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Effects of Multimodal Fever Education on Parents of Febrile Children

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EFFECTS OF MULTIMODAL FEVER EDUCATION ON

PARENTS OF FEBRILE CHILDREN

by

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DEDICATION

This project is dedicated to my late grandmother, Caroline Selma Spence. She highly regarded education and took a great deal of pride in her family, especially her grandchildren. Her strong values and beliefs are what inspired me to achieve my goals of advancing my education in nursing and ultimately becoming fulfilled in my career. Caroline left a legacy of character and faith that will never fade or be forgotten.

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TABLE OF CONTENTS

LIST OF TABLES

Table **Page**

LIST OF FIGURES

Figure **Page**

ABSTRACT

Insufficient knowledge regarding the physiology and appropriate management of fever in children often contributes to an increased parental anxiety, inappropriate antipyretic use, and overutilization of medical resources (Chang, Liu, & Huang, 2013; Crocetti, Moghbeli, & Serwint, 2001; Schmitt, 1980). Parental concerns regarding childhood fever can lead to an overuse of health care resources as febrile illness in children accounts for approximately 20% of emergency department visits, 30% of office visits, and over 50% of after-hour phone calls to private physicians (Zomorrodi & Attia, 2008). Research shows that multidimensional educational interventions are most effective in improving parental management of fever (Young et al, 2010). The purpose of this evidence-based practice project was to provide multimodal fever education to parents of febrile children and examine the effects on parental knowledge, self-efficacy, anxiety, satisfaction, and health service utilization. The best practice recommendation includes a combination of written, verbal, and multimedia educational methods in close proximity to the time of the fever. The proposed intervention consisted of a three-minute educational video and a pamphlet on childhood fever including appropriate management developed by the American Academy of Pediatrics (2007). The intervention group participated in the parent fever education program and the control group received standard care consisting of brief verbal discussion of fever and appropriate caregiver management. Data were collected and analyzed comparing outcome measurements of knowledge, self-efficacy, anxiety, and satisfaction from both groups using the Pearson Chi square test measurement. A statistically significant difference was found in comparing participants' knowledge regarding harmful effects of fever ($p = 0.020$) and satisfaction of the education provided ($p = 0.023$). Additional studies evaluating effectiveness of multimodal fever education are necessary for further identification of the best methods to impact outcomes such as knowledge, self-efficacy, anxiety, and satisfaction.

CHAPTER 1

INTRODUCTION

Evidence-based practice (EBP) is imperative to the delivery of high quality care and positive patient outcomes (Melynk & Fineout-Overholt, 2011). EBP involves the integration of patients' values and preferences combined with clinical expertise from the practitioner as well as utilization of the best available evidence in the quest to provide safe and effective care. An important first step of EBP is to cultivate a spirit of inquiry and to question practice. In addition, the success of a practice change is dependent on the institution's culture, and EBP will thrive when fostered within the organization. Thus, in order to remain current in a climate where evidence evolves continually, practitioners and organizations alike must engage in a lifelong learning approach and challenge current practices.

A standard approach to parental education regarding childhood fever is not currently available to practitioners. Furthermore, in a literature review on management of childhood fever by parents, Walsh and Edwards (2006) reported that minimal progress has been made in the past two decades regarding knowledge, attitudes, and practices in parents. Based on observations as well as available evidence within the literature, it is clear that misconceptions, inappropriate management, overuse of medical services, and unrealistic fears in parents regarding childhood fever persist. In order to correct parental misconceptions related to childhood fever and improve parental management, an EBP practice change involving parental education in regards to safe management of childhood fever is necessary. The proposed change was to provide multimodal (i.e. mixed method of written, multi-media, and verbal) fever education to parents, legal guardians, and primary caregivers (heretofore referred to as *parents*) presenting with complaint of febrile children.

Background

Fever is common during childhood among all ethnic groups, and parental misconceptions due to insufficient knowledge regarding the physiology and appropriate management of fever often lead to increased parental anxiety, inappropriate antipyretic use which can cause toxicity and other adverse effects, in addition to an overuse of medical resources (Li-Chuan, Ching-Chuan, & Mei-Chih, 2013; van den Anker, 2012). In fact, childhood fever accounts for nearly one third of children's presenting conditions to pediatricians and other health care providers (HCPs) (van den Anker, 2012). Additionally, hospitalizations for medication overdoses were highest among children aged ≤ 5 years accounting for nearly 10,000 hospital stays in the United States annually (Schillie, Shehab, Thomas, & Budnitz, 2009).

Researchers reveal that the degree of fever does not always correlate with the severity of illness and that most fevers are benign, of short duration, and beneficial for the host (Sullivan & Farrar, 2011). In a study investigating parental misconceptions about fever, Schmitt (1980) coined the term, "fever phobia," to describe unrealistic fears or worries often experienced by parents regarding potential harmful outcomes related to childhood fever. Schmitt developed a guideline for practitioners in counseling parents aiming to reduce unwarranted concerns, and among these suggestions was education involving the definition of fever.

Health literacy, which is defined as, "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions," (Ratzan & Parker, 2006, p. 713) can have a detrimental impact on health behaviors when levels are low, particularly on the health of children as it relates to parenting practices. Low fever literacy, in particular, can contribute to increased parental anxiety, fever phobia, and overzealous use of antipyretics, such as acetaminophen and ibuprofen. Although alternating the use of

acetaminophen and ibuprofen has not been refuted, this practice is not supported by organizations such as the AAP as it increases potential for inaccurate dosing or overdosing and further promotes fever phobia (Sullivan & Farrar, 2011). Li et al. (2000) found that of 200 parents, only 1 of 14 parents who alternated antipyretics in their children appropriately gave the correct doses for both. These findings demonstrate the potential for adverse outcomes related to alternating antipyretics and low parental antipyretic knowledge. Additionally, Wallenstein and colleagues (2012) found that 0% of 100 subjects surveyed were able to correctly identify the appropriate temperature when asked to define the threshold for fever. The aforementioned problems associated with low fever literacy can best be corrected through appropriate measures towards effectively educating parents.

One major contributing factor to common misconceptions of fever management identified in the literature is a lack of consensus regarding understanding of fever and appropriate antipyretic use by nurses and HCPs (Walsh & Edwards, 2006; Sullivan & Farrar, 2011; Crocetti & Serwint, 2005). Authors emphasize the need for HCPs to equip caregivers with accurate evidence-based education as a means to combat the negative impact fever phobia has on our health care system. Furthermore, fever education should be based on current scientific evidence from a credible source, and HCPs' attitudes regarding the beneficial attributes of mild to moderate fever should be emphasized (Walsh & Edwards, 2006).

Statement of the Problem

Parental misconceptions regarding consequences associated with fever and insufficient knowledge related to appropriate management of childhood fever contributes to negative effects such as parental fever phobia and unintentional harm due to improper dosing of antipyretics in parents of febrile children. In addition, the literature contains information regarding the correlation between fever phobia and an overuse of medical

services. Thus, in order to ensure safe and judicious management of childhood fever in parents, an effective parental education program regarding fever and its proper management is necessary.

Data from literature supporting need for project. Schmitt (1980) performed a study exploring parental misconceptions about fevers and discovered that 63% of parents questioned worried about potential harmful effects of fever. Sixty-two percent of all parents believed that fever could cause serious harm, such as permanent brain damage in their child, and 52% believed that these serious complications could occur with fevers less than 104ºF, while 18% believed complications could occur with fevers 102ºF or less. An elevated temperature is the body's defense against infection and in the absence of hyperthermic insults (i.e. dehydration or heatstroke) the hypothalamic set point will not rise to lethal levels or cause harmful effects such as brain damage (Crocetti & Serwint, 2005). Informed discussions between the HCP and parent about the self-limiting nature of fever and the positive role it plays in fighting infection is an important step in dispelling myths related to fever. As researchers suggest, parental misconceptions about fever and heighted parental fears regarding potential effects of fever can result in overly anxious parents who strongly desire to reduce their children's temperature quickly, thereby leading to unsafe fever management strategies (Chang, Liu, & Huang, 2013).

In 2001, Crocetti and colleagues performed a study comparing current parental attitudes towards fever with Dr. Schmitt's study findings from 20 years earlier. Results of the study confirmed that fever phobia in parents persists. One major concern deduced from this study included excessive fever monitoring behaviors in parents such as checking their child's temperature hourly or awakening their child to give antipyretics (Crocetti, Moghbeli, & Serwint, 2001). These practices are likely to worsen the cycle of anxiety and can interfere with the child's rest, which is necessary for the promotion of

healing. Authors cited that a growing percentage of parents claimed to treat fever with antipyretics despite normal temperatures in their child. The study also found that, compared to Schmitt's findings, an increased number of parents gave their children medications at incorrect dosing intervals, as 14% claimed to give acetaminophen and 44% claimed to give ibuprofen more frequently than recommended. Through performance of unsafe practices, parents inadvertently place their children at risk for antipyretic toxicity. In addition, authors found that parental practice of alternating use of acetaminophen and ibuprofen is common during their child's febrile illness, despite a lack of evidence supporting such methods. Alternating antipyretics increases the risk of overdose due to potential dosing errors and has not been proven to be safe or effective (Purssell, 2010).

As literature reveals, the incidence of misinformed parents is common and parental concerns regarding childhood fever can lead to an overuse of health care resources. In fact, authors have shown that 20% of visits in the emergency department, more than 30% of office visits, and over 50% of after-hour phone calls to private physicians are due to fever (Zomorrodi & Attia, 2008). Persisting fever phobia may be attributed to incomplete and mixed messages provided by pediatric HCPs (Crocetti et al., 2001). Given this, it is important that pediatric HCPs assume a calm approach and serve as models for parents when discussing proper treatment of fever, being sure to avoid responding to fever as if it were a crisis (Schmitt, 1980). Additionally, pediatric nurses and practitioners can provide evidence-based education associated with fever management and encourage best practices to concerned parents to dispel misconceptions of fever. The literature supports the need for educational intervention designed to improve parental knowledge of fever and safe management practices associated with this common childhood illness. Crocetti et al. (2001) suggested that HCPs in the pediatric environment have a unique opportunity to impact parental attitudes

and practices through effective education of fever and the beneficial role it plays in illness.

Data from clinical agency supporting need for project. The site of the EBP project implementation was located at a private pediatric practice in Northern Indiana. The approximate number of patients seen at this clinical site included 4,000 patients with the average age being six months to two years (EBP Project Facility Nurse Practitioner, personal communication, June, 6, 2014). An average of 42 patients were seen daily, with a monthly average of approximately 650 patients. Averages for chief complaint of fever accounted for 20% of daily office visits. Average weekly fever related emergency department (ED) visits were estimated at two to five visits during the summer months and six to eight during the fall and winter months. In addition, an estimated 50% of all ED visits by patients in this practice were due to complaints of fever. The average number of daily phone calls related to fever concerns ranged from 25% to 50%, with an estimated percentage of 30% during the summer months and an increase to 45% during the fall and winter months of the approximated 20 calls to the pediatrician's office per day. Fever education practices at this agency included the HCPs providing brief verbal education during the scheduled appointment to parents presenting with a complaint of fever in their children. Parents who had questions about dosing antipyretics or who revealed to the HCP that they were unsure of the correct dose of antipyretic to give their children were provided magnets, which included information regarding appropriate weight based dosing for Tylenol and Ibuprofen. Although it was not consistently performed, the HCP at this practice would discuss with parents how to weigh their child when warranted. No further educational materials regarding fever and its appropriate management were offered to caregivers at this clinical agency.

Purpose of the EBP Project

The purpose of this EBP project was to evaluate the best available evidence regarding methods to increase parental knowledge of fever and its appropriate management. The literature and clinical agency data supported the need for parental education regarding safe and effective management of febrile children. It was hypothesized that a fever education program would impact parental behaviors associated with fever related illness and contribute to the mitigation of overly aggressive fever treatment caused by fever phobia. Thus, upon development of an evidence-based fever education program, the project was implemented and effects on parental knowledge, self-efficacy, anxiety, and health service utilization, as well as parental satisfaction of the education provided were examined.

PICOT. Melnyk & Fineout-Overholt (2011) explain that when searching for evidence regarding a clinical problem, beginning with an appropriately formulated question will lead to a more efficient search yielding relevant information and saving the researcher time. The compelling question to be answered by implementation of this EBP project was

> In parents of children ages six months to five years, what is the effect of multimodal education of fever and appropriate management of childhood fever, compared to standard fever education, on knowledge, anxiety, self-efficacy, and satisfaction, as well as health services utilization regarding childhood fever, over the course of 19 weeks?

Significance of the Project

Authors have strongly suggested that caregivers associate fever in their children with negative connotations; thereby, leading to unwarranted fever phobia and an overuse of health care services. As a result, parents may also feel inclined to give their children liberal doses of antipyretics in effort to rapidly achieve a “normal” temperature,

thereby increasing the potential for overdosing and toxicity. This EBP project consisted of implementation and evaluation of a multimodal fever education program, designed to examine parental knowledge, self-efficacy, anxiety, satisfaction of education, and utilization of health services related to fever. Mixed methods of video, written, and verbal instruction regarding fever and its proper management have the potential to encourage safer fever reducing practices and more judicious use of health care services by parents of children ages six months to five years. The successful implementation of this fever education program initiated the change process that continues to impact the discipline of nursing. Furthermore, achievement of positive outcomes from this EBP project and effective dissemination of results has served the profession of advanced nursing practice by furthering evidence related to parental management of febrile children.

CHAPTER 2

THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

Theoretical Framework: Self-Efficacy Theory

Bandura (1977) first introduced the theory of self-efficacy, which was derived from the social cognitive theory. Bandura (1986) described self-efficacy as, "the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations" (p. 2). The major foundation of this theory is that a person's behavior is affected by their thoughts, beliefs, and feelings (Peterson & Bredow, 2009). Additionally, Bandura (1977) postulated that expected outcomes are highly dependent on a person's level of self-efficacy toward a particular action or behavior. Self-influence or freedom of choice through "reflective thought, generative use of knowledge and skills at one's command, and other tools of self-influence," is central to the theory of self-efficacy (Peterson et al., 2009, p. 118). Bandura (1977) suggested that an individual's expectations of personal efficacy are based on four sources of information: performance accomplishments, vicarious experience, verbal persuasion, and physiological states.

Peterson et al. (2009) postulated that psychological procedures have the potential to impact an individual's level and strength of self-efficacy, thereby leading to a desired change in behavior. The initial study, which tested the theory using different treatment conditions, involved random assignment of 33 subjects with snake phobias to either a group involving, "performance accomplishments," where subjects touched the snakes; "role modeling," where subjects watched others touch snakes; or a control group, where subjects were administered the assessment procedures without any intervening treatment (Bandura, Adams, & Beyer, 1977). The investigators found that stronger, more generalized self-efficacy expectations resulted from individuals placed in the performance accomplishment group which suggested that self-efficacy was predictive of subsequent behaviors. Since this original study in 1977, the self-efficacy

theory has been used in a variety of settings and situations in the study of both health behavior change and health management.

