Experts disagree as to the temperature required to cause brain damage. Huether & McCance (1998), were the most conservative citing the lowest temperature (104.9 F 40.5 C), which left untreated, could result in brain damage and/or death. Other medical experts, as listed earlier in this paragraph, are not as conservative.

Fever Reduction Debate

History

Throughout history, fever has been regarded in both a positive and a negative light. Fever was utilized as a clinical sign even before Hippocrates (Zitelli 1991). In the 14th century, during the Black Plague, and in the 15th century, during the Great Plague, fever was considered a prelude to death (Keage, 1999). Until the mid-nineteenth century,
fever was viewed as a healthy response to infection (Kramer et al., 1985). This view changed in the wake of experiments by the French physiologist, Claude Bernard, who demonstrated in 1876 that animals died when their body temperature was raised 5 to 6 degrees C above normal (Kramer et al., 1985). No duplicated findings of this study were found in the literature. More recent experiments in animals (Kluger, 1979; Kluger, 1975; Covert & Reynolds, 1977; Vaughn & Kluger, 1977) and humans (Ellingson & Clark, 1942; Mandel, 1975; Sebag & Reed, 1977; Roberts & Steigbigel, 1977) do not support the current fear of fever but suggest that fever can be beneficial when the body is fighting an infection (Kramer et al., 1985).

Recent Thinking

Over the past 20 to 30 years, the value of a moderate fever (<104 F, 40 C) has been re-discovered. Fevers "...between 99 F and 101 F are extremely common in young children, and frequently do not require treatment" (Stegelman, 1999, p. 52). Many authorities believe that a moderate fever is beneficial since it increases the host's response to infection thus increasing the survival rate (Duff, 1986; Kluger, 1992; Kramer et al., 1985; Kenna, 1994). Current literature is supportive that a fever is beneficial because the immune response is enhanced (Keagle, 1999; Kluger, 1992; Nizet et al., 1994). “The release of IL-1 stimulates lymphocytes, which induce proliferation of B cells, activate T cells, and increase antibody production... prompt release of helper T cells and antibody-producing B lymphocytes”(Keagle, 1999, p. 42). The increased immune response results in a more effective assault on the infecting organism. The increased heat can also destroy or slow the growth of invading microorganisms that are best suited to survive at specific
temperature ranges. Serum iron levels, which some microorganisms require as a growth factor, are also diminished with temperature elevations (Keagle, 1999).

There are, however, some who are not convinced that fever is beneficial. “Despite considerable speculation, it has not been definitely shown that fever is beneficial” (Adam & Stankov, 1994, p. 395). According to Adam and Stankov, three studies failed to establish a consistent relationship between temperature and antimicrobial activity. This was the only article found that was not convinced that a mild to moderate fever is usually beneficial. They did, however, agree that “several studies have shown an increase in the in-vitro activity of antimicrobial agents against both Gram-positive cocci and Gram-negative bacteria as the temperature was increased within the physiological range” (Adam & Stankov, 1994).

Fever Management

Despite the controversy surrounding the treatment of fever, both nonpharmacologic and pharmacologic measures are used to manage fever. They range from simple symptomatic treatments to giving antipyretics. These measures and how beneficial they are, are described below.

Nonpharmacologic Measures

Unwrapping – Removal of heavy clothing or blankets will enhance dissipation of the child's body heat by exposing the skin to increased air circulation.

Environment – Maintaining an environmental temperature of 70 to 72 F (21 to 22 C) will enhance conduction of body heat (Drwal-Klien, Phelps, 1992).
Warm Sponging – Sponging a child in a bathtub with 1 – 2 inches of warm water (100 F) increases evaporation thus promoting heat loss. Sponging does not change the set point of the hypothalamus. Body temperature has been shown to rise after sponging is discontinued (Adam & Stankov, 1994).

Rest – Vigorous activity should be discouraged as it generates body heat.  

Hydration – Increasing fluid intake will replace the fluids lost through sweating which will maintain blood flow necessary for heat dispensation.

Drwal-Klein and Phelps (1992) recommend that all of the above measures be taken, with the exception of sponging, before antipyretic therapy is begun. They support the use of sponging only after initiating antipyretic therapy due to the rise in temperature after the discontinuation of sponging, in addition sponging may increase the discomfort of the child as the child will feel cold.

Pharmacologic Measures

Aspirin was popular until the mid 1970’s when an association between it and Reyes syndrome was discovered (Lovejoy, 1978). As an alternative, acetaminophen (Tylenol) and ibuprofen (Motrin) are the two most common agents used in children to decrease the set point temperature of the hypothalamus (Keagle, 1999). Acetaminophen’s antipyretic effect is believed to result from its ability to decrease the synthesis of prostaglandin in the brain (Drwal-Klien & Phelps, 1992). As previously stated, prostaglandin acts to reset the heat regulatory set point, which maintains the body at a normal temperature level, leading to constriction of the blood vessels, heat production, and a rise in temperature (Berhaman, 1992). The dosage for children is 10-15 mg/kg
every 4-6 hours with a maximum of 5 doses in a 24 hour period (Brady, Burns, Dunn, & Starr, 2000).

Ibuprofen inhibits peripheral prostaglandin as well as central prostaglandin and therefore has anti-inflammatory as well as antipyretic activity (Ddral-Klien & Phelps, 1992). Ibuprofen was approved by the FDA in 1989 for use in children greater than 6 months of age. The dosage for a child is 5-10mg/kg every 6-8 hours with a maximum of 40 milligrams per kg per dose (Brady, Burns, Dunn, & Starr, 2000).

Most efficacy studies using ibuprofen and acetaminophen have shown no difference between the two in terms of rate, degree, or duration of temperature reduction. Both are effective at the above recommended dosages (Ddral-Klien & Phelps, 1992).

Parental Factors

It is understandable that parents want to reduce the discomfort their child experiences with a fever such as chills and feeling ill. However, "discomfort with fever usually does not occur until the fever reaches 103 – 104 F (39.5 – 40 C)" (Schmitt, 1980, p. 178).

Parents have misconceptions in regards to their understanding and treatment of fever. Casey et al. (1984) in a prospective controlled trial of an educational intervention discovered that seventy-five percent of the 106 parents studied could not accurately define fever. Sixty-eight percent did not know the temperature at which harm could occur to the child. Seventy percent did not know when to start antipyretic therapy. The majority did not know the correct antipyretic dosage, frequency for checking temperatures, nor when to give subsequent doses (Casey et al., 1984). Studies by Schmitt (1980) and
Kramer et al. (1985) found that approximately half of the 302 parents surveyed considered temperatures below 100.4 F (38 F) to be fevers. More than one third of the parents believed that if left untreated, a fever could rise to 107.6 F (42 C) (Schmitt, 1980). The greatest parental fear was that elevated temperatures would cause brain damage. Approximately twenty-five percent of the parents believed brain damage could occur at temperatures less than 104 F (40.0 C) (Schmitt, 1980; Kramer et al., 1985). As previously mentioned, Huether & McCance (1998), were the most conservative citing 104.9 F (40.5) as the lowest temperature 104.9 F (40.5 C), which if left untreated, could result in brain damage and/or death.

Dosing Medication by Parent

The ability of parents to give the correct dosage of antipyretic is also a concern. In a study of 100 caregivers, in which 87% had high school education or greater, only 30% were able to determine and measure the correct amount of acetaminophen for their child. This was despite being given the opportunity to read the package labeling and having at least a high school education. Most of the dosing by these parents was sub-therapeutic, however, 9% of the caregivers overdosed the medication but none were in the toxic range (Simon & Weinkle, 1997). In another study that looked at parental dosing, Kapasi et al., (1980) discovered that 53% of the 249 parents surveyed did not believe that an overdose of acetaminophen could be lethal and 22% would use aspirin as their first choice of antipyretic for their child.
Parent’s Fever Phobia

Fear of fever (fever phobia) is common among American parents (Kelly, Morin, & Young, 1996). It was first defined by Schmitt (1980) as the unrealistic parental fear of their child’s acute low grade fever that most children experience repeatedly. Schmitt discovered in a convenience study of 100 parents who brought their children to a university-based walk-in clinic, "58% of parents consider fevers of 38.9 C (102 F) or less to be 'high fevers'...that 94% of all parents believe fever can cause side-effects, and 62% believe it can cause permanent harm, the most common concern being brain damage" (Schmitt, 1980, p. 177).

Kelly, Morin, and Young (1996) conducted a descriptive, comparative study with a convenience sample and surveyed 86 caretakers of children between the age of two months and five years from a suburban pediatric practice, a suburban primary health care center, and three inner-city primary health care centers. Despite the frequent occurrence of fever, especially in preschoolers, parents often became anxious for their child’s welfare and demonstrate a lack of understanding in effective fever management (Kelly, Morin, & Young, 1996). This combination of anxiety and knowledge deficit often results in a visit to the local emergency room (Nelson, 1998). A large part of fever phobia is anxiety and this anxiety is a result of lack of knowledge (Keagle, 1999). Keagle concluded education of parents is essential to reduce excessive use of health care services by uninformed parents.

Emergency Room Visits and Fever

A retrospective study of records of 874 pediatric visits from one week each of...
spring, summer, fall, and winter, at two Boston emergency departments, one a general emergency department and one a pediatric emergency department, found that fever was ranked third as the chief complaint (Fleisher, Nelson, & Walsh, 1992). Injury was ranked first followed by a miscellaneous category at both hospitals (Fleisher, Nelson, & Walsh, 1992). During the winter, fever accounted for 20% of the visits in the general emergency department (Fleisher, Nelson, & Walsh, 1992). The CDC ranked fever as the third most common reason for emergency room visits nationally, preceded by abdominal pain and chest pain (McCraig, 2000). In a prospective study to evaluate caregiver use of over-the-counter medications, 100 caregivers of a representative sample of children with nonemergent chief complaints from an Atlanta emergency department were approached to participate in the study. It was discovered that approximately one half of the emergency room visits were for complaints of fever-related illnesses (Simon & Weinkle, 1997).