Performance accomplishment. The first informational source of self-efficacy is performance accomplishment, which is based widely on personal mastery experiences of the individual. This source involves the individual's beliefs in one's own capabilities and limitations (de Montigny & Lacharite, 2005). Perceived mastery is raised by successes related to a particular situation and lowered by repeated failures. Once strong efficacy expectations are developed, occasional failures have minimal impact on the individual's cognitive appraisal of self-efficacy (Bandura, 1977; Peterson et al., 2009).

Vicarious experience. The second source of information involves expectations of the individual and is impacted by the construct, vicarious experience. This information source provides individuals with a reference point from which to base his or her ability to master a given situation (de Montigny et al., 2005). Vicarious experience is likely to have a greater impact on individuals who have limited previous exposure to the behavior of interest (Peterson et al., 2009). Bandura (1977) posited that individuals may develop expectations that they will succeed at a given task after first observing others adequately cope with threats and achieve success with the same task. In addition, repeatedly observing success in a variety of models who possess differing characteristics will increase the chances that the observer will believe in his or her own ability to succeed; thereby, increasing self-efficacy in the individual.

Verbal persuasion. The third construct involves persuasive suggestion, which leads an individual to believe that he or she is capable of mastering a given behavior that may have once overwhelmed him or her in the past (Bandura, 1977).

Bandura (1977) posited:

> Just as the value of efficacy information generated enactively and vicariously depends on cognitive appraisal, so does the information arising from exhortative and emotive sources. The impact of verbal persuasion on self-efficacy may vary substantially depending on the perceived credibility of the persuaders, their prestige, trustworthiness, expertise, and assuredness. The more believable the source of the information, the more likely are efficacy expectations to change. The influence of credibility on attitudinal change has, of course, received intensive study. But its effects on perceived self-efficacy remain to be investigated. (p. 202)

Bandura (1977) provides the caveat that efficacy expectations induced in this manner tend to be weaker than expectations arising from a personal accomplishment as this informational source lacks authenticity. One thought was that this could be negatively impacted by low credibility of the source of information or suggestion, leading to weaker expectations. Despite these drawbacks, social persuasion can contribute to success through corrective performance. People who are provided with provisional aids in addition to receiving social persuasion regarding their capacity to cope in difficult situations will likely put forth greater effort than an individual who is provided with performance aids alone.

Emotional arousal. The fourth and final information source involves the individual relying on cues from his or her degree of emotional arousal or physiological feedback in order to judge his or her abilities (Bandura, 1977; Peterson et al., 2009). Individuals can experience exaggerated anxiety symptoms, which far exceed their actual fear of the threatening situation simply by dwelling on thoughts of their incompetence (Bandura, 1977). Thus, emotional arousal brought on by stressful and taxing situations has the potential to negatively impact self-perceived competency of the individual.

These cues can directly impact an individual's ability to cope in specific situations and can even lead to avoidance behaviors (Bandura, 1977; Peterson et al., 2009).

Application of Self-Efficacy to Parenting

Although the theory of self-efficacy can easily be applied to parental confidence as well as one's belief in his or her parenting abilities, finding current evidence for parental self-efficacy applied specifically to fever knowledge and management has posed a challenge. A search for publications on the topic of parental self-efficacy and fever education from three online databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE via EBSCO, Educational Resources Information Center (ERIC), and Health Source: Nursing/Academic Edition. This search resulted in only one article; however, search terms, *parental self-efficacy* and *education*, resulted in 297 hits. Information obtained came from articles, which applied the theory of self-efficacy to generalized topics on parenting and various other applications i.e. self-care for chronic health conditions, and childbirth self-efficacy. In a literature review regarding management of fever in parents, Walsh and Edwards (2006) concluded that fever management education must first begin with theoretically based interventions designed to affect behavior change, which helped support the application of the self-efficacy theory to this EBP project.

Research has utilized the theory of self-efficacy and as mentioned previously, its primary focus involves the manner in which humans learn to model their behaviors after others through observational learning (Whittaker & Cowley, 2012; Peterson et al., 2009). Researchers have suggested that parental self-efficacy beliefs are central to parental practices. In fact, Bloomfield et al. (2005) found that parents who believed strongly in their abilities were more likely to persevere at a given task. This idea suggests that methods towards improvement of parental self-efficacy can impact the likelihood parents will persevere at accomplishing a particular goal. Another topic that potentially impacts

parental self-efficacy includes structural factors, such as knowledge and access to services (Purssell & While, 2011). Clear, understandable, and up-to-date information regarding medication or health behaviors are important factors in assuring parental ability towards achievement of optimal health and wellbeing of their children. This notion is highly dependent on availability of information in addition to the professional's ability to communicate in a manner that is understandable by the parent. Given this, HCPs have the opportunity to make a positive impact on parental self-efficacy. According to the theory of self-efficacy, Bandura has postulated that self-efficacy may be the single most important factor regarding the promotion of behavioral change (Glanz, Lewis, & Rimer, 1990). Additionally, it is the responsibility of the HCP to implement best practices for health education and to address multiple variables in the education program in order to produce behavior change. For instance, it makes little sense for the HCP to help parents build self-efficacy at fever management by providing them with provisional aids and verbal persuasion without also offering methods to effectively manage fever at home and reducing their fears by clearing up common misconceptions regarding harmful effects of fever.

In order to effectively influence parental self-efficacy regarding fever management of a child in the home, provision of a credible educational intervention on the topic of fever and its management was deemed necessary. Although this multimodal educational intervention only targeted one of the four informational sources, improving parental self-efficacy through verbal persuasion, the remaining three constructs were also likely to be indirectly impacted during the process. An increase in parental confidence may contribute to improvement of personal mastery experiences with increased knowledge, which impacts their ability to effectively manage their children's fever in the home. In addition, decreasing parental anxieties towards childhood fever is likely to positively impact the construct, emotional arousal.

Self-efficacy beliefs are also influenced by an individual's cognitive appraisal of efficacy including preconceptions of ability, perception of the task's level of difficulty, external aid received, expenditure of effort, as well as the circumstance of the situation (Bandura, 1995). McDonald et al. (2012) performed a study exploring the effect of educational materials for cystic fibrosis (CF) on parental self-efficacy and confidence. They found that although parental knowledge of CF management did not significantly increase over the course of the study, outcomes of parental confidence, as well as satisfaction with the educational materials did increase. The literature supports the premise that parental confidence is likely to improve with support from the HCP, as well as effective educational methods meant to reinforce parental knowledge regarding important topics such as fever.

In a systematic review evaluating the effectiveness of educational strategies in improving parental fever management, Young et al. (2010), suggested that among theories which impact parental behavior change is one that targets parental perceptions of control as well as knowledge. Therefore, despite the fact that studies measuring the ability to affect change in parental behaviors are limited, the self-efficacy theory related to parental education is supported in literature. Young and colleagues found that two studies involved measurement of parental confidence. Moreover, significant findings from one of the two studies concluded that a multimodal education intervention contributed to increased parental confidence in regards to management of their children's fever at home.

Strengths and Limitations of the Theoretical Framework

Although the self-efficacy theory has application to this EBP project, it is not without limitations. According to research, people process, weigh, and determine their abilities based on personal experiences unique to them. Therefore, due to the variance in each individual's development of efficacy expectations, it is difficult to assume that the

new source of information will affect every individual uniformly (Bandura, 1977). It is thought that actions of individuals are influenced by their self-efficacy beliefs (de Montigny & Lacharite, 2005). Examples of this include influences on what an individual chooses to do, the amount of effort one will invest in a specific activity, and the period of time over which efforts will be maintained despite obstacles and failures. Furthermore, a display of depression symptoms, self-blaming attributions, as well as poor persistence in individuals can be attributed to low levels of efficacy. These factors may contribute to variable efficacy expectations, thereby leading to different intervention effects for each individual.

Shumaker et al. (1998) claim that the self-efficacy theory, as it applies to findings of modification of risk behaviors and promotion of healthy lifestyles, can serve as a predictor of an individual's future performance. The self-efficacy theory has been identified as having a high amount of specificity, meaning that the expectations of efficacy are not generalized, but specific to the behavior in question. Additionally, it allows one to accurately predict the magnitude and generality of behavior change in relation to efficacy expectations prompted by vicarious experiences or performance accomplishments (Bandura, 1977). The self-efficacy theory can potentially improve the HCP's understanding of why parents might practice particular behaviors related to fever in their children and help them find ways to change negative behaviors. Furthermore, these strengths make the selected theory a good fit for this EBP project.

Evidence-Based Framework: The Iowa Model of Evidence-Based Practice

Efforts to change practice should be guided by a conceptual framework (Graham, Tetroe, & the KT Theories Research Group, 2007). Nursing models of care emphasize the importance of using EBP from a patient-centered model to provide high quality care, in a supportive, mutual decision-making atmosphere (Dontje, 2007). Several useful systematic models are available to help clinicians, which serve as step-by-step guides

through the EBP process. The Iowa model has been recognized for its applicability and ease of use by clinicians from multiple disciplinary fields (Melnyk et al., 2011).

The Iowa model was developed by Maria Titler and first introduced in 1994. Since its inception, the model has been used in a variety of clinical practice settings and has been cited in more than 95 nursing journal articles (Rycroft-Malone et al., 2010). The model was originally a research utilization model, but has been updated recently to include a greater emphasis on EBP (Schmidt & Brown, 2012). Following the change, it was renamed the Iowa model of EBP to promote quality care. The Iowa model allows the clinician to focus on both knowledge and problem-focused triggers, and leads staff to question current practices and whether up-to-date evidence can improve patient care (Titler, 2006). Its framework consists of seven steps including (1) selection of a topic (2) forming a team (3) evidence retrieval (4) grading the evidence (5) developing an EBP standard (6) implementation of EBP and (7) evaluation. In addition, the flow of the algorithm depends on three key decision points (a) Is the topic a priority for the organization?, (b) Is there sufficient research base?, and (c) Is change appropriate for adoption in practice? These decision-making points allow the researcher to frequently evaluate progression of the EBP process ensuring that it continues moving forward in the appropriate direction.

Selection of a topic. In selecting a topic for EBP, several factors must first be considered. These factors include the priority and magnitude of the problem, its application to all areas of practice, its potential contribution to improving care, amount of available evidence in the problem area, the multidisciplinary nature of the problem, and buy-in from staff (Doody & Doody, 2011). The Iowa model consists of key triggers, either problem-focused or knowledge-focused, which lead the clinician in the utilization of model components further addressing these factors. Initially, the clinician formulates a question either from a problem observed within the clinical setting or from new

knowledge identified in literature, thereby leading practitioners to question current practice.

Forming a team. Once the researcher has assessed whether the topic is considered a priority for the organization, the next step is to form a team through careful consideration of persons identified as interested stakeholders (Doody et al., 2011). Achieving necessary buy-in from team members within the organization ensures relevance of the question to organizational priorities. In addition, the team should consist of stakeholders involved in the current practice. Potential team members include nurse managers, administrative team members within the organization, and staff members involved in direct patient care who also serve as excellent resources for clinical problems. A major key to successful practice change is garnering adequate support and organizational commitment from multiple system levels (Dontje, 2007; Melnyk et al., 2011).

Evidence retrieval. The third step is the performance of a thorough literature search using databases, such as CINAHL, MEDLINE, Cochrane Database of Systematic Reviews, Joanna Briggs Institute (JBI), and other electronic journals. The first databases that should be searched are ones considered to contain a high level of evidence i.e. National Guideline Clearinghouse (NGC), Cochrane, and JBI (Melnyk et al., 2011). If a systematic review is available to answer the clinical question, it will be housed within these databases. The NGC provides the researcher with information on guidelines that have already been established. Next, additional databases such as CINAHL and MEDLINE should be searched for relevant data. Finally, professional organizations such as the American Academy of Pediatrics (AAP) should also be searched for guidelines and other relevant information. The researcher should keep in mind that retrieval of the best available evidence is optimal for the purpose of gathering evidence for a well-supported EBP project. Once sufficient evidence has been collected,

the clinician, along with committed team members must critique data and synthesize findings within the literature. In the event that high-quality research evidence is not available or evidence for determining practice is insufficient, the team may resort to use of lower levels of evidence such as case reports, expert opinion, scientific principles and theory, or the team may choose to conduct further research in effort to improve evidence for practice decisions.

Grading the evidence. The next step of the Iowa model is to decide whether or not available evidence effectively answers the PICOT question. In order to determine the strength and quality of the overall body of evidence, the team of researchers must first utilize appropriate appraisal tools. One example of a tool for appraising systematic reviews is the Critical Appraisal Skills Programme (CASP) tool, which is composed of ten questions containing key criteria relevant to systematic reviews (CASP, 2003). Other examples include two evidence appraisal tools developed by John Hopkins University School of Nursing (JHNEBP), one applies to non-research and the other to research studies. In order to ensure practices are based on the most current research evidence, review protocols must be performed by the team (Doody et al., 2011).

Developing an EBP standard. After the team completes a thorough synthesis and systematic evaluation of literature, the next step is to develop a practice recommendation (Doody et al., 2011). The team takes into account patient risks and benefits when developing recommendations for practice. Feasibility, relevance, meaningfulness, and effectiveness should also be considered as the team sets guidelines for standard of practice. In addition, the team should make individual patient preferences a priority and use a patient-centered approach when developing the practice standard.

Implement the EBP. The implementation process is another key essential step of the Iowa model. A successful pilot requires adequate support from the organization,

and team members must be sure that value is placed on the integration of evidence into practice by frontline leaders and all those involved in piloting the EBP project (Doody et al., 2011). Careful and effective planning during early steps of the EBP model are likely to greatly impact the implementation phase as well as overall outcomes.

Evaluation. The seventh and final step of the Iowa model is to evaluate the effectiveness of the piloted change (Melnyk et al., 2011). Positive outcomes, which highlight the impact and contribution to improved patient care, often lead to a permanent practice change. Rollout of the practice change must continue to be evaluated periodically in order to ascertain that integration into practice results in the desired effect. If it is determined that evaluative data is not strong enough to support a practice change, quality or performance improvement monitoring is necessary to ensure high-quality care for patients.

Application of the Iowa Model to EBP Project

In applying the Iowa model to this EBP project, the first step consisted of the project manager identifying a problem-focused trigger, effects of knowledge deficit regarding fever on perceived self-efficacy of management of febrile illness and clinician observation of unrealistic fears in parents of febrile children in the office setting as well as in the emergency department. Next, a team was formed after discussing the topic with both a pediatric nurse practitioner (PNP) and medical assistants (MAs) at the clinical agency where the project was implemented. Team members consisted of a clinical advisor or PNP, three MAs, a registered nurse who also performed duties as office manager, and the doctor of nursing practice (DNP) student who served as project manager. The third step, retrieval of evidence, was performed using a thorough literature search within multiple databases i.e. JBI, Cochrane, CINAHL, MEDLINE, ERIC, and Academic Search Premier. Keywords in the search include *ped** or *paediatric* or *preschool* or *child** AND *fever* AND *educat** or *knowledge* AND *parent** or

caregiver or *carer*. In addition to evidence found in the literature, the clinical advisor also identified problems within the clinical agency related to parental knowledge deficit related to fever, which further supported the need for the EBP fever education program. The majority of clients seen within this clinical setting came from lower socioeconomic backgrounds and tended to have lower education levels. Therefore, reinforcement of education related to the topic of fever was essential for this patient population. Inclusion and exclusion criteria assisted in narrowing the literature to include relevant evidence in this project. The criteria table for evidence can be reviewed in Table 2.2.

The fourth step of the Iowa model involves grading of evidence using appropriate appraisal tools. The non-research and research evidence appraisal tools developed by John Hopkins University School of Nursing were chosen for their simplicity, efficiency, and ease of use (JHNEBP, 2005). This tool also allows rating the quality of evidence using an A, B, and C scale. Levels of evidence were determined using the Melnyk and Fineout-Overholt (2011) hierarchy of evidence pyramid as a guide. Step five includes development of an EBP standard, where literature suggests that the most effective method of educating parents on fever is a formal education strategy involving mixed methods of written, visual, and interactive material in a structured or repeated session (Young et al., 2010; Sanghavi, 2005; Baker et al., 2009). The sixth step involves implementation of the EBP project in the selected pediatric practice. This step required extensive planning, as implementation is a crucial step of the EBP project. For example, a thorough review of previous studies was performed in order to obtain a greater understanding of the best ways to carry out the implementation phase. Additionally, a conference call with a pediatrician who had successfully carried out a fever education project previously provided insight and suggestions on the plan and procedure for this EBP project. Furthermore, positive project outcomes should warrant consideration of rollout of the practice change to additional sites.

Finally, the seventh step consists of evaluating results of the EPB project. This includes determining effectiveness of the piloted change by comparing measurement outcomes from the intervention group to the control group. Measured project outcomes included parental knowledge, self-efficacy, anxiety, satisfaction, and health service utilization. Regardless of whether a project's findings are positive or negative, an important part of this step is the act of disseminating results. This action is what improves the quality of care within the discipline of advanced practice nursing and continues to drive it forward.

Strengths and Weaknesses of the Iowa Model

Strengths of the Iowa model include its ability to guide clinicians through the process of applying evidence into practice and its emphasis on driving EBP forward (Rycroft-Malone et al., 2010; Doody et al., 2011). The process is easy to follow and provides three options to choose from when there is insufficient research to guide practice (Titler et al., 2001). The model provides an algorithm, which consists of useful feedback loops allowing for modifications based on evaluative data (Melnyk et al., 2011). This speaks to the nonlinear nature of EBP and is a more practical approach to working through the EBP process. The aforementioned feedback loop involves three decision-making points: (1) whether the topic is a priority for the organization, (2) whether there is sufficient evidence, and (3) whether the change is appropriate to adopt into practice. If it is determined that the answer to a decision-making point is no, the clinician should then take appropriate steps to make a change or utilize alternative methods to carry out the project. For example, a research base that is not sufficiently developed to guide practice can be corrected by conducting further research, utilizing lower levels of evidence, or seeking out expert opinion. In addition, the model allows the clinician to focus on knowledge and problem-focused triggers, and lead staff to question current practices and whether improvements can be made using the seven steps as a guide (Doody et al.,

2011). Reavy and Tavernier (2008) cite that the model ensures that practice change is determined using a safe decision-making process as it incorporates the entire team in gathering, appraising, and evaluating the quality of available research on the chosen topic being addressed. The Iowa model considers quality improvement throughout the process as it begins with selection of a topic and continues to use baseline and follow-up data to ensure improvements within care delivery are sustained (Rycroft-Malone et al., 2010). Furthermore, Taylor-Piliae (1999) cite that the Iowa model has been successfully utilized to facilitate practice changes based on the best available evidence, and has improved patient outcomes and lowered health care costs in a variety of clinical practice settings.

One potential weakness of the Iowa model as identified by Rycroft-Malone et al. (2010) is that the model tends to have a team focus, as opposed to focusing on individual practitioners to carry out this process. Moreover, the Iowa model requires a committee to facilitate users through the EBP process. The use of a team can be seen as a barrier as reaching a consensus among a large group can be difficult, the process is often cumbersome, and costs associated with support required for the model can be costly. However, various studies utilizing the Iowa model have found that higher costs associated with the initiation of EBP could be offset by long-term effects of using the best available evidence through improvement of both quality care and cost containment (Alpen, 1996 & Taylor-Piliae, 1999). Furthermore, practice change cannot be achieved without inquiry and judicious use of best evidence to drive high quality patient care (Titler et al., 2001). Despite identified concerns associated with the Iowa model, it has been noted for having broad application to a variety of health care topics and its application has proven useful in multiple disciplines areas.

Literature Search

Search engines and keywords. The order of databases searched included JBI, NGC, Cochrane Library, CINAHL, MEDLINE via EBSCO, ERIC, and Academic Search Premier, respectively. Keywords used in the search included, *ped** or *paediatric* or *preschool* or *child**, and *fever*, and *educat** or *knowledge,* and *parent** or *caregive*r or *carer*. Limiters for the database search included scholarly, peer-reviewed journals printed in English between 2000 and 2014. One relevant systematic review was selected out of 11 total hits on the JBI database. Of the 406 total articles identified in the review, 61 articles related to this topic were assessed for eligibility. Based on inclusion and exclusion criteria, 10 final studies were included in the review ranging from 1987 to 2007. The review consisted of, (5) randomized control trials (RCTs); (1) non-randomized trial; (2) surveys, and (2) comparable cohort studies. Numerous higher level studies were excluded as it was decided the range of interventions were broad. Articles were grouped into three separate levels of educational strategies: formal, semi-formal, and informal. Additionally, outcomes such as parent knowledge, behavior, satisfaction, attitude, confidence, and concern/anxiety were assessed within the 10 selected research studies. Evidence-based clinical practice guidelines and relevant research regarding parental education of childhood fever were not identified on NGC or Cochrane Library databases during this search process. Furthermore, based on review of the titles and abstracts, 12 initial articles were selected of the total 557 hits from CINAHL, MEDLINE, ERIC, and Academic Search Premier databases. One additional article, a systematic review, was selected from the JBI database. Eight additional articles were chosen via the citation chasing technique resulting in a total of 21 articles.

Full-text versions of each of the 21 articles were obtained and the articles were reviewed more completely. Following closer examination of each selected article, the list of articles to be critiqued was further modified to include 11 relevant articles as 10 of the

articles were determined to violate inclusion criteria or fulfill exclusion criteria. One study was excluded because it involved parents of children who were hospitalized due to benign febrile convulsion and four additional studies were not included as they examined parental knowledge and practices for managing fever, but did not incorporate an educational intervention. Two of the articles were excluded because it was determined that the tools included in the study measured outdated practices such as sponging and administration of aspirin. Another study was excluded as it discussed the development of an EBP anticipatory guidance tool for parents, but failed to implement it in the article. An additional eliminated study had also been excluded by the systematic review by JBI as it reported 100% of the control group to have correctly used antipyretics, which was most likely due to a statistical analysis error. Critical appraisal of the 11 selected articles will be discussed in more detail in the section, “Appraisal of Relevant Evidence,” and are summarized in Table 2.4.

Inclusion and exclusion criteria. Inclusion criteria used in the search included evidence involving parents and/or caregivers of a pediatric patient less than or equal to 18 years of age; the use of an educational intervention in a health care setting for the purpose of increasing parental knowledge, confidence, satisfaction, and decreasing use of medical resources and parental anxiety; peer-reviewed journals printed in English between the year 2000 and 2014. Exclusion criteria consisted of those studies involving parents of children less than 30 days old, parents of children with complex illness or previous history of febrile seizure, and evidence involving surveys assessing parental knowledge without provision of education or some form of instruction.

Level/Quality of Evidence

Evaluation of levels of evidence for selected articles was based on the Melnyk and Fineout-Overholt (2011) hierarchy of evidence pyramid ranging from level I: systematic reviews or meta-analysis, to level VII: opinion of authorities and/or reports of

Table 2.1

Evidence Search Table

Database Searched	Articles Found	Duplicate Articles	Articles Reviewed	Articles Analyzed for EBP
JBI	11	0	1	1
NGC	157	0	2	0
Cochrane	13	0	0	0
CINAHL	108	0	8	5
MEDLINE via EBSCO	255	10	0	0
ERIC	5	0	0	0
Academic Search Premier	189	0	2	1
Citation Chasing	8	0	8	4
Total		10	21	11

Note. Databases are listed in order of search.

expert committees. Types of evidence selected for the development of this paper include one systematic review (level I), three randomized control trials and one randomized prospective trial (level II), one quasi-experimental (level III), two case-controls, one randomized prospective cohort study, and one prospective observational study (level IV), and one cross-sectional study (level VI). Quality of evidence for each article was appraised using the Johns Hopkins Nursing Evidence-Based Practice Tool (JHNEBP). A non-research evidence appraisal tool was used for the systematic review, whereas a research evidence appraisal tool was used for the remainder of the studies selected for this EBP project. The JHNEBP quality of evidence tool consists of three scores for quality rating: high (A), good (B), and low/major flaws (C). Seven of the articles selected for appraisal received an "A" rating and four of the articles received a "B" rating due to the lack of randomizing the selection of subjects and for failing to include a control group; one of the "B" rated articles failed to discuss limitations, while another article did not utilize an intervention. None of the selected studies received a "C" rating per the investigator. A summary of the levels of evidence for selected articles can be viewed in Table 2.3.

Appraisal of Relevant Evidence

According to Melynk and Fineout-Overholt (2011), critical appraisal of evidence is a crucial step in the EBP process. The evidence obtained throughout this literature search and critical appraisal helped the project manager in preparing the design and implementation of a project regarding parental education of childhood fever. The importance of effectively critically appraising evidence cannot be overstated and authors explain that this can be accomplished by answering three key questions related to validity, reliability, and applicability of the selected studies. These key questions aided in determining the quality of evidence available on the topic of childhood fever.

Table 2.2

Criteria Table for Evidence

Inclusion Criteria	Exclusion Criteria
Subjects are caregivers of a pediatric patient less than or equal to 18 years of age	Subjects are parents of children less than 30 days old or parents of children with previous febrile seizure or complex illness
Printed in English	Printed in language other than English
Published between 2000 and 2014	Published over 15 years ago
Setting in a hospital or medical office	Setting other than hospital or medical office
Use of an educational intervention to increase fever knowledge, parental confidence, and/or decrease utilization of medical services or parental anxiety	Assesses parental knowledge, confidence, or anxiety without provision of education or some form of instruction

Table 2.3

Levels of Evidence

Author(s)	Level of Evidence	Database
Baker et al. (2009)	IV	CINHAL
Barnsteiner (2001)	II	Citation Chasing
Bloch & Bloch (2013)	II	CINHAL
Broome et al. (2003)	II	Citation Chasing
Chang et al. (2011)	VI	Academic Search Premier
Fieldston et al. (2013)	III	CINHAL
Herman et al. (2009)	IV	CINHAL
Samuels-Kalow et al. (2013)	IV	CINHAL
Sarrell & Kahan (2003)	IV	Citation Chasing
Yin et al. (2008)	II	Citation Chasing
Young et al. (2010)	I	JBI

Note. Adapted from “Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions” by B. M. Melynk and E. Fineout-Overholt, 2011. *Evidenced-Based Practice,* p. 12. Copyright 2011 by Lippincott Williams & Wilkins.

Evidence levels for this project were determined using the seven levels of Hierarchy of Evidence from Melynk and Fineout-Overholt (2011): (a) level I is evidence obtained from a systematic review or meta-analysis of random controlled trials, (b) level II is evidence from a well-designed random control trial, (c) level III is evidence from well-designed controlled trials without randomization, (d) level IV is evidence from a well-designed case-control and cohort studies, (e) level V is evidence from systematic reviews of descriptive and qualitative studies, (f) level VI is evidence from single descriptive or qualitative studies and, (g) level VII is evidence from the opinion of authorities and/or reports of expert opinions. As mentioned previously, the quality of evidence for each article was appraised using the JHNEBP research and non-research tools.

Level I evidence. One systematic review on the topic of parental fever education was identified in the literature. Young et al. (2010) sought to determine what educational interventions were effective in influencing parents to provide effective care for their febrile children. The authors had two review questions in mind during their search: what types of educational programs have been demonstrated to be effective? and what are appropriate formats and timings of information delivery?. Young et al. (2010) concluded that a multimodal educational program consisting of mixed methods of written, visual, interactive, and verbal material in a structured session was proven effective in improving parental knowledge of fever management in children. Informal strategies, including one-dimensional methods such as written material, were not effective in improving parental management of fever in their child. Conclusions were clearly stated within the review and evidence was high quality based on the non-research JHNEBP appraisal tool.

Level II evidence. Four research articles used in this EBP project came from level II evidence. A study by Bloch & Bloch (2013) incorporated video discharge

instructions as an adjunct to standard written instructions as a way to improve caregivers' understanding of their child's discharge plan from the ED. Forty-two percent of the intervention group compared to 29% of the control group rated their discharge instructions as being helpful. The study received an "A" rating as it had a strong design and resulted in significant findings. The limitations for this study were identified, but discussion was minimal. A significant improvement was observed in a randomized control trial (Yin et al., 2008), where an education method using pictogram-based medication instruction sheets was evaluated with 122 intervention subjects, 5.4% from the intervention group gave inaccurate doses of medications compared to 47.8% of 122 control subjects who received standard medication counseling. In a randomized quasi-experimental study by Liebman & Barnsteiner (2001), a fever education program was implemented using control and intervention groups from a sample size of 87 parents of children aged 3 months to 5 years. Using the CRUNCH Software package, statistical analyses were performed, and it was determined that both the standard fever education program and the interactive fever program were equally effective at decreasing anxiety. Limitations of this study were not clearly discussed within this study, and it is likely that results would have improved with a larger sample size.

Broome et al. (2003) performed a randomized prospective study exploring the effectiveness of fever management education in increasing parental knowledge, confidence, comfort, and satisfaction. Authors developed an educational intervention using the Check-Assess-Lower-Monitor (CALM) approach. A sample size of 124 parents of children ages 3 months to 80 months was used for the study, and the study design consisted of one control group and two intervention groups (CALM1 & CALM2). The CALM1 group received a video and brochure as they left the office and the CALM2 group was shown the video and brochure in the office prior to seeing their HCP. The study was implemented at six different sites and results revealed that knowledge scores

at 48 hours and 1-month post visit were significantly higher in both CALM groups as compared to the control group. Additionally, all three groups had high satisfaction, comfort, and confidence levels at all three points where measurement outcomes were evaluated.

Level III evidence. Fieldston et al. (2013) performed a quasi-experimental study including pre-intervention and post-intervention for a group of 32 caregivers of children aged seven months to five years. The objective was to evaluate the impact of an education and training intervention regarding management of common childhood illnesses on caregiver knowledge. Although, the study used a small sample that was not necessarily generalizable, the findings did prove the education and training were effective since knowledge scores immediately following the intervention improved from pre-intervention, 55% to post-intervention, 77%. This particular study consisted of a 90-minute educational activity, which addressed management of fever, colds, and minor trauma in children at home. Despite the positive outcomes of the study, it is not a practical design for further use and therefore, provided minimal assistance in planning for this EBP project.