Timing of Educational Intervention

The lapse of time between the educational intervention and either a reinforcement of the education or evaluation of the educational intervention's effect varied from two weeks to six months. A study by Kelly, Morin, & Young (1996) used a two to four week time lapse after the educational intervention before the data collection was performed. The intervention by Kelly et al. (1996) did not result in a behavior change. Another study reinforced the original educational interview by mailing a printed summary of the original information provided, two months later during the data collection period which lasted four months (Casey, et al., 1984). Robinson et al. (1989) conducted posttest at two weeks, three months, and again at six months after the educational intervention. Casey et al.
(1984) and Robinson et al. (1989) found that an increase in knowledge as well as behavior changes, resulted from the intervention of an educational tool.

Summary

This chapter has defined and examined the physical process of fever, the need for parental education on managing childhood fever, how childhood fever is managed, and the effect it has on emergency rooms.

Because many parents fear the effects of fever, literature was reviewed to support the position that most experts agree that treatment of moderate fever is often not necessary and will not result in a negative outcome for a child (Keagle, 1999; Kenna, 1994; Kilmon, 1987; Kluger, 1992; Kramer et al., 1985; Nelson, 1998; Schmitt, 1980; Stegelman, 1999). Only Adam & Stankov (1993) questioned the benefit of untreated fevers but only would go so far as to say that the results have not been consistent and more study is needed.

In addressing why parents will use emergency services for non-urgent mild fevers, numerous articles address the lack of parental knowledge as the primary cause (Casey, 1984; Kapasi et al., 1980; Keagle, 1999; Kelly et al., 1996; Kramer et al., 1985; Nelson, 1998; Schmitt, 1980; Simon & Weinkle, 1997). Three studies found a lack of parental knowledge and the effectiveness in utilizing an educational tool to increase parental knowledge of the management of pediatric fevers (Casey, et al., 1984; Kelly et al., 1996; Robinson et al., 1989). The two older studies, Casey et al. (1984) and Robinson et al. (1989) found that an increase in knowledge as well as behavior changes, which included appropriate dosing of antipyretics and decreased number of inappropriate clinic visits,
resulted from the intervention of an educational tool. In contrast, Kelly et al., (1996) found the intervention did not result in a behavior change.

The limited number of studies found, the age of the studies, and the inconsistent findings of the research, supported the need for this study to determine the effectiveness of an educational intervention to elicit appropriate use of emergency room services by parents for their child's fever.
CHAPTER III

FRAMEWORK

Theoretical Framework

The Neuman Systems Model (1995) for nursing provides the theoretical base for this study. “A research survey identified nearly 100 studies conducted between 1989 and 1993 for which the model provided the organizing framework” (Freese et al., 1998). The sociocultural, developmental, and spiritual variables, while a part of the Neuman Model, are not addressed in this study. This study focused on how an educational program affects the physiological effect on the child in addition to the psychological stress to the parent. The model depicts the client system as a person or persons that are continually being affected by stressors both inside and outside the system. These stressors can have both a direct and indirect effect on the client’s ability to maintain optimal wellness. The client system is protected by a series of buffers that serve to protect the client and decrease the impact of the stressors. Neuman describes three types of buffers or levels of prevention; primary, secondary, and tertiary. See Appendix J for model diagram.

Interventions that involve primary prevention are those aimed at protecting the normal line of defense. This is accomplished by decreasing risk factors and expanding the flexible line of defense to withstand stressors. Primary prevention is utilized when a risk or hazard from a stressor is known but has not yet occurred. The result of primary
prevention is the prevention of the hazard from occurring or decreasing the impact when it does occur.

Secondary prevention deals with the use of appropriate treatment and interventions after a stressor has penetrated a normal line of defense. At this point, the stressor has caused symptoms in the client. The goal of secondary prevention is to strengthen the client's lines of resistance thus protecting the client's basic structure.

Tertiary prevention includes those interventions that assist the client in returning to a state of wellness following treatment. "The goal is to maintain an optimal wellness level by supporting existing strengths and conserving client energy" (Neuman, 1989, p. 37).

Nursing interventions, in this study an educational tool, were employed to reduce the effect of the stressor on the client. Pediatric fever is both a physical and emotional stressor to the family unit. Physical stress is a result of the physiological response that results in a child's febrile illness (Nizet, Vinci, & Lovejoy, 1994). When a child has a fever, the parents are emotionally stressed because they are overly concerned (Schmitt, 1980). Primary prevention nursing measures can reduce both the physical stress in the child and the emotional stress for the parent, by providing the parents with the knowledge to effectively treat a child's fever. Parents are often alarmed by a low grade fever 102 F (38.9 C), and believe that a moderate fever 104 F (40.0 C) can cause serious neurological damage (Schmitt, 1980). Parental fear of fever, "fever phobia", can cause parents to inappropriately manage a child's fever according to Schmitt. By knowing the symptoms of a true febrile emergency, and providing appropriate treatment for non-emergent fevers, the child will feel better and parental anxiety will be diminished (Casey, McMahon,
McCormick, Pasquariello, Zavod, and King, 1984). The educational tool was designed to increase the parents' knowledge of the treatment of fever which serves as primary prevention. As parental knowledge and knowledge of appropriate treatment of pediatric fever increases, the distance between the normal line of defense and the flexible line of defense is widened. The flexible line of defense is the outer boundary of the client and as it expands it provides more protection. This boundary acts as a buffer and is the first line of defense when a stressor is introduced from the environment. It protects the normal line of defense, in this case normal body temperature, which is the usual state of the client (Neuman, 1995).

Purpose

The purpose of this study was to test an educational tool designed to increase parental knowledge of when it is appropriate or necessary to seek emergent intervention for their child's febrile status.

Hypothesis

The number of inappropriate visits to the emergency room for non-urgent pediatric febrile illnesses will decrease after direct and indirect information (educational tool) regarding childhood fever and its treatment is provided to a select group of parents. If this hypothesis is true, the basic structure of the child will be strengthened, the parent's line of resistance will be strengthened, and primary prevention will occur as a result of the educational program. Kelly et al., (1996) reported mixed results with an educational program utilized in their study. In their study, the educational intervention was not
effective in terms of when to medicate a fever but was considered effective in improving the accuracy of the medication dosage. After education, dosage accuracy improved significantly (Kelly et al., 1996). After an audiovisual educational intervention designed to increase knowledge about fever in children, a thirty to thirty-five percent decrease in visits for fever resulted and the improvement in knowledge of fever persisted for nearly six months (Robinson et al., 1989). This study involved nearly 500 families that were randomly assigned to the control and experimental group.

Variables

The independent variable in this study was the educational tool that was given to all parents whose children were seen in the pediatric clinic six weeks prior to the data collection as well as an informative article on pediatric fever placed in the base newspaper. The educational tool was also displayed and available in the emergency room.

The dependent variable was the number of appropriate or inappropriate visits for pediatric fever during the selected time frame, compared to the same time period the previous year, before the use of the educational tool.

The anticipated extraneous variables were: cooperation of the staff to hand out the educational tool, educational level of parents, parental experience caring for children, military environment, accurate measurement of the child's temperature, extremes in the number of pediatric illnesses during the data collection period, and the ability of parents to adhere to and accurately follow the recommendations of the educational tool.
Definition of Terms

**Educational Information Tool.** An educational handout that provided information regarding when and how to treat pediatric fever, as well as the signs and symptoms that warrant a visit to the emergency room, was given to all parents with appointments, for any reason, in the Pediatric Clinic beginning six weeks prior to the start of data collection. An informative article with the same information was also placed in the base newspaper one week before the start of data collection (Appendix J).

**Visit to the Emergency Room.** This was defined by delineating the criteria of an appropriate visit. A visit to the emergency room was judged appropriate if the child met one or more of the following guidelines and inappropriate if none were met (Schmitt, 1984):

- The child is less than 3 months old and has a fever of 100.4 F (38.0 C).
- The fever is above 103 F (39.4 C).
- The child is crying inconsolably.
- The child is difficult to awaken.
- The child is confused or delirious.
- The child has a seizure.
- The child has a stiff neck.
- The child has purple spots on the skin.
- The child is having difficulty breathing even after the nose is cleared.
- The child is acting and looks very sick.
- The child has increased risk factors for serious infection (e.g., sickle cell)

The above criteria were adapted from Schmitt (1993,) who is recognized as a

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leading authority in pediatric fever and adjusted to meet the criteria of the Mike O'Callaghan Federal Hospital Emergency Room and Pediatrics which was more conservative (lower temperature) than Schmitt's recommendations. This lower temperature was taken from a study by Bonadio et al., (1991) in which 5.2% of children with a fever between 39 to 39.9 C had serious bacterial infections. "The rate of serious bacterial infections increased in direct proportion to fever height, (Bonadio et al., 1991).

**Fever.** In this study fever, which is a stressor, was defined as a rectal temperature of 100.4 F (38 C) or an oral temperature of 100.0 F (37.8 C) and above (Hay, Groothuis, Hayward, & Levin, 1997; Burns, Brady, Dunn, & Starr, 2000). The temperatures for the appropriate visit criteria (100.4 F for children less than three months old and 103 F for those over 3 months) were taken from the protocols of the emergency room at Mike O'Callaghan Federal Hospital.

**Environment.** It was defined as those forces surrounding the client, internal and external (Neuman, 1995). In this study, a military hospital was the environment where the research occurred. More specifically, the setting was the emergency room of the Mike O'Callaghan Federal Hospital where active duty military personnel, their dependents, retired military, and veterans are treated. The environment also included those factors that may influence the client, for example; advertising, experiences of family or friends, or previous personal fever experiences.

**Client.** Neuman's model (1995) describes the client as any system that interacts with the environment. Therefore, in this study, the client was the family, parent or parents, and the child.

**Normal Line of Defense.** The normal line of defense is the client's baseline, or
usual state of wellness (Neuman, 1995). In this study, the normal line of defense was stressed by the causative factor of the fever for the child. The parent’s normal line of defense was stressed by the child’s illness. The client’s baseline was not examined in the course of this research.

**Flexible Line of Defense.** The flexible line of defense is accordion-like and expands or contracts while surrounding and protecting the client’s normal line of defense (Neuman, 1989). It is the first line of defense in response to environmental stressors. The educational tool was hypothesized to enhance this line of defense for the parent by decreasing or eliminating fever phobia and the anxiety it produces.

**Basic Structure.** This inner circle contains the energy resources necessary for the survival of the client (Neuman, 1995). Thermoregulation would be contained within this circle.

**Lines of Resistance.** Closest to the basic structure, the purpose is to protect the basic structure’s integrity once a stressor has invaded beyond the normal line of defense (Neuman, 1995). The immune response, which includes fever, would be one line of resistance that relates to this study. Also enhancing the line of resistance was the previously described pharmacologic and non-pharmacologic measures to reduce the fever.

**Primary Prevention.** As defined by Betty Neuman (1995), primary prevention is interventions taken by nurses prior to a reaction from an environmental stressor to protect the client’s normal line of defense. The educational tool in this study was a primary intervention as it related to the prevention of misuse of the emergency room for pediatric fevers.
CHAPTER IV

METHODS AND PROCEDURES

In this chapter the research design, pilot study, sample setting, measurement methods, procedure, ethical considerations, and methodological limitations are discussed.

Research Design

A quasi-experimental design with two groups, treatment and control with a post-test was used for this study. The intervention was an educational tool that provided direct and indirect information to parents to increase their knowledge of when it is appropriate to seeking emergency care for their child’s fever. The measurement of the dependent variable was the number of visits to the emergency room for pediatric fever that were judged appropriate and inappropriate in the delineated time periods.

Population and Sample

Population

The target population consisted of all military health care eligible parents with children age seven and under. The accessible population included: active duty military members and their dependents as well as retired military personnel and their dependents.
who were eligible for care at the Mike O’Callaghan Federal Hospital (MOFH) emergency department. Access to this population was gained by obtaining approval from the Research Program Management Element, Davis Grant Medical Center, Travis AFB, CA in addition to the commander of the Nellis AFB hospital.

Sample

The subjects in this research study included the primary care giver and his/her child age seven and under, who came into the emergency department with a chief complaint of fever. The only qualification for the parent to be included in the study, was that his or her child had a chief complaint of fever. The appropriateness of the visit was determined by the previously outlined criteria.

All parents who brought their child into the emergency room for treatment of fever during the two time periods were included in the study. The control group data were obtained from the prior year’s records (2000) while the treatment group was obtained from the same time period but in the current year (2001). Participants in the current year were asked if they read either the informational handout or the article in the base newspaper. If yes, they were also asked if the handout provided any new information. The time frame of July first to August eighteenth was chosen for the data collection period after a review of the old records was completed. This time ensured a minimum sample of approximately 100 subjects for each time period. The sampling was convenience with all records that met the criteria being selected.

Intervention

The educational intervention involved giving the educational handout to all
parents who had their children seen in the Pediatric Clinic beginning six weeks before the
data collection. In addition, an article containing the same information was placed in the
weekly base newspaper one week prior to the start of the data collection period. The
educational tools explained when to seek emergency treatment for a child’s fever as well
as how to manage a non-emergent fever at home. The educational tool included
appropriate treatment of fever at home including pharmacological and nonpharmacological
measures as well as symptoms that would warrant a visit to the emergency room. A
display containing the educational information was also placed in the emergency room
waiting area during the same period. The newspaper article included much of the same
information (See appendix I)

The educational tool was written at the Flesch-Kincaid sixth grade level. The
Flesch-Kincaid reading scale was developed by Rudolf Flesch and J. P. Kincaid in 1975
based on research done with Navy enlisted personnel’s understanding of Navy training
manuals (Flesch, 1974). Since all military personnel have a minimum of a high school
education, at least one parent should be able to read the educational tool with ease.

The objective of this educational intervention was to assist parents in determining
when to seek emergent care for their feverish child. The educational tool provided
accurate information based on national standards to parents concerning the appropriate
treatment of pediatric fever. The educational information was gleaned from current
literature and reviewed by the Pediatricians and the nurse manager of the Pediatric Clinic.
This was done in order to help to ensure content appropriateness and accuracy. It was also
approved by the Institutional Review Board (IRB) at Travis Air Force Base. They
suggested adding a "pound" calculation on the educational handout and this was accomplished.

Tools

A demographic tool was developed by the investigator from a review of current literature to identify those independent variables that would be beneficial in identifying similarities and differences of the participating subjects. Items that were included: age of child, gender of child, number of children in the family, child's ordinal position among the siblings, race, parental education and rank of military member. The subject was also asked at this time if they gave the child any antipyretics and when they were given, as well as if they had received the informational handout or read the article in the base newspaper. If the parent did have access to the educational information, they were also asked if the educational handout provided any new information. Data obtained from this tool were nominal, ordinal, and interval.

The tool for assessing the effectiveness of the educational intervention was determined by identifying the number of appropriate and inappropriate visits during the post treatment data collection period and the same time frame from the previous year.

Determination of the appropriateness of the visit was made from the emergency room chart, known as Air Force Form 558. The criteria listed below have a letter or letters listed before them that correspond to a section on the 558 where the information can be found. The 558 form has contained the same sections, as described below, for the past four years. If any of these criteria were found on the 558, then the visit was determined to be an inappropriate visit. (See appendix E)
Section

A, D  The child is less than 3 months old and has a fever of 100.4 F (38.0 C).

D  The fever is above 103 F (39.4 C).

C, F  The child is crying inconsolably.

C, F  The child is difficult to awaken.

C, F  The child is confused or delirious.

C, E, F  The child has a seizure.

C, F  The child has a stiff neck.

C, F  The child has purple spots on the skin.

C, F  The child is having difficulty breathing even after the nose is cleared.

C, F  The child is acting and looks very sick.

C, F  The child has increased risk factors for serious infection (e.g., sickle cell).

These data are nominal. The validity and reliability of this data was dependent upon the thoroughness and accuracy of the nurses and doctors in the emergency room. Information that the nurse may have omitted in the original triage interview, may have been included by the doctor in section F and the reverse may also have been true and found in sections A, C, or D. This helped to strengthen the validity of the data since more than one person had the opportunity to include data that another may have neglected to include. Demographic information was obtained from the unit medical records.

Procedure

Emergency room charts, and statistical information for each month which includes the number of patients seen and the number of pediatric patients, was reviewed for the
past three years to determine a time period where the number of patients seen as well as the number of pediatric visits are comparable. Once the time frame of July first to August eighteenth was determined, the number of inappropriate visits for pediatric fever was tabulated using the criteria previously listed. This information was used to compare to the data collected after the implementation of the educational intervention.

Beginning six weeks prior to the current data collection period, a display was placed in the pediatric clinic and the educational tool was given to each parent that brought their child into the pediatric clinic. This continued through the data collection period. The six week time period was chosen after reviewing the literature (Casey, et al., 1984; Kelly et al., 1996; Robinson et al., 1989). During the same time period a display was placed in the emergency room waiting area with the educational handout available. An article with information on childhood fevers was also placed in the base newspaper one week prior to the start of the data collection period. This article described when a visit to the emergency room for pediatric fever is warranted and measures a parent can use to care for the child at home.

Data were gathered over a seven week period by the investigator from a review of the charts in order to obtain approximately 100 participants for each group. Demographic information was obtained from the 558. The subjects were questioned to determine if they had read the informational handout or read the article on fever that was published in the base newspaper. If they had read the handout, a "yes" was written in the upper right hand corner of the 558 and the second question to determine if the information provided was new to them was also asked. The "yes" or "no" response was then written underneath the original "yes". If they did not read the information, then a "no" was placed in the same
location of the 558. The appropriateness of the visit was determined by utilizing the aforementioned criteria and examining the 558 as explained in the tools section.

Cooperation of the staff was elicited via the investigator's attendance at a staff meeting. At least one of the parents had a minimum of a high school diploma. Measurement of the child's temperature was done by a baccalaureate prepared Registered Nurse either rectally or orally. Data from the three previous years was examined to determine the time frame that had similar numbers of pediatric visits to the emergency room. The education tool was reviewed by the nurse manager of the Pediatric Clinic, 4 Pediatricians, five graduate nursing students, and five parents to determine readability, ease of comprehension, and content validity. There was no control of the military environment which was relatively the same in the pre and post educational tool use period.

Statistical Analysis

Descriptive analyses using frequency distributions showing the number and percentage of appropriate/inappropriate visits, the age of the child, race, education/rank of the parent, the child's ordinal position among siblings if any exist, and the appropriate use of antipyretics were utilized. The data were also analyzed to determine if there was a relationship between the inappropriate use of the ER, use of antipyretics, and the parental experience of the caregiver as demonstrated by the ordinal position of the child being seen for fever.

The research hypothesis was tested with a Chi-square test utilizing raw data. The Chi-square test was appropriate because of the sample size, two possible outcomes and
two matched groups. Power analysis was done to determine the needed sample size to obtain a significant result. For a power of 0.8, a sample size of 93 was required for both the pre and post groups.

Pilot Study

The educational tool was given to five parents and five graduate nursing students to determine readability, comprehension, and clarity. At least one of the child's parents had a minimum of a high school education since this is a minimum requirement for military service. The five parents were questioned by the researcher to ascertain their understanding of the information and their opinion of the handout. The only revisions suggested/made was the dosage calculation using pounds and a suggestion of using colored paper for the handout. As previously mentioned, the educational handout was reviewed by the Pediatric staff at Mike O'Callaghan Federal Hospital and the IRB at Travis Air Force Base.