Level IV evidence. Informal strategies, including one-dimensional methods such as written material, were not effective in improving parental management of fever in their child; however they were effective in decreasing anxiety and improving satisfaction (Young et al., 2010). Another key finding was that knowledge alone is not the only necessary factor in predicting parental behaviors, but attitudes of fever and health also played a significant role in influencing parents' decisions regarding management of their child's fever. Baker et al. (2009) further validated this finding in a randomized prospective cohort study, which was the largest study of its kind with the longest follow-up period to date. Baker et al. (2009) explained, "Our results suggests that although knowledge about fever was improved, behavior relating to emergency department use

was unaffected by the educational video. This finding is in accordance with theories about health behavior such as the health belief model that people rarely make health changes based on knowledge alone" (p. 567). This study received a high quality rating as it included an adequate sample size, participants were selected at random, results of the study were clearly explicated, and limitations were discussed.

Herman et al. (2009) conducted a study aiming to measure the impact of a simple parent health literacy intervention on ED and primary care clinic usage patterns. Ninety-four percent of subjects had increased levels of parental confidence following the intervention and 16% of subjects stated their first course of action when their child is sick would be to refer to the health book provided and the percentage stating they would go to the ED decreased by 34% following the intervention. The study failed to include an intervention group; however, it was a well-designed study and included an adequate sample size.

Samuels-Kalow, Stack, & Porter (2013) performed a prospective observational study examining the relationship between language and discharge comprehension regarding medication dosing. Findings of the study included 32% of subjects with dosing errors and 54% of Spanish-speaking parents with dosing errors, as compared with 25% of English-speaking parents. This study included an adequate sample size, which consisted of 210 parent-child dyads; however, it received a "B" rating due to its failure to include an intervention and control group.

Level VI evidence. Chang et al. (2011) performed a cross-sectional study where authors sought to better understand the level of comprehension of written medication instruction among caregivers with febrile children. The sample size consisted of 102 caregivers with febrile children less than 6 years old. After reading the medication instructions, one-third of the participants had more than one misunderstanding of the medication instructions and nearly two-thirds misunderstood the

side effects associated with acetaminophen. Additionally, the researchers found that poorer academic backgrounds were associated with poorer comprehension of the instructions provided. An intervention intended to increase participant knowledge was not utilized in this particular study, which contributes to the quality grading of a “B” per the JHNEBP appraisal tool.

In determining reliability of evidence, each of the 11 research studies noted improvement after the intervention and more than half of those studies also received an “A” rating for overall high quality. After careful evaluation of the quality of each study as well as the effectiveness of the intervention as indicated by study results, the selection of articles was considered reliable. Thus, although studies specific to the topic of fever education were somewhat limited, the overall quality of evidence for the relevant articles selected are considered to be high or good. Just five of the 10 research studies were randomized. One systematic review evaluating the effectiveness of ten relevant studies involving educational strategies regarding parental fever management was found. However, all of the research studies utilized an adequate sample size, all but two studies used an intervention, and more than half of the intervention studies also included a control group. A few of the studies collected subjects using convenience sampling methods; however, each study involving intervention trials randomly assigned subjects to either the intervention or control group. The majority of studies selected for appraisal took appropriate steps to assure that both the intervention and control group received the same treatment. Overall, chosen research methods were appropriate and effective. Given these findings, it has been determined that evidence obtained for this EBP project is applicable to the topic of parental fever education and supports the use of a multimodal fever educational intervention.

Table 2.4

Summary of Evidence

Author(s), Publication Title	Population, Setting	Design/ Evidence Level Intervention(s)/ Comparisons	Findings/ Recommendations	Appraisal/ Quality Rating
Baker et al. (2009) Pediatric Emergency Care Effectiveness of fever education in a pediatric emergency department	• 280 parents of children ages 3-36 months • Urban pediatric emergency department	• Randomized prospective cohort study/ Level IV • Intervention group: Educational video regarding fever • Control group: Educational video on home and automobile safety	• Pretest/posttest intervention group had 54% reduction in respondents who reported fever was dangerous by itself and 30% improvement in respondents who correctly identified aspirin (ASA) as an inappropriate therapy for childhood fever • The control group showed no improvement with these questions. • No difference in either group regarding the return of febrile ED visits	• Appraisal: Strengths of the study included adequate sample size, good design-participants were randomized and intervention/control groups were equally treated, considered high level of evidence. Results clear, interpretation provided and limitations discussed. • Quality rating: A High
Bloch & Bloch (2013) Pediatric Emergency Care	• 341 caregivers • Academic pediatric emergency department	• Randomized control trial/ Level II • Intervention group: watched a 3-minute video based on their	• Video discharge instructions increased caregiver knowledge compared with written discharge instructions alone	• Appraisal: Strengths-adequate/appropriate sample size. Good design-RCT. Consisted of both control and

Using video discharge instructions as an adjunct to standard written instructions improved caregivers' understanding of their child's emergency department visit, plan, and follow-up		child's diagnosis • Control group: received standard paper discharge instructions for their respective diagnosis	• 42% of the intervention group compared to 29% of the control group rated their discharge instructions as being extremely helpful	intervention group. Conclusions were based on clearly presented results and findings were significant. Limitations were minimal, but were identified and discussed. • Quality rating: A High
Broome et al. (2003) Journal of Pediatric Health Care A study of parent/grandparent education for managing a febrile illness using the CALM approach	• 124 parents/ grandparents of children 3 months to 80 months • 6 sites: 2 private practices and 3 ambulatory clinics in children's hospitals and 1 ambulatory clinic in an academic medical center	• Randomized prospective study/ Level II • Control: received standard care on fever management • Intervention group 1 (CALM1): received a video and brochure about fever management as they left the site • Intervention group 2 (CALM2): watched the fever management video and were given the brochure before seeing their healthcare provider	• Knowledge scores at 48 hours and 1-month post-visit were significantly higher in the CALM groups as compared to the control group. • Parents in both CALM groups were highly satisfied with the education they received • Satisfaction, comfort, and confidence of all three groups were high at all three points.	• Appraisal: Strengths include study design and randomization of subjects into either control or intervention group. Sample size was adequate and each group received same treatment besides the intervention. A weakness of the study included a poor presentation of results, as findings were not clearly identified in one location. • Quality Rating: A High

Chang et al. (2011) Journal of Clinical Nursing Knowledge of using acetaminophen syrup and comprehension of written medication instruction among caregivers with febrile children	• 102 caregivers with febrile children ≤ 6 years old • Febrile/hospitalized children at a medical center	• Cross-sectional study/ Level VI • Survey of approaches to fever management prior to hospital admission & knowledge and comprehension of antipyretic medication administration specific to provided written instruction	• 24.5-30.4% of caregivers misunderstood at least one item among the drug time, duration and dosage information • 43.1% did not know the meaning of the medication side effect hepatotoxin	• Appraisal: Strengths of the study include a good study design and adequate sample size. One weakness was that the study did not include an intervention, although it did evaluate comprehension of written instructions. • Quality Rating: B Good
Fieldston et al. (2013) Pediatric Emergency Care Effects of an education and training intervention on caregiver knowledge of non-urgent pediatric complaints and on child health services utilization	• 32 caregivers of urban children aged 7 months to 5 years • 4 urban primary care centers of a large children's hospital	• Quasi-experimental/ Level III • Pre-intervention/ Post intervention study • Caregiver knowledge before, immediately after, and 6 months post intervention tested using written instrument • Health services utilization was collected 6 months before and after intervention • Intervention: 90-minute educational activity addressing management of fever,	• Intervention increased knowledge (55% pre-intervention to 77% immediately following the intervention) • Among 20 participants who completed the 6-month follow up test, scores declined from 79% immediately following intervention to 71%, but remained higher than before intervention (61%) • There was an increase in after-hour telephone use and no significant	• Appraisal: Strengths of the study include the recruitment of sample from multiple sites; however, it was small and not generalizable. Also, the intervention was not very practical considering it took 90 minutes. • Quality Rating: B Good

		colds, and minor trauma in children at home	decrease in ED use following the intervention	
Herman et al. (2009) Pediatric Emergency Care Impact of a health literacy intervention on pediatric emergency department use	• 113 parents of children with mean age of sample size 48 months • Large medical center pediatric ED	• Case-control/ Level IV • Pre-intervention questionnaire/ 6 month follow-up post-intervention questionnaire • Intervention: Parents were given a children's health aid book and instructed on its use for 5-10 minutes	• 61 parents were successfully contacted for the 6 months follow-up • 16% (up from 1% prior to intervention) stated their first course of action for child sickness would be to consult a health book, 93% had used the book at least once, 89% found it easy to use, and 94% were more confident in caring for their children	• Appraisal: Strengths include adequate sample size and well designed study; however, the study did not contain a control group and outcomes measured were limited to parent opinion regarding ED use in certain hypothetical situations and course of action regarding sick child and use of "health book" provided to all participants. Study did find that parental confidence improved significantly. • Quality Rating: A High

Liebman & Barnsteiner (2001) Pediatric Emergency Care Fever education: Does it reduce parent fever anxiety?	• 87 parents of children aged 3 months to 5 years • Large urban pediatric emergency department	• Randomized quasi-experimental/ Level II • Pre-test/Post-test examining parental fever anxiety • Control group: received the Standard Fever Education Program (included a fever pamphlet) • Intervention group: received the Interactive Fever Program (included an interactive discussion, review of fever pamphlet, discussion of parents' questions and concerns, and instruction and demonstration in correct use of a thermometer)	• Both the standard fever education program and the interactive fever program were equally effective teaching methods as data revealed a 30% reduction in fever anxiety rated as moderate-severe on arrival to non-low post fever education. • 40% of parents reported moderate to high levels of anxiety related to their child's fever on arrival to ED and post-intervention anxiety levels reduced to 82% (intervention group) and 85% (control group)	• Appraisal: Strengths of the study included the study design-randomized and study included both intervention and control group. Weaknesses included that few limitations were discussed and although sample size was adequate to achieve significant results it could have been improved with more subjects. • Quality Rating: A High
Samuels-Kalow, Stack, & Porter (2013) Pediatric Emergency Care Parental language and dosing errors after discharge	• 210 parent-child dyads • A single tertiary care pediatric ED	• Prospective observational/ Level IV • All subjects completed a post-discharge interview, which assessed their comprehension regarding medication dosing of	• 46 parents or 32% had an acetaminophen dosing error • 54% of Spanish-speaking parents had a dosing error, as compared with 25% of English-speaking parents	• Appraisal: Strengths of this study include sample size and design, although it was a lower level of evidence. Weaknesses include failure to include intervention; therefore,

from the pediatric emergency department		acetaminophen • 146 of the discharges were observed and 110 of the subjects were identified as English speaking and 35 were identified as Spanish speaking		it also lacked a control group. Findings were significant and identified need for additional instruction rather than written discharge instructions alone. • Quality Rating: B Good
Sarrell & Kahan (2003) Patient Education and Counseling Impact of a single-session education program on parental knowledge of and approach to childhood fever	• 156 parents of children aged 3 months- 18 years • "sick child" visit at pediatricians office setting	• Case-control/ Level IV • First visit included a standard short explanation of fever was given by the pediatrician • Second visit consisted of a reinforced educational session including discussion supported by written and pictorial material • Each educational intervention was followed up by a questionnaire at the following examination 3-7 days later	• Reinforced educational session involving discussion, written, and pictorial material resulted in a significant increase in knowledge of childhood fever	• Appraisal: Strengths include large sample size and that the study utilized an intervention; however, investigators failed to include a control group. Also, limitations were not clearly identified/discussed. • Quality Rating: B Good
Yin et al. (2008) Archives of	• 245 randomized caregivers of children 30 days to	• Randomized control trial • Intervention: Medication counseling using plain	• 5.4% from the intervention group gave inaccurate doses	• Appraisal: Strengths of this study include the study design, large

Pediatrics & Adolescent Medicine Random controlled trial of a pictogram-based intervention to reduce liquid medication dosing errors and improve adherence among caregivers of young children	8 years • Urban public hospital emergency department	language, pictogram-based medication instruction sheets • Control: Standard medication counseling	of medications compared with 47.8% of the control group • Intervention improved medication adherence & dosage accuracy with medication counseling using plain language pictogram-based medication instruction sheets (non-adherence 9.3% intervention group vs. 38% of control group)	sample size, and included both an intervention and control group. Findings were significant and limitations were adequately discussed. • Quality Rating: A High
Young et al. (2010) JBI Library of Systematic Reviews The effectiveness of educational strategies in improving parental/caregiver management of fever in their child: A systematic review	• Parents and caregivers of children aged 3 months -12 years • Sample sizes ranged from 70 to 500 participants	• Systematic Review of studies conducted between 1987- 2007 • 10 studies met eligibility criteria • Types of studies in the review included clinical trials, cohort studies, and surveys • Review determined effectiveness of 3 levels of educational strategies: formal, semi-formal, and informal education	• Best practice was considered formal education (mixed methods of written, visual, interactive and verbal material) in a structured or repeated session • Semi-formal educational interventions were effective, but results were not as evident after 6 months • Informal education was not effective in improving knowledge	• Appraisal: Strengths of the review include objective was clearly stated and search strategy was appropriate and reproducible. In addition, details of included studies were presented and reasoning for excluded studies was also provided. • Quality Rating: A High

*Level of evidence rating based on Melnyk Pyramid and quality grading based on JHNEBP Research Evidence Appraisal and JHNEBP Non-Research Evidence Appraisal tools created by The Johns Hopkins Hospital and The Johns Hopkins University

Synthesis of Literature to Support Recommendation

Selected studies clearly demonstrated that implementation of an educational intervention was feasible within a clinic or pediatric practice setting. Two of the eleven studies took place in a pediatric clinic or at a pediatrician's office setting. One of the studies involved collecting subjects at well child visits (Sanghavi, 2005); whereas, researchers from the other study chose to collect subjects during sick visits; thereby, allowing researchers to provide education relevant to the current situation (Sarrell & Kahan, 2003). Researchers found that educational interventions delivered by health care providers in close proximity to the time of the fever were more effective in improving parental management of febrile children (Young et al., 2010). Benefits of using the evidence obtained for the implementation of the proposed EBP project as an adjunct to additional research regarding fever recommendations include increasing parental knowledge of fever, decreasing parental misconceptions of fever in their child, decreasing the potential for overmedicating febrile children, and decreasing anxiety caused by their child's fever, and utilization of health services by increasing parental self-efficacy regarding appropriate management of childhood fever (Young et al., 2010; Broome et al., 2003; O'Neill-Murphy et al., 2001; Baker et al., 2009; Herman et al., 2009).