Human Subjects' Rights Approval

The study protocol was submitted for approval first to the members of the thesis committee, and subsequently to the Human Subjects’ Rights Committees of the Department of Nursing and the University of Nevada, Las Vegas IRB. Approval was also obtained from the Research Program Management Element, Davis Grant Medical Center, Travis AFB, CA and from the commander of the Mike O'Callaghan Federal Hospital. The IRB at Travis AFB determined that this was an exempt proposal meaning that
informed consent was not required (Appendix H) as did the Human Subjects' Rights Committee of the University of Nevada, Las Vegas.
CHAPTER V

FINDINGS

Introduction

This chapter presents results of data analyses as they relate to the appropriate / inappropriate visits to the emergency room for pediatric febrile illnesses. The study results are presented as follows: description of the sample which includes demographic characteristics of the parent / child, and the diagnoses of the child, total number of visits judged appropriate by year, Findings related to other variables; the age of the parent, military rank of parent, race, use of antipyretics, the child in the first ordinal position, the child is an only child, and by having read the educational tool are then presented.

Description of the Sample

The total number of participants in the study was 221. The control group was established from 353 pediatric visits for children age seven and younger from 1 July 2000 to 18 August 2000. Of these 353 medical records, 119 included a chief complaint of fever. The treatment group was drawn from a total of 336 eligible pediatric visits of which 106 included a chief complaint of fever. Four records of the treatment group were excluded because information was not gathered regarding the parents' access to the educational handout. This reduced the treatment group to a total of 102 participants.
Child Characteristics

Characteristics of the children were as follows: age range - one month to seven years, gender - female 41.6% (n = 92), male 58.4% (n = 129), temperature range - 96.0 F to 106.0 F, ordinal position - first ordinal 45.7% (n = 101), second position 29.0% (n = 64), third position 11.3% (n = 25), fourth position and higher was 4.1% (n = 9), number of siblings - zero siblings 45.7% (n = 101), one sibling 35.7% (n = 79), two siblings 13.6% (n = 30), three or more siblings 5.0% (n = 11).

The primary diagnoses of the children were as follows: otitis media 25.49%, febrile illness 21.57%, upper respiratory infection 14.71%, pharyngitis 10.78%, acute gastroenteritis and other each accounted for 7.84%, pneumonia/bronchitis 4.90%, viral syndrome 2.94%, conjunctivits 1.96%, and urinary tract infection and croup each accounted for 0.98%.

Parental Characteristics

Parental characteristics examined included the age of the parent which ranged from nineteen to fifty-one years of age with a mean age of 29.64 and a standard deviation of 6.675. The military rank of the parent ranged from E-1 (enlisted) to O-5 (officer). Enlisted accounted for 91.9% (n = 203) and Officers numbered 8.1% (n = 18). The race of the participants was as follows: Caucasian 45.7% (n = 101), African-American 13.1% (n = 29), Asian 10.0% (n = 22), Hispanic 9% (n = 20), other and unknown 20.8% (n = 46).
Comparison of Variables and Appropriate Visits

Appropriate Visits by Year

The number of appropriate visits, as determined by the criteria, for the control group was 25.2% (n = 30) and the treatment group had 31.4% (n = 32) appropriate visits (Table 1). The percentage of appropriate visits did increase but the difference between the two groups was not significant ($X^2 = 1.003$, df = 1, $p = .309$).

Appropriate Visits Versus Age of Parent

Appropriateness of visit as it related to the age of the parent was examined by dividing the parents into two groups; thirty years of age and under and over thirty. A division into two groups was made at the age where there appeared to be a separation of the frequencies. This resulted in 138 visits for the parents age thirty and younger, and 83 visits for those parents over thirty. To determine if any relationship existed between the age of the parent and appropriate visits, a frequency distribution was first examined. Thirty and under had 35.5% (n = 49) and over thirty had 15.7% (n = 13) appropriate visits. Pearson Chi-Square test and a two-tailed t-Test was used to examine this data. The Chi-Square test showed $X^2 = 10.112$, df = 1, $p = .001$ when the appropriateness of the visit was examined in relation to the parent's age (Table 2). The two-tailed t-Test revealed $t = -2.948$, df = 130.147, $p = .004$ (Table 3). Levene's test for equality of variances showed $p = .039$ implying that the variances were significantly different so equal variance could not be assumed. Both tests demonstrate that parental age is a predictor of an inappropriate visit.

Appropriate Visits Versus Age of Parent with Access to the Educational Tool

Appropriate visits and the age of the parents for those subjects who read the
educational tool (n = 20) showed that in this case also age was a predictor of appropriate visits. The two-tailed t-Test revealed that \( t = -3.210, \, df = 18, \, p = .005 \) (Table 4) and equal variances were assumed after being examined with the Levene test where \( F = .445 \) and \( p = .513 \).

**Appropriate Visits Versus Rank of Parents**

To determine the appropriateness of the visit in relation to the parent's rank, the parents were divided into two groups, enlisted and officers. Enlisted had 28.1% (n = 57) appropriate visits and the officers had 27.8% (n = 5). The Chi-Square test showed \( \chi^2 = .001, \, df = 1, \, p = .978 \) when rank was compared to appropriate visit (Table 5). Therefore, rank was not related to appropriate use of the emergency room for fever in children.

**Appropriate Visits Versus Rank of Parents with Access to the Educational Tool**

Appropriate visits in relation to the military rank of the parent for those parents that read the educational tool were examined using the Fisher's Exact Test since some of the cells had less than five subjects. \( P = 1.0 \) therefore rank was not a predictor of appropriate visits for those that read the educational tool. It also suggests that since the number of subjects was small, it may not allow for a stable reading.

**Appropriate Visits Versus Race**

Comparing race and appropriate visits revealed that Caucasians had 21.8% (n = 22) appropriate visits, African-Americans 48.3% (n = 14), Hispanics had 20.0% (n = 4), Asians had 36.4% (n = 8), and the other/unknown group had 28.6% (n = 14). The Chi-Square test revealed \( \chi^2 = 9.246, \, df = 4, \, p = .055 \) (Table 7). This result suggests that race
may be a predictor of appropriate visits but it does not meet the decision level for this study.

**Appropriate Visits Versus Race with Access to the Educational Tool**

Examining appropriate visits and race by those who read the educational program (n = 20) show that $X^2 = 9.778$ df = 5, and $p = .082$ (Table 8) indicating that race was not a predictor of appropriate visits when the parents had read the educational tool.

**Appropriate Visits Versus Use of Antipyretics with Access to the Educational Tool**

Examining the use of antipyretics and the appropriateness of the visit by those in the treated group who read the educational handout compared to those who did not read the tool showed that 65.0% (n = 13) of those who read the handout used antipyretics prior to having an appropriate visit and 56.1% (n = 46) of those who did not read the educational handout, but used antipyretics prior to going to the emergency room, had an appropriate visit. When the two groups were compared $X^2 = .523$, df = 1, and $p = .470$ (Table 9), failing to support a relationship between the use of antipyretics by those who had access to the educational tool ant those that did not.

**Appropriate Visits Versus First Child**

The comparison of appropriate visits and being the first born child in the family showed that 33.3% (n = 41) had an appropriate visit while 21.4% (n = 21) of the children that were not the first born had an appropriate visit. The Chi-Square Test revealed $X^2 = 3.830$, df = 1, $p = .050$ (Table 10). This demonstrates that the ordinal position of the child is a predictor of appropriate visits.
Appropriate Visits Versus First Child with Access to the Educational Tool

Analyses of appropriate visits and the first child when the parent had access to the educational tool did not support a relationship between appropriate visits and being the first child in the family and having read the educational tool. Fisher’s Exact Test showed that p = .303 (Table 11).

Appropriate Visits Versus Only Child

The appropriate visit versus being the only child demonstrated that 31.7% (n = 32) of only children had appropriate visits compared to 25.0% (n = 30) of those who were not the only child in the family. The Chi-Square calculation ($X^2 = 1.214$, df = 1, p = .271) (Table 12) does not support only children versus not being an only child as a predictor of appropriate visits to the emergency room.

Appropriate Visits Versus Only Child with Access to the Educational Tool

The analyses showed that appropriate visits and being the only child when the parents had read the educational tool did not have a predictive relationship. Fisher’s Exact Test calculated p = .603 (Table 13).

Appropriate Visits Versus Access to the Educational Tool

Comparing appropriate visits and access to the educational tool showed that 75.0% (n = 15 of 20) of those who read the educational tool had an appropriate visit while 20.7% (n = 17 of 82) of those who did not read the educational tool had an appropriate visit $X^2 = 21.993$, df = 1, p = .000 (Table 14). This shows a high correlation between appropriate visits and having read the educational tool.
Summary of Findings

This chapter has presented the statistical findings and demographic information of the subjects involved in this research study. The appropriateness of the visit to the emergency room for a child's fever and the subjects were examined in relation to the age of the parent, rank of the parent, race, use of antipyretics, the child in the first ordinal position, the only child in the family, and by access to the educational tool. The control group and treatment group were also compared by the number of appropriate visits.

Results of the data analyses showed that reading the educational tool, parental age, and being the first child in the family had a relationship to the appropriateness of the emergency room visit for pediatric febrile illness. The subject's race may also be predictive of an appropriate visit. The control year, treatment year, rank of the parent, and being an only child were not predictive of the appropriateness of the visit. Nor was there support for a relationship between the combination of appropriate visits and reading the educational tool with the use of antipyretics, race, being the first child in the family, and being the only child in the family.
CHAPTER VI

DISCUSSION, CONCLUSIONS & RECOMMENDATIONS

Introduction

This chapter presents a brief summary of the study data and discussion of the findings as they relate to the description of the sample, research hypothesis, and additional analyses that were performed. From the discussion, conclusions are presented. Additionally, limitations of the study, implications for nursing practice, and recommendations for further research are also included in this chapter.