Based on the best available evidence in literature, the most effective method of educating parents on fever and its correlates is a formal education strategy which involves mixed methods of written, visual, and interactive material in a structured or repeated session (Young et al., 2010; Sanghavi, 2005; Baker et al., 2009). The literature indicated that the timing of the educational session was also an important factor, as interventions were found to be more effective when presented in close proximity to or around the time of the presentation of fever (Young et al., 2010; Sarrell & Kahan, 2003). Additionally, informal strategies including one-dimensional methods,

such as written material were not effective strategies for improvement of parental management of fever in their child (Young et al., 2010). As researchers measuring the use of medical resources, i.e. calls to the pediatrician, emergency room visits, and inappropriate “sick visits” in clinics and pediatrician offices, have found, increased knowledge regarding fever does not have a significant effect on behaviors related to management of fever. Mitigation of fever phobia has the potential to lead to decreased anxiety related to morbidities and mortalities often associated with fever by parents. Thus, improving fever literacy among parents of pediatric patients has the potential to reduce the incidence of unrealistic fears regarding fever, thereby, impacting safer use of antipyretics.

Best Practice Model Recommendation

After careful review of literature, a multimodal fever education program was established in effort to encourage safe and appropriate management of febrile children. The literature supported use of multidimensional educational interventions as effective methods in changing parental management of fever (Young et al., 2010; Liebman & Barnsteiner, 2001; Bloch & Bloch, 2013). Additionally, educational interventions provided within close proximity to the time of fever have proven to be more effective in improving parental management of fever in their child (Young et al., 2010). The AAP is acknowledged as a reliable source for trusted advice for parents as well as HCPs; therefore, credible multimedia educational resources available through the American Academy of Pediatrics (AAP) in the form of video and written brochure were utilized. The video was found on a patient-oriented website, HealthyChildren.org, which provided parents with evidence-based health advice and the brochures served as a supplement for parents as it reinforced key concepts covered in the video. Outcomes including parental fever knowledge, confidence related to the management of childhood fever, and

anxiety related to childhood fever were observed throughout the implementation phase. In addition, parental satisfaction of the educational intervention was also examined. It was hypothesized that the aforementioned strategies for the multimodal fever education program directed towards parents could potentially impact parental knowledge and self-efficacy related to management of fever in the pediatric population, increase parental satisfaction with educational methods, as well as reduce ED visits for fever as a result of lowered anxiety levels. Refer to table 2.5 for the best practice guideline for parental fever education.

Table 2.5

"Best Practice" Guideline for Parental Fever Education

Plan	Evidence Supporting Plan	Procedure/Goals
Implement a multimodal fever education program in a pediatric office setting	Literature supports use of multi-dimensional educational interventions as effective methods in impacting parental management of fever.	Recruit 100 subjects through convenience sample and randomly assign participants to control or intervention group. The project will take place over a 19-week period.
Evaluate outcome measurements including parental knowledge, anxiety, self-efficacy, satisfaction, and health service utilization	A JBI systematic review cited parental knowledge, parental behavior, satisfaction of education provided, attitude and confidence, and concern and anxiety as commonly measured outcomes related to parental fever education (Young et al., 2010).	Parental knowledge, self-efficacy, and satisfaction will increase in the intervention group. Reported parental anxiety and health service utilization will decrease following the intervention.
Provide educational materials from a credible source and communications from HCP should be clear.	Literature surrounding the theory of self-efficacy supports the notion that information obtained from a credible source is likely to have a greater impact on the construct, verbal persuasion as it relates to parental self-efficacy.	Fever video obtained through AAP healthychildren.org website and "Fever and Your Child" brochure purchased through AAP educational department. Materials along with verbal discussion by the NP will be provided to the intervention group during a single office visit.
Provide education in close proximity to the time of fever presentation.	Literature supports the notion that the timing of education where it is relevant to current situations have proven more effective in improving parental management of fever in their children.	Parents presented with chief complaint of fever in their children will be invited to join the study. It is anticipated that due to increased interest the parents will gain more from the intervention; thereby, making a stronger more lasting impact.

CHAPTER 3

IMPLEMENTATION OF PRACTICE CHANGE

Sample and Setting

The setting for this EBP project took place at a private pediatric practice of approximately 4000 patients situated in Northwest Indiana. The chosen setting consisted of three clinical sites and included two providers, a pediatrician and a pediatric nurse practitioner. The pediatric nurse practitioner worked with two medical assistants and served as clinical advisor during the implementation phase of the EBP project. Participants for this study were recruited over a period of 19 weeks, and included parents of children ranging in age from six months to five years who presented with a complaint of fever in their child.

Recruitment of Subjects

Subjects were recruited using convenience sampling, where parents who presented with complaints of febrile children and met specified criteria were asked to participate in the study. Qualifying criteria included a parent or caregiver of a child between the age of six months to five years who were fluent in the English language presenting with complaint of fever in their child and no previous history of febrile seizures or a serious medical condition. Exclusion criteria included parents presenting with a child younger than six months or older than five years, who were not fluent in English or did not present with complaint of fever in their child, or whose child had a previous history of febrile seizures or a serious medical condition. Control and intervention groups were recruited on separate days and selection of subjects was not randomized for feasibility of project implementation, as this was a busy practice. Participants were offered a modest incentive of a five-dollar Walmart gift card as an expression of gratitude from the investigator for their participation.

Outcomes

The purpose of this EBP project was to implement a multimodal education program on fever and its appropriate management, and to examine its effects on parental knowledge and self-efficacy regarding management of childhood fever, anxiety related to their child's fever, health service utilization i.e. ED visits, as well as satisfaction of the education provided. Outcomes were measured using a fever management questionnaire (FMQ) and included four measurement outcomes: knowledge, parental confidence, anxiety, and fever knowledge. Items for the FMQ were adapted from three separate questionnaires previously used in published studies. Thirteen questions adapted from a study by Broome et al. (2003) had a test-retest reliability of 0.78 and a reliability estimate ranging from 0.92 to 0.94. A 5-point Lickert Anxiety Face scale was adopted from a previous study; however, reliability and validity were not available per the author of the tool. The remaining 3 questions were adapted from a study by Robinson et al. (1989) and reliability and validity were not available per the author of the tool. The satisfaction survey had not been used previously; therefore, reliability and validity were not available for the tool.

Implementation

The intervention included a three-minute educational video on childhood fever and appropriate management obtained from healthychildren.org website and developed through the American Academy of Pediatrics (AAP). The video was started by the project manager for intervention group participants in the exam room prior to their child being evaluated by the HCP. Following the viewing of the video and once the HCP entered the room, an educational pamphlet obtained through the AAP entitled, "Fever and Your Child," was provided to intervention group participants. In addition, participants engaged in a brief verbal discussion regarding information discussed in the video and the AAP fever pamphlet with the HCP during the visit. The control group

participants received standard education consisting of a brief discussion regarding fever management with the HCP during the appointment. The HCP kept a running list of ED visit notifications for subjects as they appeared on patient electronic records. Both the control group and intervention group were asked to complete a demographics sheet prior to their child's visit with the HCP. Following their child's appointment, each of the participants completed a 17-item FMQ. In addition, participants were given a satisfaction survey regarding the education provided towards the latter part of the visit and were then asked to complete the survey and mail it back within one to two weeks. Two separate surveys were created pertaining to the education provided in either the intervention or control group. The satisfaction survey for the intervention group included nine items mostly pertaining to the video and pamphlet, whereas the control group survey consisted of only six questions regarding their preferences with parental education. Due to a lack of compliance regarding return of satisfaction surveys, a majority of participants in both control and intervention groups were contacted via phone and provided satisfaction feedback in this manner.

Planning

Permission to implement the fever education project was granted by the pediatric office manager and pediatrician during the spring of 2014, and approval from the institutional review board (IRB) at Valparaiso University was obtained on September 5, 2014. A fever management/parental confidence questionnaire was adopted from a previous study after permission for use was granted on July 20, 2014 (M. Broome, Personal Communication, July 20, 2014). In addition, permission to use a parental fever anxiety scale was granted from the developer of the tool on July 14, 2014 (J. Barnsteiner, Personal Communication, July 14, 2014). A three-minute video on childhood fever was obtained through the healthychildren.org website and "Fever and Your Child," pamphlets were purchased through the AAP as selected materials for the

multimodal educational intervention. An email communication with an AAP editorial specialist regarding use of the video revealed that the information on the website, including the fever video, was public domain and actually encouraged for use in this manner (A. Cozza, Personal Communication, July 21, 2014).

Protection of Human Subjects

Participation in the educational intervention was completely voluntary and participants were given the opportunity to end participation at any time throughout the study. The decision to participate was left to the parent and had no impact on the care received from the HCP and other medical staff at the site. Also, participants had the freedom to skip any questions they preferred not to answer. Benefits of participating in the project were greater than risks as there were no known risks with participation in the EBP project. Collected project data were stored in a safe and kept in the investigators possession at all times. After completion of the project, all identifiable data were disposed of appropriately. Additionally, demographic data collected did not include any identifying information and all data collected were reported as an aggregate.

CHAPTER 4

FINDINGS

Following the implementation phase of the EBP project examining the effects of multimodal fever education on parents of febrile children, the data were analyzed to test for significance. Specific outcomes measured during the implementation phase included knowledge, self-efficacy, anxiety, health service utilization, and satisfaction. Demographic information from the sample was also compared to identify any significant differences between the control and intervention group. Analysis for reliability of each tool was also performed and will be explicated towards the latter portion of this chapter.

Sample Characteristics

A total of 40 participants at the clinical agency met inclusion criteria and agreed to partake in the EBP project. The sample was comprised of two similar groups; however, one significant difference between the two groups was identified (see Table 4.1). A significant difference between the control and intervention group was found for the number of ED visits for fever (X^2 (2) = 7.436, p = < 0.05). A greater percentage of participants from the intervention group claimed to utilize the ED for fever as compared to the control group. The intervention group consisted of 20 participants, 18 females and 2 males, and the control group consisted of 20 participants, all females. Age of individuals ranged from 19 to 36 years for the control group and 21 to 56 years for the intervention group. Furthermore, the mean age for the control group was 27 years, whereas the mean age for the intervention group was 30 years. The majority of participants from both groups described their marital status as single, accounting for 60% of individuals from the control group and 45% of individuals from the intervention group. Those who identified themselves as married from the control group and intervention group were 25% and 30%, respectively. Sixty percent of individuals from the control group identified themselves as Caucasian as compared to

Table 4.1

Demographic of Participants

Demographic	Control n (%)	Intervention n (%)	X^2	df	*p*value
Number of Participants	20 (100)	20 (100)			
Sex					
Female	20 (100)	18 (90)	2.105	1	.147
Male	0 (0)	2 (10)			
Age					
18-30 years	14 (70)	14 (70)	3.477	3	.324
31-40 years	5 (25)	3 (15)			
41-50 years	0 (0)	1 (5)			
51+ years	0 (0)	1 (5)			
Marital status					
Single	12 (60)	9 (45)	3.186	4	.527
Married	5 (25)	6 (30)			
Separated	1 (5)	0 (0)			
Divorced	2 (10)	4 (20)			
Other	0 (0)	1 (5)			
Race					
Caucasian	12 (60)	17 (85)	4.662	3	.198
Hispanic	2 (10)	2 (10)			
African American	4 (20)	1 (5)			
Other	2 (10)	0 (0)			
Education					
9^{th}-12^{th} Grade	4 (20)	1 (5)	8.952	4	.062
High School Diploma Or GED	4 (20)	7 (35)			
Some College	10 (50)	6 (30)			
Associate's Degree	0 (0)	5 (25)			
Bachelor's Degree	2 (10)	1 (5)			
Income					
Participants	14	15		27	.238
Mean	32811.4286	66453.6000			
Birth order					
First Child	11 (55)	11 (55)	1.311	3	.726
Second Child	2 (10)	3 (15)			
Third Child	3 (15)	1 (5)			
Other	4 (20)	5 (25)			

Total Children					
Total Participants	18	20		2	.457
1 child	8	8			
2-3 children	6	10			
4+ children	4	2			
Advice Source					
Pediatrician	12 (60)	14 (70)	2.154	3	.541
Emergency Dept.	2 (10)	0 (0)			
Relative or Friend	2 (10)	2 (10)			
Other	4 (20)	4 (20)			
Fever ED Visit					
None	14 (70)	10 (50)	7.436	2	.024*
Once	3 (15)	0 (0)			
2-3 Times	3 (15)	10 (50)			
MD Fever					
None	4 (20)	1 (5)	3.387	3	.336
2-3 Times	9 (45)	14 (70)			
3-4 Times	5 (25)	3 (15)			
5 or more times	2 (10)	2 (10)			

*$p<0.05$

10% Hispanic, 20% African American, or 10% other. The majority of the intervention group was also comprised of 85% Caucasian individuals, 10% Hispanics, and 5% African Americans. In respect to highest level of education, the majority of control participants had either completed high school or some college for 20% and 50%, respectively. The educational background of intervention subjects was similar with 35% who completed high school and 30% who had some college. Average income for the control group was $32,811, whereas average income for the intervention group was $66,453, which was not a significant difference (X^2 (27) = -1.118, p > .05). As mentioned previously, calculations using a chi-square test of independence revealed no significant difference between the control and intervention groups on gender (X^2 (1) = 2.105, p > .05), age (X^2 (3) = 3.477, p > .05), education (X^2 (4) = 8.952, p > .05), marital status (X^2 (4) = 3.186, p > .05), or race (X^2 (3) = 4.662, p > .05).

In addition to general demographic data, participants were asked to provide further details regarding their children and current management of fever such as, main advice source on the topic of fever and number of visits to the ED or doctor office for fever in the past year. The average total number of children for the control group participants was 2.28 children. Intervention group participants had an average of 2.05 children. For the birth order category, an equal number of participants in the control and intervention group presented to the office due to a fever complaint involving the first child, a total of 55% in both groups. The majority of participants from each group claimed to rely on their pediatrician or primary care physician (PCP) for fever advice, comprising of 60% of the control group and 70% of the intervention group, followed by 20% other, and 10% relative or friend for each of the two groups. Additionally, 10% of the control group claimed the ED was their main source of advice for fever. As mentioned previously a significant difference between the two groups was identified for participants who claimed to utilize the ED for fever. Seventy percent of the control group

stated they had not utilized the ED for fever visits, as compared to 15% for once and 15% 2-3 times. Fifty percent of the intervention group claimed not to have utilized the ED for fever visits, as compared to 50% 2-3 times. Analysis of participants who claimed to utilize the PCP for fever visits did not reveal significant findings (X^2 (3) = 3.387, p >0.05), as forty-five percent of the control group claimed to utilize the PCP office 2-3 times in the past year for fever visits while 70% of the intervention group selected 2-3 times as a response. The next most popular response for the control group included 25% 3-4 times, followed by 20% none, and 10% 5 or more times. The intervention group also had a higher percentage with 15% 3-4 times, followed by 10% 2 times, and 5% none.

Changes in Outcomes

Statistical testing. The PICOT question for this EBP project was, "In parents of children age six months to five years, what is the effect of a multimodal educational intervention on childhood fever and its management, on knowledge, anxiety, parental confidence, satisfaction, and health service utilization, as compared to standard educational methods for fever, over the course of 19 weeks?" Thus, to determine the effectiveness of the multimodal fever education, four separate tools were utilized to gather the outcome data. Health service utilization of participants was tabulated from ED visits per the clinical advisor, as this information would appear once each shift for the participant's children. Insufficient data were collected as this information pertained to less than 10% of participants, thus it was decided to eliminate this outcome of measurement. Furthermore, an analysis was conducted for knowledge, self-efficacy, anxiety and satisfaction using the Chi-square test to compare the results of control and intervention groups (see Table 4.2). Statistical significance for all analysis was defined as p< 0.05.