Summary of the Study

A quasi-experimental design with two groups, treatment and control with a post-test was used to test the hypothesis of this study. The study was done to determine if providing direct and indirect information to parents would result in an increase in appropriate use of the emergency room for their child’s fever and decrease the number of inappropriate visits. The research question was developed based upon review of the literature and the Neuman Systems Model (1995), the study’s conceptual framework. The educational tool is primary prevention and designed to strengthen the flexible line of defense as described by Newman (1995). In addition to the research hypothesis, the study also examined relationships or predictors between appropriate/inappropriate visits to the
emergency room for pediatric fever and race, age of parent, military rank of parent, use of antipyretics, the child being in the first ordinal position, the child being an only child, and reading the educational handout. Frequency distributions and descriptive statistics were used to analyze the demographic information as well as the physiological data taken from the charts.

The data were collected from a review of charts from first of July to the eighteenth of August in 2000 (control group) and 2001 (treatment group). The criteria to determine the appropriateness of the emergency room visit was based upon the review of literature and the policies of the Mike O'Callaghan Federal Hospital emergency room. To analyze the relationship between visits and the factors associated with the parent or child, Chi-square test was utilized.

Discussion of Findings

A total of 225 visits, 119 in 2000 and 106 in 2001 qualified for inclusion in the study. Four of the visits in 2001 were excluded from the study as information regarding access to the handout was not obtained from the parent thus leaving a total of 221 visits included in the study.

Research Hypothesis

The research hypothesis, "The number of inappropriate visits to the emergency room for non-urgent pediatric febrile illnesses will decrease after direct and indirect information regarding childhood fever and its treatment is provided to a select group of parents." can not be accepted after examining the results of this study. In 2000, 74.8% (n = 89) of the 119 visits were determined to be inappropriate and in the year 2001, 68.6%
(n = 70) of the 102 visits were found to be inappropriate. While the percentage of inappropriate visits did decrease, the difference was not significant ($X^2 = 1.033, p = .309$). This is in agreement with the findings by Kelly et al., (1996) in which the educational intervention did not result in a behavior change. The failure to reject the null hypothesis, however, may be in error as only twenty of 102 subjects had access to the educational tool. It is possible that had a larger percentage of the subjects read the educational tool, more of the visits would have been appropriate or perhaps some of the inappropriate visits would not have occurred. The following paragraph demonstrates the relationship between appropriate visits and having read the educational tool.

**Appropriate Visit and Access to the Educational Tool**

Only twenty of the 102 parents in the treatment group had read the educational tool or the article in the newspaper. The low number of the treated parents (n = 20) may have occurred since the handout was available only six weeks prior to the start of the data collection. Another possibility is that after having read the handout, the parent determined that their child’s fever was not emergent and thus decided not to seek care at the emergency room. When the visits of this group of twenty were compared to those that had not read the educational flyer, 75.0% (n = 15) of their visits were appropriate while only 20.7% (n = 17) of those that had not read the tool had appropriate visits. Chi-square analysis showed there was a high positive correlation between having read the educational handout and having an appropriate visit ($X^2 = 21.993, p = .000$). This contradicts the study by Kelly et al., (1996) and supports the findings of Casey et al., (1984) and Robinson et al., (1989) that educational interventions resulted in behavior changes.
Appropriate Visit and Age of Parent

The thirty and younger group had a greater percentage of appropriate visits (35.5%, n = 49) than the over thirty group (15.7%, n = 13) of the time. The Chi-square test showed a significance of .001 indicating that parental age is a predictor of an inappropriate visit. Parental age remained a predictor for appropriate visits when the parents had read the educational tool with a significance of .004. It could be argued that as a parent ages and gains experience the number of inappropriate visits would decrease however this study did not bear that out. More inappropriate visits were done by those over thirty years of age. A possible explanation could be that with age, the parent learned how to utilize the military health care system. Since the parent incurs no cost, there is no monetary incentive to take the child to their primary care provider. Another possible reason may be that the older parents have seen or heard of negative outcomes with pediatric fever and have become more fearful of it and therefore inappropriately utilize the emergency room. Use of the emergency room may have also occurred because the parent was unable to secure an appointment in the Pediatric Clinic or it was after normal clinic hours.

Appropriate Visits and Military Rank of Parents

The military sample of parents were divided into two groups, enlisted (n = 203) and officer (n = 18). The enlisted parent must have a minimum of a high school diploma and an officer has a minimum of a baccalaureate degree. Enlisted parents had appropriate visits 28.1% (n = 57) of the time and officers 27.8% (n = 5). Chi-square test did not show any significance difference between the two groups. Nor did having read the educational tool have an effect on the ability to predict inappropriate visits based on rank. Therefore,
in this study, educational level and rank were not predictors of appropriate visits to the emergency room for their child’s fever. This is most likely true because caring for a febrile child is not included in a typical degree program unless it is a medically related degree. Therefore, knowledge relating to pediatric fever is likely to be the same for officers and enlisted personnel unless their education is directly related to the medical field.

**Appropriate Visits and Race**

The break down of appropriate visits by race was as follows: Caucasians 21.8% (n = 22), African-Americans 48.3% (n = 14), Hispanics 20.0% (n = 4), Asians 36.4% (n = 8), and Other/Unknown 28.6% (n = 14). The Chi-square test showed a significance of .055. This result suggests that race may be a predictor of appropriate visits. However, this finding could have resulted for many reasons that include cultural differences, economic background, social background, religious beliefs, familial training, environmental influences, and others. When examining race and appropriate visits after having read the educational tool, race was no longer a predictor of appropriate visits. This may have resulted from the education of the parents negating cultural influences.

**Appropriate Visit and Use of Antipyretics**

This study did not examine the dosage of antipyretics used, only whether Acetaminophen/Ibuprofen had been given in the previous four/six hours. From the data collected, antipyretic use played no role in determining the appropriateness of the visit. Those parents that did not administer antipyretics had an appropriate visit 28.2% (n = 29) of the time and those who had given antipyretic had appropriate visits 28.0% (n = 33) of the time. Regardless of the appropriateness of the visit, antipyretics were given by the
parent only 53.4% (n = 118) of the time. This may be due to lack of education, however after reading the educational tool their antipyretic use was not a predictor of appropriate visits. The study by Kelly et al. (1996) examined antipyretic use after an educational program and also showed no change in behavior when deciding to administer antipyretics.

**Appropriate Visit and First Child**

The Chi-square test showed a positive correlation between the first child born in the family and an appropriate visit to the emergency room for pediatric fever with a significance of .05. If the child was in the first ordinal position, he/she was likely to have an appropriate visit 33.3% (n = 41) of the time. If the child was not the first born in the family, the likelihood of an appropriate visit fell to 21.4% (n = 21). This finding was interesting and not easily explained. A possible reason may be that as the parents age, they may have seen or heard of negative outcomes with pediatric fever and have become more fearful of it and therefore inappropriately utilize the emergency room. Also, the previously mentioned reason of the parent learning how to use the military medical benefits after the first child may explain why those children that are not the first born were more likely to have an inappropriate visit. After reading the educational tool however, being the first child was no longer a predictor of inappropriate visits. Reading the educational tool may have negated the afore mentioned reasons for the inappropriate visits for the first child

**Appropriate Visit and Single Child Families**

While being the first child was a predictor, being the only child was not a predictor of appropriate visits. Parents with only one child had an appropriate visit 31.7%
(n = 32) of the time and parents with more than one child had appropriate visits 25.0% (n = 30) of the time. The Chi-square test showed no significant difference between the two groups. Similarly, reading the educational tool did not change the only child as being a predictor of inappropriate visits.

Limitations

This study's applicability to the general population may be in question for the following reasons: The research was conducted in a military institution, the study population has a military affiliation, at least one of the child's parents had a minimum of a high school education which is not always true of the general population, healthcare habits of the military community may not be reflective of the general population since healthcare is "free" to the military members and their dependents. It is also not clear that the results of this study is representative of all military personnel.

The small sample of those who had access to the educational tool may be a limiting factor in this study. As a result some of the results need to be viewed with caution until there are supporting findings from other studies.

Conclusions

Results of this study suggest that when parents are provided accurate information about pediatric fevers, they are more likely to appropriately seek emergent care for their child according to the criteria. This supports the findings of Robinson et al. (1989) and Casey et al. (1984) that demonstrated educational interventions for pediatric fevers, when given to parents, resulted in behavior change. In the case of this study, usage of emergent
services was more likely to be appropriate for those parents who read the educational tool than for those parents that did not.

Results also indicated that if the parent was age thirty and under, they were more likely to use the emergency room appropriately for their child’s fever. None of the other studies looked at the age of the parents in relation to how they responded to their child’s fever.

The first child in the family, but not necessarily the only child, was significantly more likely to have an appropriate visit to the emergency room for their fever. The other reviewed studies did not address the ordinal position of the child in the family.

Race may also be related to appropriate emergency room visits. While the other reviewed studies did give the racial break down of the groups, they did not look at the results of the studies by race.

Reading the educational tool was done by only 20% of the treatment group. Other ways of providing the information to parents should be examined including instruction during the emergency room triage procedure, having the handout available for a longer period of time prior to collecting data, or use of different media for disseminating the information. It is also possible that the parents who did read the handout were able to determine that their child’s fever was not emergent and therefore decided not to seek emergent care in the emergency room.

Implications for Nursing

The results of this study suggest that providing accurate educational information to parents about pediatric fever can result in use of emergency services when appropriate.
This may be extrapolated to suggest that in order for a parent to initiate a behavior change, regardless of the infirmity, accurate information must be provided. Since educating the patient or parent in this case, is often a nursing function, it is required of the nurse to provide accurate information so the parent can make informed and appropriate decisions. By providing accurate information the parent can make decisions that will strengthen the normal line of defense, help the flexible line of defense respond to stressors, and enhance the lines of resistance as described by Neuman (1995) whose model provide the conceptual framework for this study. The results of this study contribute to the conclusion that education for the parent is a beneficial nursing intervention and results in behavior change.

An important aspect for the nurse is how to provide information to the parent. This can be achieved by utilizing an educational handout as was done in this study, or by using other media such as direct instruction, videos, tests, interviews, role playing and so forth. In addition, providing information multiple times may be needed for multiple reasons. One being repetition is reinforcing of learning. Another to consider with this population is the parent may not have seen or had access to the information if their job assignment had them off base when the newspaper article was in the base paper.

Recommendations

Based on the results of this study and studies by Robinson et al. (1989) and Casey et al. (1984) that fever education does result in parental behavior change, replication of this study should be considered with some of the following changes: educational information should be disseminated to a larger portion of the target group, the study
should occur in the general population as well as a military facility, and consider conducting the study over a longer period of time to determine if the behavior change endured. Other information that would be beneficial to have investigated would be knowledge of whether the parents utilized any phone triage system before visiting the ER, what was the time frame between having read the educational tool and the actual visit to the ER, were any of the visits repeat visits, and where did the parents see the handout to determine the most effective means of disseminating the information.

A study examining the proper use of antipyretics would also appear to be beneficial. Only 53% of the participants in this study used antipyretics before bringing their child to the emergency room and it is not know if they were administering the correct dosage for their child. The only data collected regarding antipyretics was if it had been given with in the appropriate time frame. A study examining the use, dosage, appropriate time frame, and parents’ ability to learn and retain this knowledge would be valuable to ensure proper treatment of the febrile child.

The use of educational interventions should continue to be studied since they can be valuable tools for the practitioner to use to assist his/her patients in caring for themselves and their families. The type of educational intervention ie. newspaper articles, fliers, one-on-one education, video, classroom, etc. should be studied to determine if they have similar or different impact on subjects.
<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Appropriate</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Control (2000)</td>
<td>119</td>
<td>89</td>
<td>74.8</td>
<td>30</td>
</tr>
<tr>
<td>Treatment (2001)</td>
<td>102</td>
<td>70</td>
<td>68.6</td>
<td>32</td>
</tr>
<tr>
<td>Total</td>
<td>221</td>
<td>159</td>
<td>71.9</td>
<td>62</td>
</tr>
</tbody>
</table>

$X^2 = 1.033$, df = 1, p = .309
### Table 2  
**Appropriate Visit vs Age of Parent**

<table>
<thead>
<tr>
<th>Age of Parent</th>
<th>N</th>
<th>Appropriate</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>30 and under</td>
<td>138</td>
<td>89 64.5</td>
<td>49</td>
<td>35.5</td>
</tr>
<tr>
<td>Over 30</td>
<td>83</td>
<td>70 84.3</td>
<td>13</td>
<td>15.7</td>
</tr>
<tr>
<td>Total</td>
<td>221</td>
<td>159 71.9</td>
<td>62</td>
<td>21.8</td>
</tr>
</tbody>
</table>

$X^2 = 10.112, \ df = 1, p = .001$
Table 3  
*t-Test. Appropriate Visits in Relation to Age of Parents*

<table>
<thead>
<tr>
<th>Appropriate</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Standard Error of Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>62</td>
<td>27.69</td>
<td>5.816</td>
<td>.739</td>
</tr>
<tr>
<td>No</td>
<td>159</td>
<td>30.40</td>
<td>6.850</td>
<td>.543</td>
</tr>
</tbody>
</table>

$t = -2.948, df = 130.147, p = .004$
Table 4  

**t-Test, Appropriate Visits in Relation to age of Parents with Access to Educational Tool**

<table>
<thead>
<tr>
<th>Appropriate</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Standard Error of Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>15</td>
<td>27.20</td>
<td>5.747</td>
<td>1.484</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>37.20</td>
<td>6.943</td>
<td>3.105</td>
</tr>
</tbody>
</table>

\[ t = -3.210, \text{df} = 18, p = .005 \]
Table 5  Appropriate Visits vs Rank of Parent

<table>
<thead>
<tr>
<th>Rank of Parent</th>
<th>N</th>
<th>Appropriate</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Officer</td>
<td>18</td>
<td>13</td>
<td>72.2</td>
<td>5</td>
</tr>
<tr>
<td>Enlisted</td>
<td>203</td>
<td>146</td>
<td>71.9</td>
<td>57</td>
</tr>
<tr>
<td>Total</td>
<td>221</td>
<td>159</td>
<td>71.9</td>
<td>62</td>
</tr>
</tbody>
</table>

\[X^2 = .001, \text{ df} = 1, p = .978\]
<table>
<thead>
<tr>
<th>Rank of Parent</th>
<th>N</th>
<th>Appropriate</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Officer</td>
<td>2</td>
<td>2</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Enlisted</td>
<td>18</td>
<td>5</td>
<td>27.8</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>5</td>
<td>25.0</td>
<td>15</td>
</tr>
</tbody>
</table>

Fisher's Exact Test, $p = 1.000$
Table 7  **Appropriate Visits vs Race**

<table>
<thead>
<tr>
<th>Race</th>
<th>N</th>
<th>Appropriate</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>Yes</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>White</td>
<td>101</td>
<td>79 78.2</td>
<td>22</td>
<td>21.8</td>
</tr>
<tr>
<td>Black</td>
<td>29</td>
<td>15 51.7</td>
<td>14</td>
<td>48.3</td>
</tr>
<tr>
<td>Hispanic</td>
<td>20</td>
<td>16 80.0</td>
<td>4</td>
<td>20.0</td>
</tr>
<tr>
<td>Asian</td>
<td>22</td>
<td>14 63.6</td>
<td>8</td>
<td>36.4</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>49</td>
<td>35 71.4</td>
<td>14</td>
<td>28.6</td>
</tr>
<tr>
<td>Total</td>
<td>221</td>
<td>159 71.9</td>
<td>62</td>
<td>28.1</td>
</tr>
</tbody>
</table>

$X^2 = 9.246$, df = 4, p = 0.055
Table 8  
**Appropriate Visits vs Race of Parent with Access to Educational Tool**

<table>
<thead>
<tr>
<th>Race</th>
<th>N</th>
<th>Appropriate</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>White</td>
<td>8</td>
<td></td>
<td>8</td>
<td>100.0</td>
</tr>
<tr>
<td>Black</td>
<td>2</td>
<td></td>
<td>2</td>
<td>100.0</td>
</tr>
<tr>
<td>Hispanic</td>
<td>3</td>
<td>2</td>
<td>66.7</td>
<td>1</td>
</tr>
<tr>
<td>Asian</td>
<td>4</td>
<td>1</td>
<td>25.0</td>
<td>3</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>3</td>
<td>2</td>
<td>66.7</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>5</td>
<td>25.0</td>
<td>15</td>
</tr>
</tbody>
</table>

\[X^2 = 9.778, \text{df} = 5, p = .082\]
Table 9  Use of Antipyretics by Access to Intervention (2001)

<table>
<thead>
<tr>
<th>Access to Intervention</th>
<th>N</th>
<th>Appropriate Use of Antipyretics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>No</td>
<td>82</td>
<td>36 43.9</td>
</tr>
<tr>
<td>Yes</td>
<td>20</td>
<td>7   35.0</td>
</tr>
<tr>
<td>Total</td>
<td>102</td>
<td>43 42.2</td>
</tr>
</tbody>
</table>

$X^2 = .523, df = 1, p = .470$
Table 10  **Appropriate Visits vs First Child**

<table>
<thead>
<tr>
<th>First Child</th>
<th>N</th>
<th>Appropriate Visit</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>Yes</td>
<td>%</td>
</tr>
<tr>
<td>No</td>
<td>98</td>
<td>77</td>
<td>21</td>
<td>21.4</td>
</tr>
<tr>
<td>Yes</td>
<td>123</td>
<td>82</td>
<td>41</td>
<td>33.3</td>
</tr>
<tr>
<td>Total</td>
<td>221</td>
<td>159</td>
<td>62</td>
<td>28.1</td>
</tr>
</tbody>
</table>

$X^2 = 3.830$, df = 1, p = .050
Table 11  
**Appropriate Visits vs First Child with Access to Educational Tool**

<table>
<thead>
<tr>
<th>First Child</th>
<th>N</th>
<th>Appropriate Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>No</td>
<td>10</td>
<td>4 40.0</td>
</tr>
<tr>
<td>Yes</td>
<td>10</td>
<td>1 10.0</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>5 25.0</td>
</tr>
</tbody>
</table>

Fisher's Exact Test, p = .303
<table>
<thead>
<tr>
<th>Only Child</th>
<th>N</th>
<th>Appropriate Visit</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N    %</td>
<td>N    %</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>120</td>
<td>90  75.0</td>
<td>30  25.0</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>101</td>
<td>69  68.3</td>
<td>32  31.7</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>221</td>
<td>159 71.9</td>
<td>62 28.1</td>
<td></td>
</tr>
</tbody>
</table>

$X^2 = 1.214, \text{ df } = 1, p = .271$
Table 13  **Appropriate Visits vs Only Child with Access to Educational Tool**

<table>
<thead>
<tr>
<th>Only Child</th>
<th>N</th>
<th>Appropriate Visit</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>4</td>
<td>8</td>
<td>66.7</td>
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<td>1</td>
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<td>87.5</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>5</td>
<td>15</td>
<td>75.0</td>
</tr>
</tbody>
</table>

Fisher's Exact Test, p = .603
Table 14  
**Appropriate Visits in Relation to Access to Educational Tool**

<table>
<thead>
<tr>
<th>Access</th>
<th>N</th>
<th>Appropriate Visit</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>No</td>
<td>82</td>
<td></td>
<td>65</td>
<td>79.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>17</td>
<td>20.7</td>
</tr>
<tr>
<td>Yes</td>
<td>20</td>
<td></td>
<td>5</td>
<td>25.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>15</td>
<td>75.0</td>
</tr>
<tr>
<td>Total</td>
<td>102</td>
<td></td>
<td>70</td>
<td>68.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>32</td>
<td>31.4</td>
</tr>
</tbody>
</table>

\[X^2 = 21.993, \text{ df } = 1, p = .000\]
DATE:       June 4, 2001
TO:         Brian Bishop
            Nursing
            M/S # 3018
FROM:       Dr. Jack Young, Chair
            UNLV Biomedical Sciences Institutional Review Board
RE:         Status of Human Subject Protocol Entitled:
            "Increasing Parental Knowledge in the Treatment of Childhood Fever"
            OPRS #501a501-043

This memorandum is official notification that the protocol for the project referenced above has
been reviewed by the Office for the Protection of Research Subjects and has been determined as
have having met the criteria for exemption from full review by the UNLV Biomedical Sciences
Institutional Review Board. In compliance with this determination of exemption from full
review, this protocol is approved for a period of one year from the date of this notification and
work on the project may proceed.