The fever management questionnaire consisted of a total of 21 questions: 6 multiple choice questions, 5 select all that apply questions, 4 true/false questions, and 3 Lickert scale questions. Code names were assigned to each question for analysis purposes. Code names included in table 4.2 will be explicated within this section. Multiple choice questions consisted of the code name “oraltemp” representing the question, “How old should a child be when you a take a temperature in the mouth?”; “elevTEMP” for “Which one of the following temperatures is above normal no matter where you take it?”; “defFEVER” for “In a child older than 3 months of age, which of the following is considered a fever?”; “amtMED” for “Look at the chart: How much fever medicine would you give your child if he/she had a fever?”; “fCAUSES” for “Fever often causes…”; and “fev/infec” for “Which of the following about fevers and infection is true?.” Select all that apply coding included “callMD” representing “When do you need to call your child’s doctor or nurse?”; “s/sCALL” for “Imagine your child has a fever. Which of the following signs or symptoms means you should call your child’s doctor right away?”; “ReduceTEMP” for “To reduce your child’s temperature, you should do which of the following?”; “APPmeds” for “Which of the following medicines are appropriate to give your child to lower his/her temperature?”; and “FEVimproved” for “You will know what you have done has helped your child’s fever if your:.” True or false questions included, “FEVheight” representing “It is more important how your child acts than how high the fever is.”; “harmF” for “It is harmful for a child to have a high fever.”; “brainD” for “If a fever gets too high it will cause brain damage.”; and “convulsion” for “Children are a great risk of having a convulsion if fever is high.” Lickert scale questions included “fevKNOWL” for “How much do you think you know about how to manage your child’s fever?”; “determFEV” for “How able are you to decide what to do when your child has a fever?”; and “FEVanxiety” for “Describe your current level of anxiety towards your child’s present fever by circling the appropriate picture on the 5-point Lickert face scale

provided below." Refer to the fever management questionnaire in Appendix A for further details on potential responses to each question.

Findings. Overall knowledge was not greater in the intervention group; however, two particular questions did reveal a difference between the two groups although results were only statistically significant for one of them. In asking participants to correctly identify a fever when given the following choices 100.0 °F, 101.0 °F, and 99.0 °F, 58.3% of intervention group participants correctly identified 101.0 °F as a fever as compared to 41.7% of the control group participants (see Figure 4.3). Although this finding was not significant (X^2 (1) = 1.242, $p > 0.05$), it was greater in the intervention group. A statistically significant difference in intervention participants' knowledge regarding harmful effects of fever (X^2 (1) = 5.449, $p < 0.05$) was found. When asked a true/false question regarding whether or not it is harmful for a child to have a fever, 25% of intervention subjects answered the question with false, which is correct; whereas, 0% of the control group gave a correct response. No significant findings were identified when comparing the two groups with the outcomes, self-efficacy or anxiety; however, satisfaction of the education provided was statistically significant (X^2 (1) = 5.159, p = 0.023). Sixty-five percent of participants in the intervention group described the education provided during their visit as "helpful," whereas only 40% of the control group responded positively. Seven of the total twenty intervention participants didn't complete the satisfaction survey, thus 100% of responses from the intervention group were positive. In addition, 92% of intervention subjects felt the education received increased their confidence managing their child's fever at home as compared to 75% of control subjects; however, this was not a significant finding (X^2 (1) = 1.391, $p > 0.05$).

Figure 4.1 Harmful Effects of Fever

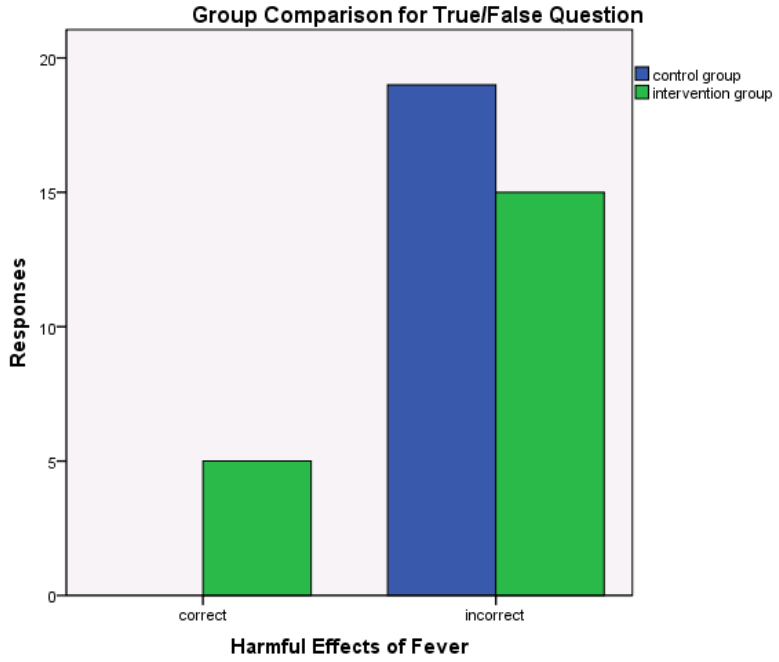


Figure 4.2 Satisfaction of Education

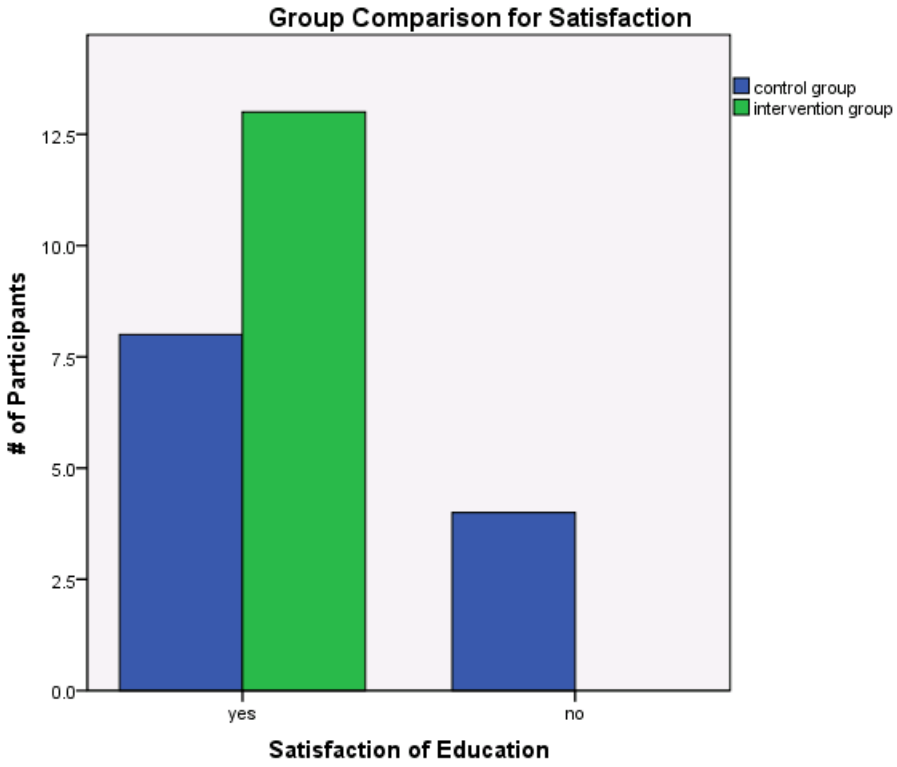


Figure 4.3 Identifying Fever Definition

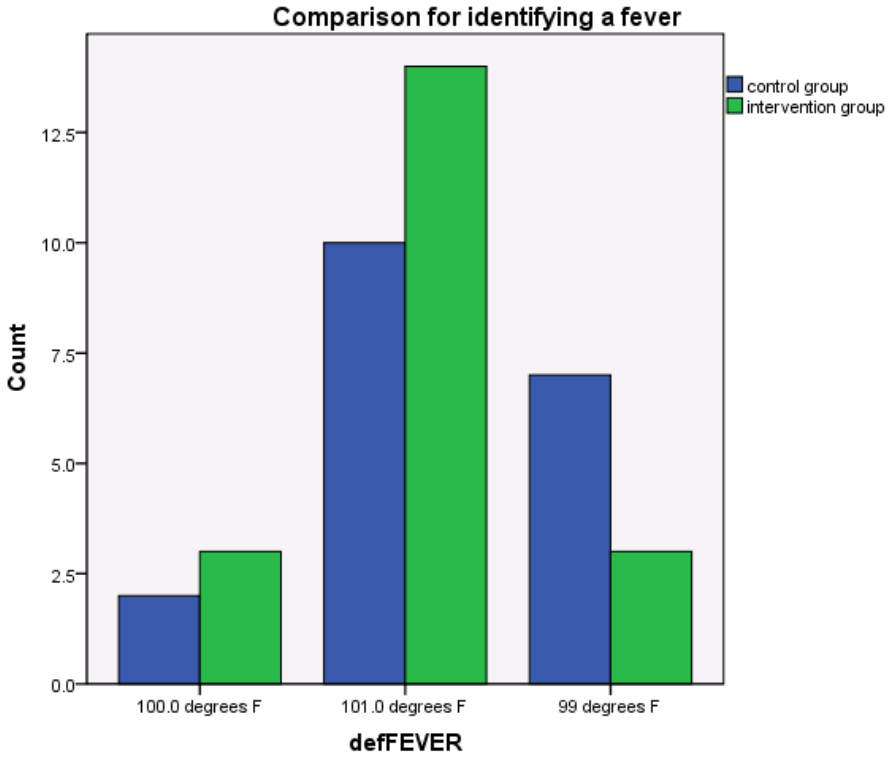


Figure 4.4 Confidence Managing Fever

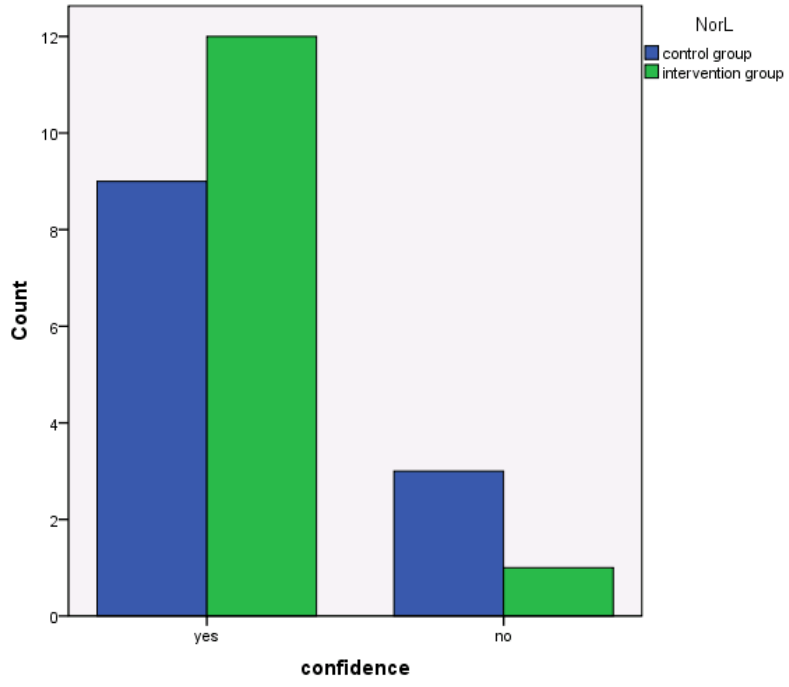


Table 4.2

Measurement Outcomes

Outcomes		X^2	df	*p*value
Knowledge				
	Oraltemp	.533	1	.465
	elevTEMP	1.111	1	.292
	FEVheight	1.949	1	.163
	MDcall	.018	1	.894
	definitionofFEVER	1.242	1	.265
	harmF	5.449	1	.020*
	brainD	.230	1	.631
	Convulsion	.000	1	1.000
	amtMED	.409	1	.522
	fCAUSES	.905	1	.342
	fevINFEC	1.138	1	.286
	callMD1	.625	1	.429
	callMD2	*No statistics computed; callMD2 is a constant		
	callMD3	2.057	1	.151
	callMD4	1.026	1	.311
	callMD5	4.444	1	.035*
	ssCall1	.125	1	.723
	ssCall2	.000	1	1.000
	ssCall3	3.243	1	.072
	ssCall4	.404	1	.525
	ssCall5	1.129	1	.288

	ssCall6	.360	1	.548
	ssCall7	1.026	1	.311
	ssCall8	1.558	1	.212
	ssCall9	.000	1	1.000
	ssCall10	.102	1	.749
	ReduceTEMP1	1.367	1	.242
	ReduceTEMP2	1.080	1	.299
	ReduceTEMP3	.174	1	.676
	ReduceTEMP4	.308	1	.579
	ReduceTEMP5	2.003	1	.157
	ReduceTEMP6	2.219	1	.136
	APPmeds1	*No statistics computed; APPmeds1 is a constant		
	APPmeds2	1.080	1	.299
	APPmeds3	.308	1	.579
	APPmeds4	.975	1	.323
	APPmeds5	.419	1	.517
	FEVimproved1	.975	1	.323
	FEVimproved2	.174	1	.676
	FEVimproved3	3.288	1	.070
	FEVimproved4	*No statistics computed; FEVimproved4 is a constant		
	FEVimproved5	*No statistics computed; FEVimproved5 is a constant		
Anxiety				
	FEVanxiety	1.656	4	.799

Satisfaction				
	Newinfo	.056	1	.813
	VPhelpful	5.159	1	.023*
	moreEDU	1.391	1	.238
Self-efficacy				
	fevKNOWL	6.294	7	.506
	determFEV	2.095	5	.836
	confidence	1.391	1	.238

*p <0.05

Secondary analyses. Several cross analyses were performed using secondary testing data. No significant findings were identified when participants' age was compared with confidence (X^2 (6) = 6.523[a], p = 0.367), knowledge regarding harmful effects of fever (X^2 (3) = 3.804[a], p = 0.283), anxiety (X^2 (12) = 7.604[a], p = 0.815), or fever visits to the ED (X^2 (6) = 5.469[a], p = 0.485). Additionally, analysis of education and race compared with the same variables described above also revealed no significant findings.

Reliability and Validity. Reliability for knowledge, self-efficacy, and satisfaction questionnaires was analyzed using Cronbach's alpha statistical test. The reliability coefficients were 0.776, 0.778, and 0.915, respectively. Spearman's rho was performed to measure reliability for the anxiety faces scale. The coefficient was a negative value (-0.089) and thus it was determined this tool was considered weak. No established criteria are available for validity testing.