Should the use of human subjects described in this protocol continue beyond a year from the date
of this notification, it will be necessary to request an extension. Should you require any
change(s) to the protocol, it will be necessary to request such change through the Office for the
Protection of Research Subjects in writing.

If you have any questions or require assistance, please contact the Office for the Protection of
Research Subjects at 895-2794.

cc: OPRS File

Office for the Protection of Research Subjects
4505 Maryland Parkway • Box 451046 • Las Vegas, Nevada 89154-1046
(702) 895-2794 • FAX (702) 895-4242

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University of Nevada, Las Vegas
Protocol Cover Page for Research Involving Human Subjects

For UNLV use only: Log Number_; Date Received_

Principal Investigator (Please print):
Name: Brian Bishop; Department: Nursing; Phone: 437-6560
Email: punxsyboy@unlv.student; Faculty: □ Doctoral Student; □ Masters Student; □ Undergrad.

Faculty Advisor (If applicable): Name: Margaret Kees; Department: Nursing

Title of Project: Increasing Parental Knowledge in the Treatment of Childhood Fever

Duration of Study: Start: June 1, 2001; End: July 30, 2001

Study Is (Check all applicable items):
✓ for thesis/dissertation; __ being submitted as a proposal for funding (attach proposal draft if checked);

is funded by an existing grant or contract (Indicate source of funds) ________________________________

Subject Data (Indicate number of subjects to be used in each subject type category):
200 Adults (non-student); ___ UNLV Students; ___ CCSD Students; ___ Minors (under 18); ___ Patients;
___ Pregnant women or fetuses; ___ Prisoners, incarcerated persons; ___ Mentally disabled;
___ Physically disabled; ___ Others subject to physical, emotional, social, or legal risk

Procedures (Indicate all that apply):
✓ No personal interaction with subjects ____________________________
___ Personal interaction with subjects ____________________________
___ Survey/questionnaire ____________________________
___ Interviews ____________________________
___ Observation ____________________________
___ Medical or other personal records/data ____________________________

Invasive biomedical procedures ____________________________
Non-invasive biomedical procedures ____________________________
Psychological intervention/treatment ____________________________
Use of potentially hazardous materials ____________________________
Use of radiation or lasers ____________________________

Signatures:
Principal Investigator: ____________________________: Date: 6/25/01

Faculty Advisor (if applicable): ____________________________: Date: 6/25/01

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Human Subjects' Rights Protocol

Brian Bishop

Nursing

1. Increasing Parental Knowledge In The Treatment Of Childhood Fever

SUBJECTS: The subjects will be a convenience sample of parents that bring his/her child to the emergency room with a chief complaint of fever. The only qualification for the parent to participate in the study, is the child to have a chief complaint of fever. The child is not the subject of the study, however information regarding the child’s symptoms will be used to determine the appropriateness of the emergency room visit. There will be no personal interaction between the investigator and the child. Interaction between the interviewer and parents will consist of obtaining consent and determining if they had access to the educational program.

2. PURPOSE, METHODS, PROCEDURES: The purpose of this study is to test an educational program designed to increase parental knowledge of when it is appropriate or necessary to seek emergent intervention for their child’s febrile status. Emergency room charts and statistical information will be reviewed for the past three years to determine a time period where the number of patients seen as well as the number of pediatric visits are comparable. Once the time frame is determined, the number of inappropriate visits for pediatric fever will then be tabulated. This information will be used to compare to the data collected after the implementation of the educational program.

Beginning six weeks prior to the current data collection period, an educational handout will be given to each parent that brings their child into the pediatric clinic. This will continue through the data collection period. During the same time period a display
will be placed in the emergency room waiting area with the educational handout available. An article with information on childhood fevers will also be placed in the base newspaper one week before the data collection period. This article will describe when a visit to the emergency room for pediatric fever is warranted and measures a parent can use to care for the child at home. Data will be gathered over a six to eight week period by the investigator from a review of the charts. Consent from the parents to participate in the study will be obtained from the parent/parents at the time of the visit. Demographic information will be obtained from the chart. The subjects will be questioned to determine if they had received the informational handout or read the article on fever that was published in the base newspaper. The appropriateness of the visit will be determined by examining the chart.

3. **RISKS:** The potential risk to the subjects is minimal. A possible risk is that the parent will be hesitant to seek emergent care for his/her child, however, this risk is reduced by the accurate information on childhood fever that is provided to the parent. By simply following the information on the educational handout, the risk is reduced. The handout also contains telephone numbers that the parent is encouraged to call if the parent is uncertain of what he/she should do when the child is febrile. The combination of information in the handout and access to professional medical advice via telephone should minimize this potential risk.

4. **BENEFIT:** The perceived benefit to the parent and his/her child is accurate information and appropriate care of pediatric febrile illness. The result will be increased comfort for the child and diminished anxiety and stress for the parent. The military population will benefit by reducing the number on non-emergent patients waiting to be
seen in the emergency room thus providing faster care for those who are more seriously ill. Society as a whole will benefit from the savings of tax monies that would have been consumed for the inappropriate emergent visit to the emergency room.

5. RISK-BENEFIT RATIO: The benefits of this study, as described above, outweigh the potential risk.

6. COSTS TO SUBJECTS: There is no anticipated added expense to the subject or to a third party. The amount of time needed will only be to answer one yes/no question.

7. INFORMED CONSENT: Informed consent will be obtained by the investigator at the time of the emergency room visit if required by the IRB at Travis AFB. The researcher will retain all records for three years in a secure location.
Per the IRB at David Grant Medical Center, Travis AFB, informed consent does not need to be obtained.
MEMORANDUM FOR Mr. Brian Bishop
Maj Lori Fink
99 MDOS/SGOPE
4700 Las Vegas Blvd N.
Nellis AFB, NV 89191-6601

FROM: 60th Medical Group/SGSEM
101 Bodin Circle
Travis AFB, CA 94535-1800

SUBJECT: Approval of FDG20010015E

1. On 5 March 2001, the 60th Medical Group, David Grant USAF Medical Center Institutional Review Board (IRB), approved your research proposal titled, “Increasing Parental Knowledge in the Treatment of Childhood Fever” and it is assigned protocol #FDG20010015E. Please refer to this number in all future correspondence regarding the study. Your study was classified exempt from the common rule in accordance with 32CFR219.101(b)(2).

2. To assist in the proper accomplishment of the study you should assure compliance with AFI 40-402. Protection of Human Subjects in Biomedical and Behavioral Research, as it pertains to annual progress reports, final reports and the proper maintenance of records. An informed consent document is not necessary for this protocol.

3. Attached is a certificate of compliance with AFI 40-402. Complete it, retain a copy for your reference, and return the original to SGSEM through your element/flight chief (or equivalent) NLT 23 Mar 01.

Dr. Mary S. Nelson Lt Col, USAF, NC
Associate Director Clinical Investigation Facility

Attachments:
1. Memorandum from 60 MDG/CC
2. Memorandum from SGB (SGSEM)
3. Certificate of Compliance, AFI40-402

cc:
Protocol File
APPENDIX D

INTERVENTION: EDUCATION TO PARENTS
My Child Has A Fever!

A Guide For Parents:

By Lori Fink, Major USAFNC and Brian Bishop RN

It’s that time of year when the sniffles, aches, fevers, and flu seem to be at their worst, especially for your child. This article is designed to help you care for your child’s fever so that your child is comfortable and you retain your sanity.

Fever is the body’s natural response to fight an infection and helps to activate the immune response. The following is a guide to help you to manage your child’s fever and to determine when to seek medical help.

When to bring your child to the Emergency Room:

- Your child is 3 months old or less and has a fever of 100.4 F (38.0 C).
- Your child’s fever is above 103 F (39.4 C) and the Pediatric Clinic is closed.
- Your child’s fever is above 105 F (40.6 C).
- Your child is crying inconsolably.
- Your child is difficult to awaken.
- Your child is confused or delirious.
- Your child has a seizure.
- Your child has a stiff neck.
- Your child has purple spots on the skin.
- Your child is having difficulty breathing even after the nose is cleared.
- Your child is acting and looks very sick.
- Your child has increased risk factors for serious infection (e.g., sickle cell)

**When to call the Pediatric Clinic:**

- Your child is 3-6 months old and has a fever of 100.4 F (38.0 C).
- Your fever is above 103 F (39.4 C) but less than 105 F (40.6).
- Your child is crying inconsolably.
- Your child has increased risk factors for serious infection (e.g., sickle cell)
- Your child had a fever that went away and then returned after 24 hours.
- Your child has a fever for more than 24 hours without an obvious cause (e.g., immunizations, cough/cold)
- Your child has a fever for 72 hours.
- Your child has a history of febrile seizures.

**What you can do at home:**

- The most important thing to remember is to treat the child and not the number on the thermometer. For example, if your 2-year-old has a fever of 101 F but is eating, drinking, and playing normally, you don’t need to treat the fever. On the other hand, if the same child complains of not feeling well with a fever of 100.4 F, then you should give him/her either ibuprofen (Motrin) or acetaminophen (Tylenol). See instructions below.
- Keep your child lightly dressed, **do not** bundle your child in heavy clothing. When your child is shivering or having chills, provide him/her with a light blanket.
- Give your child plenty of fluids to drink (popsicles, iced drinks). Don’t
worry if your child will not eat, drinking fluids is the most important.

- Make sure your child is making urine/having wet diapers.