CHAPTER 5

DISCUSSION

The purpose of this EBP project was to answer the PICOT question: In parents of children ages six months to five years, what is the effect of multimodal education of fever and appropriate management of childhood fever, compared to standard fever education, on knowledge, anxiety, self-efficacy, and satisfaction, as well as health services utilization regarding childhood fever, over the course of 19 weeks? Although not all findings from this project proved significant, results of the EBP project support a fever education program to further enhance parental knowledge and confidence regarding management of childhood fever as well as to increase parental satisfaction of education received. Further explication of project results, both positive and negative, will be discussed within this chapter, including strengths, weaknesses, and applicability of the Iowa Model of EBP and the Self-Efficacy Theory by Bandura.

Explanation of Findings

In order to determine the effectiveness of the multimodal fever education, four different tools were utilized to measure outcomes. Data were collected using the FMQ tool and this included measurement of three outcomes: parental confidence, anxiety, and fever knowledge. A fourth outcome, health service utilization of participants, was tabulated through tracking of ED visits per the clinical advisor; however, as discussed in chapter four, insufficient data were collected. The charting system would notify the PNP for each visit to the ED; however, this feature would only track visits from one of the three area EDs in the area. Furthermore, this data pertained to less than 10% of the subjects and was collected over a relatively short period of time as this project took place over a 19-week period. Thus, it was determined that this measurement outcome was not useful and should be eliminated. A more useful approach may have included tracking of urgent care visits, fever related after hour phone calls, and participant

reported data regarding fever ED visits via the satisfaction survey. Upon agreeing to participate in the project, a demographics form was provided to each participant in order to assess for generalizability of both the control and intervention group. This data was also collected to uncover any secondary findings that may have attributed to measured outcomes. Satisfaction surveys were provided to participants from each group at the end of the office visit. As a small incentive for offering their time and attention, willing participants were offered a Walmart five-dollar gift card for their participation. It is assumed that those who met criteria and were asked to take part in the study were more willing to participate as they received a small "perk" for their participation. Despite 100% of participants completing both the demographics form and the FMQ, the satisfaction survey attrition rate was 37.5% (control group n = 20 and subjects who completed satisfaction survey n = 12; intervention group n =20 and subjects who completed satisfaction survey n = 13). Only 7.5% of the total subjects returned the satisfaction surveys via mail and 55% of the remaining 93% of subjects were successfully contacted via phone in order to obtain satisfaction data. Thirty-eight percent of subjects could not be contacted due to disconnected phone service, as contact numbers were not regularly updated in the system at the clinical site. Thus, only 63% of subjects were able to provide feedback on their confidence and satisfaction of the education received. The project manager was only present on intervention days, thus MAs and the clinical advisor were to carry out the project on control days. It is a very busy practice; therefore, MAs may not have adequately explained the procedure for completing the satisfaction surveys and mailing them back within two weeks.

Following the collection of data over a period of 19-weeks, analysis was completed using IBM SPSS Statistics software, version 18. As determined through calculation of Cronbach's alpha statistical test, reliability for knowledge, self-efficacy, and satisfaction questionnaires proved reliable with internal consistency scores of 0.776,

0.778, and 0.915, respectively. Using Spearman's rho, the anxiety faces scale resulted in a score of -0.089 and thus was considered to be a weak tool. Insufficient data were collected regarding health service utilization in the ED, thus this outcome data were not analyzed. The educational materials used for the intervention consisted of a cost effective and readily available three minute video on childhood fever and appropriate management from the AAP, and an educational pamphlet from the AAP entitled, "Fever and Your Child" which cost the project manager approximately 30 dollars.

Demographics. As predicted, there were significantly more females than males who participated in the EBP project. This trend was likely due to the fact that a vast majority of caregivers are mothers/females and may also be related to the fact that many of the subjects who participated in this project selected single as their marital status (60% of control group and 45% of intervention group). There were no major differences between the two groups besides one significant finding regarding ED fever visits. The finding identified included participants who claimed to utilize the ED for fever (X^2 (2) = 7.436, p = <0.05). Seventy percent of the control group stated they had not utilized the ED for fever visits, as compared to 15%, once and 15%, 2-3 times, whereas 50% of the intervention group claimed not to have utilized the ED for fever visits, as compared to 50%, 2-3 times. It is likely that this finding may have impacted outcomes such as anxiety of control versus intervention group, as this result reveals that the control group may not consider a febrile child to be a medical emergency as opposed to the intervention group who might be viewed as more anxious parents, overall. Furthermore, overall results of anxiety were similar for both groups following the education received. Perhaps assessment of anxiety for both groups before and after receiving fever education would have been a better method to evaluate whether or not the intervention was more effective at decreasing parental anxiety as compared to standard education. It is assumed that control group participants may have been less anxious about their

febrile children as evidenced by significantly fewer visits to the ED within the past six months of implementation. The multimodal fever education received by the intervention group may have decreased anxiety related to their child's fever making their level of anxiety closer to that of the control group.

Applicability of the Theoretical Framework

Self-Efficacy Theory. This study utilized Bandura's self-efficacy theory to guide the research project. Bandura (1977) first introduced the theory of self-efficacy, which was derived from the social cognitive theory. As a reminder, the major foundation of this theory is that a person's behavior is affected by their thoughts, beliefs, and feelings (Peterson & Bredow, 2009). Bandura (1977) suggested that an individual's expectations of personal efficacy are based on four sources of information: performance accomplishments, vicarious experience, verbal persuasion, and physiological states. Personal mastery of the individual as it relates to the information source, performance accomplishments, is likely to vary widely among parents as people process, weigh, and determine their abilities based on personal experiences unique to them. Thus, due to the variance in each individual's development of efficacy expectations, it is difficult to assume that the new source of information will affect every individual uniformly (Bandura, 1977). The same rationale can be applied to vicarious experiences for participants and persuasive suggestion, as expectations were unique to each individual depending on previous experiences that may have overwhelmed them in the past. The fourth and final information source involves the individual relying on cues from his or her degree of emotional arousal or physiological feedback in order to judge his or her abilities (Bandura, 1977; Peterson et al., 2009). However, these specific outcomes were not evaluated for this EBP project.

Given that HCPs have the opportunity to make a positive impact on parental self-efficacy, this EBP project found that implementation of a fever management program

using credible educational interventions has potential to increase parental knowledge and confidence in managing fever. Furthermore, the self-efficacy theory can potentially improve the HCP's understanding of why parents might practice particular behaviors related to fever in their children and help them find ways to change negative behaviors. At the completion of the project, it was determined that the self-efficacy theory was a good fit for this EBP project.

Applicability of the EBP Framework

Iowa Model of Evidence-Based Practice. The Iowa Model of EBP was utilized for this multimodal fever education project. A key strength of the model is that allows the clinician to focus on both knowledge and problem-focused triggers, and leads staff to question current practices and whether up-to-date evidence can improve patient care. Upon meeting with the office staff, everyone was receptive to assisting with the implementation process and appreciated the idea of educating parents on appropriate fever management. After sharing the literature and overall vision for the parental fever education program with both the MAs, it was refreshing to observe the excitement for their role in this project. They agreed that the practice was in need of parental education related to this topic as many parents had questions and appeared to lack knowledge on this topic. Furthermore, this model was an appropriate fit for this EBP project as the applicability of the framework assisted in guiding necessary adaptations throughout the course of the project.

As previously discussed in Chapter 2, the Iowa Model consists of seven steps including (1) selection of a topic, (2) forming a team, (3) evidence retrieval, (4) grading the evidence, (5) developing an EBP standard, (6) implementation of EBP, and (7) evaluation. In addition, the flow of the algorithm depends on three key decision points (a) Is the topic a priority for the organization?, (b) Is there sufficient research base?, and (c) Is change appropriate for adoption in practice? These decision-making points allow

the researcher to frequently evaluate progression of the EBP process ensuring that it continues moving forward in the appropriate direction. Each step of the Iowa Model seemed to go rather smoothly despite a couple setbacks. In retrieval of evidence and development of an EBP standard, the project manager attempted to contact several authors who did not respond via email in a timely manner. One author stated that her study was old and thus, she would not be of much assistance. It took a few attempts to contact that particular author before she was willing to grant permission to utilize an existing tool measuring anxiety, however, she was not able to retrieve any findings for the reliability of the test. At this point in time, the project manager was feeling a bit nervous about obtaining tools which measure knowledge and self-efficacy of fever management. Another author and pediatrician from Southeast Texas who was passionate about the topic of childhood fever and had previously published a study on the impact of education on health service utilization responded stating his interest in having a conference call to discuss the project. His work with fever research spans over the past two decades, and he explained that one of his studies on fever education reduced ER visits for fevers by more than 30%. He also mentioned that all parents in his practice have come to know and understand the mantra, “fever is your friend.”

In applying the Iowa Model to this EBP project, the first step consisted of the project manager identifying a problem-focused trigger, effects of knowledge deficit regarding fever on perceived self-efficacy of management of febrile illness and clinician observation of unrealistic fears in parents of febrile children in the office setting as well as in the emergency department. Next, a team was formed after discussing the topic with office staff at the clinical agency where the project was implemented. Team members consisted of a clinical advisor, three MAs, a registered nurse who also performed duties as office manager, and the DNP student who served as project manager. The third step, retrieval of evidence, was performed using a thorough

literature search within multiple databases. In addition to evidence found in the literature, the clinical advisor also identified problems within the clinical agency related to parental knowledge deficit regarding fever, which further supported the need for the EBP fever education program. One problem cited by the clinical agency included the fact that a majority of clients seen within this clinical setting came from lower socioeconomic backgrounds and tended to have lower education levels. Therefore, reinforcement of education related to the topic of fever was essential for this patient population. Inclusion and exclusion criteria assisted in narrowing the literature to include relevant evidence in this project.

The fourth step of the Iowa Model involves grading of evidence using appropriate appraisal tools. The non-research and research evidence appraisal tools developed by John Hopkins University School of Nursing were chosen for their simplicity, efficiency, and ease of use (JHNEBP, 2005) and levels of evidence were determined using the Melnyk and Fineout-Overholt (2011) hierarchy of evidence pyramid as a guide. Step five includes development of an EBP standard, where literature suggests that the most effective method of educating parents on fever is a formal education strategy involving mixed methods of written, visual, and interactive material in a structured or repeated session (Young et al., 2010; Sanghavi, 2005; Baker et al., 2009). The sixth step involves implementation of the EBP project in the selected pediatric practice. This step required extensive planning, as implementation is a crucial step of the EBP project. For example, a thorough review of previous studies was performed in order to obtain a greater understanding of the best ways to carry out the implementation phase. Additionally, a conference call with a pediatrician who had successfully carried out a fever education project previously provided insight and suggestions on the plan and procedure for this EBP project.

Finally, the seventh step consists of evaluating results of the EPB project. This includes determining effectiveness of the piloted change by comparing measurement outcomes from the intervention group to the control group. Measured project outcomes included parental knowledge, self-efficacy, anxiety, satisfaction, and health service utilization. Regardless of whether a project's findings are positive or negative, an important part of this step is the act of disseminating results. This action is what improves the quality of care within the discipline of advanced practice nursing and continues to drive it forward.

Strengths of the EBP Project

There were several strengths identified throughout the course of this EBP project. The project manager felt very passionate about the potential of this project and had very high hopes going into the implementation phase. During the initial search for additional evidence, the project manager kept in mind the overall goal for developing a practice change. Feasibility of educational methods was considered as the selected clinical agency, like many other pediatric offices tended to be extremely busy at times. The PNP believed there was a true need for education in her office; however, she cited a lack of time as one major barrier for the development of an educational program. This added support further motivated the project manager to succeed.

Although there were moments that the project implementation felt stalled or slow moving, the pace would eventually gather momentum and continue moving in the right direction after a few minor adaptations. Successful aspects of implementation were attributed to effective planning throughout each step of the Iowa Model. One positive aspect about the implementation phase was that the project manager discovered that the planning process had been very well organized. Most everything had been considered, from the need for Wi-Fi to the use of a handy suction cup device for the iPad mini making it hands free and out of reach for children. Cluing in on limitations observed

in previous studies had a great deal of utility for the planning phase of the project. Through remaining in close contact with the faculty advisor and heeding advice, the project manager realized this insight was extremely helpful. For instance, the faculty advisor recommended extending the implementation timeframe for data collection by a few weeks to account for any extenuating circumstances that could potentially prolong data collection. Additional strengths include the ability to extract valuable data during the implementation phase of this project as four valuable outcome measurements were collected and analyzed throughout this EBP project. These outcome measurements included parental anxiety, self-efficacy, knowledge, and satisfaction. In addition, this intervention was very practical as parents appreciated the education and were able to view the video while waiting for the PCP to examine their child. Furthermore, this educational program can be easily rolled out within the agency and continued after the project's completion. Overall, parents in the intervention group appreciated the education provided and stated they wished to have additional education provided to them during office visits.

Weakness of the EBP Project

Despite successes that were celebrated throughout the various phases of the EBP project, a few weaknesses were also noted. Very few subjects were recruited early on in the implementation phase of the project, despite a high volume of patients (approximately 40-50) being seen each day. It was realized that despite the project manager's confidence in the project, it was difficult to predict how well things would work out prior to implementation. It was decided then that the implementation phase and recruitment of subjects was going to be much more difficult and cumbersome than originally thought. The original goal was to collect a total of 100 subjects. However, within the first few weeks of the implementation phase, the project manager began to realize it would take a great deal of additional time to recruit 100 subjects, and it was

decided that the original goal was unrealistic. Additional control and intervention days were added to the schedule as the recruitment of subjects were “hit and miss.” It was finally decided that it would be a good idea to have the materials available to run controls on every possible day, Monday-Wednesday-Friday, until an equal amount of subjects were collected for each group. Although the initial progress was discouraging, it was not too late to turn things around and it prompted the project manager to make a few necessary adaptations. Thus, additional intervention days were added and the clinical agency staff implemented control days for multiple consecutive days until control group numbers caught up to the intervention group numbers. Furthermore, the original goal of 50 intervention subjects and 50 control subjects needed to be adapted to 20 for the intervention group and 20 for the control group. A greater number of subjects might have bolstered the results; however, seasonal influences likely played a part in subject recruitment, as numbers were lower during the months of September and October (recruitment of 21 subjects) and dramatically increased during the three weeks of collection in November and December (recruitment of 19 subjects). The increased number of fever complaints during November and December may have been attributed to the height of flu season and numerous other respiratory illnesses, which typically increase during the winter months. The project outcomes did not reveal a significant change in a number of outcomes such as ED visits for fever and improvement of anxiety. In addition, no secondary findings were identified. Only one FMQ question measuring knowledge supported a significant improvement in knowledge for the intervention group.

Implications for the Future

Practice and Education. Based upon the positive outcomes of this EBP project, it is recommended that a multimodal fever education program be implemented at this clinical agency using teaching strategies such as verbal, written, and video. Results of this project reveal that there is potential to improve parental satisfaction of education,

parental confidence in managing fever, and changing parental perspectives on the misconceptions such as viewing childhood fever as harmful. Parents in the intervention group were also more likely to accurately identify the definition of fever although this finding was not significant (X^2 (1) = 1.242, $p > 0.05$). It is anticipated that persistent education with subsequent visits has the potential to make a positive impact not only on parental knowledge, but also on confidence in managing fever. Future studies involving a longer implementation period may benefit from tracking office visits and phone calls for fever related complaints/concerns. This could increase the understanding on whether or not a fever education program impacts utilization of services. Furthermore, randomization of subjects as well as a larger sample size might have improved generalizability of participants, thereby, improving the study.