**Tylenol & Motrin:**

- It is best to use your child’s weight to calculate the correct amount of medicine to give.
- Tylenol can be given if your child is 3 months of age or older. If less than 3 months of age, check with your doctor before medicating your child.

  **Tylenol:** give 10mg/kg or 5mg/pound every 4-6 hrs. as needed to control fever.

- Motrin can be used if your child is 6 months of age or older.

  **Motrin:** give 10mg/kg or 5mg/pound every 6-8 hrs. as needed to control fever.

*Call any of the numbers listed below for medication questions or any other concern.*

Pediatric Clinic: 653-2360, Tri-care Nurse Advice Line: 1-800-887-4111,

Emergency Room 653-2343

Treating Childhood Fever

When to bring your child to the Emergency Room:(for any one of the following)
♦ Your child is 3 months old or less and has a fever of 100.4 F (38.0 C).
♦ Your child’s fever is above 103 F (39.4 C) and the Pediatric Clinic is closed.
♦ Your child’s fever is above 105 F (40.6 C).
♦ Your child is crying inconsolably.
♦ Your child is difficult to awaken.
♦ Your child is confused or delirious.
♦ Your child has a seizure.
♦ Your child has a stiff neck.
♦ Your child has purple spots on the skin.
♦ Your child is having difficulty breathing even after the nose is cleared.
♦ Your child is acting and looks very sick.
♦ Your child has increased risk factors for serious infection (e.g., sickle cell)

When to call the Pediatric Clinic:
♦ Your child is 3-6 months old and has a fever of 100.4 F (38.0 C).
♦ Your fever is above 103 F (39.4 C) but less than 105 F (40.6).
♦ Your child is crying inconsolably.
♦ Your child has increased risk factors for serious infection (e.g., sickle cell)
♦ Your child had a fever that went away and then returned after 24 hours.
♦ Your child has a fever for more than 24 hours without an obvious cause (e.g., immunizations, cough/cold)
♦ Your child has a fever for 72 hours.
♦ Your child has a history of febrile seizures.

Home Care:
♦ The most important thing to remember is to treat the child and not the number on the thermometer. For example, if your 2-year-old has a fever of 101 F but is eating, drinking, and playing normally, you don’t need to treat the fever. On the other hand, if the same child complains of not feeling well with a fever of 100.4 F, then you should give him/her either ibuprofen (Motrin) or acetaminophen (Tylenol). See instructions below.
♦ Keep your child lightly dressed, do not bundle your child in heavy clothing. When your child is shivering or having chills, provide him/her with a light blanket.
♦ Give your child plenty of fluids to drink (popsicles, iced drinks). Don’t worry if your child will not eat, drinking fluids is the most important.
♦ Make sure your child is making urine/having wet diapers.

Tylenol & Motrin:
♦ It is best to use your child’s weight to calculate the correct amount of medicine to give.
♦ Tylenol can be given if your child is 3 months of age or older. If less than 3 months of age, check with your doctor before medicating your child.
→ Tylenol: give 10mg/kg or 5mg/pound every 4-6 hrs. as needed to control fever.
♦ Motrin can be used if your child is 6 months of age or older.
→ Motrin: give 10mg/kg or 5mg/pound every 6-8 hrs. as needed to control fever.

Call any of the numbers listed below for questions regarding medications or any other concern.
Pediatric Clinic: 653-2360, Tri-care Nurse Advice Line: 1-800-887-4111, Emergency Room 653-2343
**Emergency Care & Treatment -- 55th Medical Group**

**Personal Data - Privacy Act of 1974 (PL 93-573)**

**Arrival Date/Time:**

**3rd Party Payer:**

**Trans to Hospital:** PRIVATELY OWNED VEHICLE

**History Obtained from:**

**Addr.:** LAS VEGAS NV

**Sex:**

**Age:**

**Weight:**

**Fly Y/N:**

**PRP Y/N:**

**Chief Complaint:** FEVER

**Allergies (Check if all info is correct):**

**Triage Category:**

- **Emergent**
- **Urgent**
- **Nonurgent**

**LMP:**

**Last Tetanus:**

**Current Medications:**

**Triage Examination Performed By:**

**Time:**

- **Pain Scale:**
- **SBP:**
- **DBP:**
- **Pulse:**
- **Reso.:**
- **Temp:**
- **SpO2:**
- **Other:**

**IV Insertion:**

- **Site:**
- **Start/Finish:**

**IV Ant:**

- **Total:**

**Med Admin:**

- **Int Time Site:**
- **Time Assessed/Response:**
- **Int (+) Med Test Time:**
- **Peak Flows:**
- **Breath Sounds:**

**Nursing Progress Notes:**

**Signature of EMT/Stamp**

**Signature of Nurse/Stamp**

**02/**

- **NAME:**
- **DOB:**
- **SEX: MALE**

- **PNCAT/RANK:**
- **NMN:**
- **MRN:**

- **SPN:**
- **UNIT:**
- **OPR:**

- **REC LOC: OUTPATIENT RECORDS**
- **PCH:**

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Personal Data - Privacy Act of 1974 (PL 93-579)

Time Orders

<table>
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<th>Time</th>
<th>(Provider H &amp; P/Time Seen)</th>
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</tbody>
</table>

D/C Handouts

Lab Results:

Assessment/DX:

Disposition: [Home, Duty]

Referred to: [Qtrs, 24hrs, 48hrs, 72hrs]

Admitted to: [Today, 72hrs, Routine]

Release Time:

Condition Upon Release:

(Deteriorated)

(Improved)

(Stable)

(Chronic)

Discharge Instructions:

Follow up with [Consultant] if not better in [days].

Medication risks, benefits & side effects discussed [Consultant].

Return to ER if worse.

Consultant: [Signature of Physician/Stamp]

I have received and understand my discharge instructions to include a copy of this SF58. In addition, I permit this record to be sent to follow-up Providers. Signature of Patient:

[Signature of Patient/Stamp]

02/

NAME:

PATC/N/RANK:

SPON:

AGE:

PCM:

Signature of Physician Assistant/Stamp

Signature of Physician/Stamp
APPENDIX F

DATA COLLECTION TOOL
Data Collection Tool

ID#

Parental access to education program. yes___ no___

Appropriate visit to the ER. yes___ no___

<table>
<thead>
<tr>
<th>Parent</th>
<th>Child</th>
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<tbody>
<tr>
<td>Age:</td>
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<tr>
<td>Gender:</td>
<td></td>
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<tr>
<td>Race:</td>
<td></td>
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<tr>
<td>Rank:</td>
<td>X</td>
</tr>
<tr>
<td>Education:</td>
<td></td>
</tr>
<tr>
<td>Number of children in family:</td>
<td>X</td>
</tr>
<tr>
<td>Ordinal position of child among siblings:</td>
<td></td>
</tr>
<tr>
<td>Temperature:</td>
<td>X</td>
</tr>
<tr>
<td>Use of Motrin/Tylenol: yes___ no___</td>
<td></td>
</tr>
<tr>
<td>Other signs &amp; symptoms: Subjective</td>
<td></td>
</tr>
<tr>
<td>Objective</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX G

AGENCY APPROVAL
MEMORANDUM FOR Mr. Brian Bishop
Maj Lori Fink
99 MDC/SOGPE
4700 Las Vegas Blvd N.
Nellis AFB, NV 89191-6601

FROM: 60th Medical Group/SGSEM
101 Bodin Circle
Travis AFB, CA 94535-1800

SUBJECT: Approval of FDG20010015E

1. On 5 March 2001, the 60th Medical Group, David Grant USAF Medical Center Institutional Review Board (IRB), approved your research proposal titled, "Increasing Parental Knowledge in the Treatment of Childhood Fever" and it is assigned protocol #FDG20010015E. Please refer to this number in all future correspondence regarding the study. Your study was classified exempt from the common rule in accordance with 32CFR219.101(b)(2).

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Dr. Mary S. Nelson Lt Col, USAF, NC
Associate Director Clinical Investigation Facility

Attachments:
1. Memorandum from 60 MDG/CC
2. Memorandum from SGB (SGSEM)
3. Certificate of Compliance, AFI 40-402

cc:
Protocol File
APPENDIX H

FRAMEWORK MODEL
The Neuman Systems Model (Neuman, 1995)

**Basic Structure Energy Resources:**
- Temperature control.
- Response pattern.

**Flexible Line of Defense (FLD):**
- Primary prevention strengthens FLD, eg. educational program.

**Lines of Resistance:**
- Treatment / Interventions
  eg. home care of the child, antipyretics, fluids, ER visits, etc.

**Normal Line of Defense (NLD):**
- Stressors impact NLD, eg. febrile child.
February 12, 2001

P. O. Box 488

Beverly, OH 45715

Dr. Neuman:

This letter is to request your permission to use and adapt your diagram, "The Neuman Systems Model" as presented on page 17, 3rd edition (1995) *The Neuman Systems Model*, in my master's thesis entitled Increasing Parental Knowledge in the Treatment of Childhood Fever. Enclosed is a second copy of this letter as requested per our telephone conversation. I am currently enrolled in the MSN / FNP program at the University of Nevada, Las Vegas. If you have any questions please feel free to contact me. Thank you for your assistance.

Gratefully,

Brian Bishop

943 Majestic Falls Lane

Las Vegas, NV 89110

(702) 437-6560

I hereby give permission for the use of the diagram as described above.

Dr. Betty Neuman: Date: 3/18/01

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REFERENCES


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Brian Bishop

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Degrees:
Bachelor of Science, Business Administration, 1984
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Bachelor of Science, Nursing, 1995
Indiana University of Pennsylvaniana, Indiana, PA

Thesis Title: Increasing Parental Knowledge in the Treatment of Childhood Fever

Thesis Examination Committee:
Chairperson, Dr. Margaret Louis, R.N., Ph.D.
Committee Member, Ms. Patricia Alpert, R.N., A.P.N., M.S.N., M.P.H.
Committee Member, Dr. Lori Candela, R.N., Ph.D
Committee Member, Dr. Joe Crank, Ph.D