Knowledge is power, and education has the potential to impact behavioral changes among patients. Providing additional education proved to increase parental satisfaction and is a cost-effective change that has the potential to improve knowledge and parental self-efficacy. Furthermore, advanced practice nurses pride themselves on their ability to impact change in patients through education and health promotion and there are always opportunities to teach. However, one common barrier to this is the lack of time in busy practices, much like the site where this EBP project took place. A fever education program can ensure that patients are getting the education they need. Research has shown there is a need for consistent and accurate fever education and this program, which includes educational materials from a credible source, has the potential to make a positive difference.

Theory. With the use of the self-efficacy theory, efforts were made to accurately evaluate the need for change and deciding the best approach towards achieving desired outcomes. Although one assessment found that parental self-efficacy showed significant improvement in the intervention group, another item on the FMQ which

consisted of a 10-point Lickert scale and sought to measure parental confidence, failed to show a significant difference between the two groups. Perhaps future studies should consider educating parents on multiple occasions prior to assessing if the educational intervention effected a change on participants, as it is often believed that repeated sessions are more likely to positively impact the desired behavioral change (Young et al., 2010).

Research. The comprehensive review of literature obtained early on in the development phase of this project assured the project manager that the project was moving in the right direction. Although each study within the literature review consisted of various forms of educational materials including written and videos, finding materials from a reputable source was imperative to the project manager as Walsh & Edwards (2006) cited that fever education should be based on current scientific evidence from a credible source. Furthermore, authors emphasize the need for HCPs to equip caregivers with accurate evidence-based education as a means to combat the negative impact fever phobia has on our health care system. As noted previously, a larger sample size and a longer implementation period has the potential to further identify the best methods to impact outcomes such as knowledge, self-efficacy, anxiety, health service utilization, and satisfaction.

REFERENCES

Bandura, A. (1994). *Self efficacy.* In Encyclopedia of Human Behavior. New York, NY: Academic Press.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191-215. doi:10.1037/0033-295X.84.2.191

Bandura, A., Adams, N. E., & Beyer, J. (1977). Cognitive processes mediating behavioral change. *Journal Of Personality And Social Psychology*, *35*(3), 125-139. doi:10.1037/0022-3514.35.3.125

Baker, M., Monroe, K., King, W., Sorrentino, A., & Glaeser, P. (2009). Effectiveness of fever education in a pediatric emergency department. *Pediatric Emergency Care*, *25*(9), 565-568. doi:10.1097/PEC.0b013e3181b4f64e

Bloch, S., & Bloch, A. (2013). Using video discharge instructions as an adjunct to standard written instructions improved caregivers' understanding of their child's emergency department visit, plan, and follow-up: A randomized controlled trial. *Pediatric Emergency Care*, *29*(6), 699-704. doi:10.1097/PEC.0b013e3182955480

Bloomfield, L., Kendall, S., Applin, L., Attarzadeh, V., Dearnley, K., Edwards, L., & ... Newcombe, T. (2005). A qualitative study exploring the experiences and views of mothers, health visitors and family support centre workers on the challenges and difficulties of parenting. *Health & Social Care In The Community*, *13*(1), 46-55. Retrieved from http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-2524

Broome, M., Dokken, D., Broome, C., Woodring, B., & Stegelman, M. (2003). A study of parent/grandparent education for managing a febrile illness using the CALM approach. *Journal Of Pediatric Healthcare*, *17*(4), 176-183. Retrieved from http://www.jpedhc.org

CASP, 2003. Critical Appraisal Skills Programme (CASP): appraisal tools. Public Health Resource Unit, NHS.

Chang, M., Chen, Y., Chang, S., & Smith, G. (2012). Knowledge of using acetaminophen syrup and comprehension of written medication instruction among caregivers with febrile children. *Journal Of Clinical Nursing*, *21*(1/2), 42-51. doi:10.1111/j.1365-2702.2010.03668.x

Crocetti, M., Moghbeli, N., & Serwint, J. (2001). Fever phobia revisited: have parental misconceptions about fever changed in 20 years?. *Pediatrics*, *107*(6), 1241-1246. Retrieved from http://pediatrics.aappublications.org

Crocetti, M., & Serwint, J. (2005). Fever: separating fact from fiction. *Contemporary Pediatrics*, *22*(1), 34-42. Retrieved from http://contemporarypediatrics.modernmedicine.com

de Montigny, F., & Lacharité, C. (2005). Perceived parental efficacy: concept analysis. *Journal Of Advanced Nursing*, *49*(4), 387-396. doi:10.1111/j.1365-2648.2004.03302.x

Doody, C. M., & Doody, O. (2011). Introducing evidence into nursing practice: using the IOWA model. *British Journal Of Nursing*, *20*(11), 661-664. Retrieved from http://info.britishjournalofnursing.com

Fieldston, E., Nadel, F., Alpern, E., Fiks, A., Shea, J., & Alessandrini, E. (2013). Effects of an education and training intervention on caregiver knowledge of nonurgent pediatric complaints and on child health services utilization. *Pediatric Emergency Care*, *29*(3), 331-336. doi:10.1097/PEC.0b013e31828512c7

Glanz, K., Lewis, F. M., & Rimer, B. K. (1990). *Health behavior and health education: Theory, research, and practice.* San Francisco: Jossey-Bass Publishers.

Herman, A., Young, K., Espitia, D., Fu, N., & Farshidi, A. (2009). Impact of a health literacy intervention on pediatric emergency department use. *Pediatric Emergency Care*, *25*(7), 434-438. doi:10.1097/PEC.0b013e3181ab78c7

Newhouse, R., Dearholt, S., Poe, S., Pugh, L. C., White, K. (2005). The Johns Hopkins Nursing Evidence-Based Practice Rating Scale. Baltimore, MD, The Johns Hopkins Hospital; Johns Hopkins University School of Nursing.

Kramer, M. S., Naimark, L., & Leduc, D. G. (1985). Parental Fever Phobia and Its Correlates. *Pediatrics*, *75*(6), 1110. Retrieved from http://pediatrics.aappublications.org

Li-Chuan, C., Ching-Chuan, L., & Mei-Chih, H. (2013). Parental Knowledge, Concerns, and Management of Childhood Fever in Taiwan. *Journal Of Nursing Research (Lippincott Williams & Wilkins)*, *21*(4), 252-260. doi:10.1097/jnr.0000000000000007

McDonald, C., Haberman, D., & Brown, N. (2013). Self-efficacy: empowering parents of children with cystic fibrosis. *Journal Of Cystic Fibrosis: Official Journal Of The European Cystic Fibrosis Society*, *12*(5), 538-543. doi:10.1016/j.jcf.2012.11.014

Melnyk, B. M. & Fineout-Overholt, E. (2011). *Evidence-based practice.* Philadelphia, PA: Lippincott Williams & Wilkins.

O'Neill-Murphy, K., Liebman, M., & Barnsteiner, J. (2001). Fever education: does it reduce parent fever anxiety?. *Pediatric Emergency Care*, *17*(1), 47-51. Retrieved from http://journals.lww.com/pec-online/pages/default.aspx

Peterson, S. J., & Bredow, T. S. (2009). *Middle range theories: Application to nursing research*. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.

Poirier, M., Collins, E., & McGuire, E. (2010). Fever phobia: a survey of caregivers of children seen in a pediatric emergency department. *Clinical Pediatrics*, *49*(6), 530-534. doi:10.1177/0009922809355312

Purssell, E. (2010). Ibuprofen for treatment of fever in infants. *Practice Nursing*, *21*(10), 533-537. Retrieved from http://www.practicenursing.com

Purssell, E., & While, A. (2011). Development of a scale to measure parental self-efficacy in the care of pre-school children during periods of health and minor illness: integrating health and social policy methods. *Journal Of Clinical Nursing*, *20*(11/12), 1623-1631. doi:10.1111/j.1365-2702.2010.03591.x

Robinson, J. S., Schwartz, M. L., Magwene, K. S., Krengel, S. A., & Tamburello, D. (1989). The impact of fever health education on clinic utilization. *American Journal Of Diseases Of Children (1960)*, *143*(6), 698-704. Retrieved from http://archpedi.jamanetwork.com

Rycroft-Malone, J., & Bucknall, T. (2010). *Models and frameworks for implementing evidence-based practice: Linking evidence to action.* Chichester, West Sussex: Wiley-Blackwell.

Samuels-Kalow, M., Stack, A., & Porter, S. (2013). Parental language and dosing errors after discharge from the pediatric emergency department. *Pediatric Emergency Care*, *29*(9), 982-987. doi:10.1097/PEC.0b013e3182a269ec

Sanghavi, D. (2005). Taking well-child care into the 21st century: a novel, effective method for improving parent knowledge using computerized tutorials. *Archives Of Pediatrics & Adolescent Medicine*, *159*(5), 482-485. Retrieved from http://archpedi.jamanetwork.com/journal.aspx

Sarrell, M., & Kahan, E. (2003). Impact of a single-session education program on parental knowledge of and approach to childhood fever. *Patient Education & Counseling*, *51*(1), 59-63. Retrieved from http://www.pec-journal.com

Schmitt, B. (1980). Fever phobia: misconceptions of parents about fevers. *American Journal Of Diseases Of Children (1960)*, *134*(2), 176-181. Retrieved from http://archpedi.jamanetwork.com/journal.aspx

Schmidt, N. A. & Brown, J. M. (2012). *Evidence-based practice for nurses: Appraisal and application of research.* Sudbury, MA: Jones & Bartlett Learning, LLC.

Shumaker, S. A. (1998). *The handbook of health behavior change.* New York: Springer Publishing Company.

Taylor-Piliae, R. (1999). Utilization of the Iowa Model in establishing evidence-based nursing practice. *Intensive & Critical Care Nursing*, *15*(6), 357-362. Retrieved from http://www.journals.elsevier.com/intensive-and-critical-care-nursing

Titler, M. G., Kleiber, C., Steelman, V., Rakel, B., Budreau, G., Everett, L. Q., Buckwalter, K. C., Tripp-Reimer, T., & Goode, C. (2001). The Iowa Model of Evidence-Based Practice to Promote Quality Care. *Critical Care Nursing Clinics of North America, 13*(4), 497-509. Retrieved from http://www.ccnursing.theclinics.com

van den Anker, J. N. (2013). Optimising the management of fever and pain in children. *International Journal Of Clinical Practice (Supplement)*, *67*26-32. doi:10.1111/ijcp.12056

Wallenstein, M. B., Schroeder, A. R., Hole, M. K., Ryan, C., Fijalkowski, N., Alvarez, E., & Carmichael, S. L. (2013). Fever Literacy and Fever Phobia. *Clinical Pediatrics*, *52*(3), 254-259. doi:10.1177/0009922812472252

Walsh, A., & Edwards, H. (2006). Management of childhood fever by parents: literature review. *Journal Of Advanced Nursing*, *54*(2), 217-227. doi:10.1111/j.1365-2648.2006.03802.x

Whittaker, K., & Cowley, S. (2012). A survey of parental self-efficacy experiences: maximising potential through health visiting and universal parenting support. *Journal Of Clinical Nursing*, *21*(21/22), 3276-3286. doi:10.1111/j.1365-2702.2012.04074.x

Yin, H., Dreyer, B., van Schaick, L., Foltin, G., Dinglas, C., & Mendelsohn, A. (2008). Randomized controlled trial of a pictogram-based intervention to reduce liquid medication dosing errors and improve adherence among caregivers of young children. *Archives Of Pediatrics & Adolescent Medicine*, *162*(9), 814-822. Retrieved from http://archpedi.jamanetwork.com/journal.aspx

Young, M., Watts, R., & Wilson, S. (2010). The effectiveness of educational strategies in improving parental/caregiver management of fever in their child: A systematic review. *The JBI Library of Systematic Reviews, 8*(21), 826-868.

Zomorrodi, A. & Attia, M. W. (2008). Fever: Parental concerns. *Clinical Pediatric Emergency Medicine, (9),* 238-243. doi:10.1016/j.cpem.2008.09.007

BIOGRAPHICAL MATERIAL

Teresa S. Parkhouse

Ms. Parkhouse first began her career at the Leighton Heart & Vascular Center at Memorial Hospital of South Bend upon completion of her BSN from Purdue University, West Lafayette in 2006. Teresa continued her career as a travel nurse in 2009, while working on a medical/surgical telemetry unit and a renal/metabolic unit in the Chicago and Indianapolis areas. She later began working on a progressive care unit before transitioning to the MICU at Saint Joseph Regional Medical Center (SJRMC) in Mishawaka, Indiana. More recently, Ms. Parkhouse has gained an invaluable experience working in the emergency department (ED) at Porter Regional Hospital in Valparaiso, Indiana. She first realized her interest and passion for parental fever education through numerous interactions with parents in the ED and during her clinical experiences at Lincoln Pediatrics in Michigan City, Indiana. Teresa's EBP abstract was selected for a poster presentation at the Midwest Nursing Research Society (MNRS) conference held in Indianapolis and the 22nd National EBP Conference in Iowa City, Iowa both held in April 2015. Ms. Parkhouse is an active member of Sigma Theta Tau International Delta Omicron Chapter, the American Association of Nurse Practitioners, and the Coalition for Advanced Practice Nurses of Indiana. Upon completion of her DNP degree and becoming board certified in family practice in May 2015, Teresa plans to continue her career in the family practice setting.

ACRONYM LIST

AAP: American Academy of Pediatrics

APA: American Psychological Association

ASA: Aspirin

CASP: Critical Appraisal Skills Programme

CINHAL: Cumulative Index of Nursing and Allied Health Literature

DNP: Doctorate in Nursing Practice

ED: Emergency Department

EBP: Evidence-Based Practice

ERIC: Education Resources Information Center

FMQ: Fever management questionnaire

HCP: Health care provider

IRB: Institutional review board

JBI: Joanna Briggs Institute

JHNEBP: Johns Hopkins Nursing Evidence-Based Practice

NGC: National Guideline Clearinghouse

NP: Nurse practitioner

MA: Medical assistant

PICOT: Patient population, intervention of interest, comparison of interest, outcome of interest, time

PCP: Primary care physician

PNP: Pediatric nurse practitioner

RCT: Randomized control trial

Appendix A

Participant ID: ___ ___

Fever Management Questionnaire

Instructions: The following questions ask you to tell us what you understand about taking care of your child when he/she has a fever. Please read over and answer the following questions. Note that some questions have only one right answer, while others have many right or wrong answers. For several of the questions you will be asked to check "Yes" or "No". For others you will be asked to choose only one answer. If you don't want to answer any particular question, you don't have to. Go on to the next one. Thank you for helping us to better know what parents understand about fever.

1. How old should a child be when you take a temperature in the mouth? (choose the **one** best answer):
   ☐ 12 months or older
   ☐ 2 years or older
   ☐ 3 years or older
   ☐ 6 years or older

2. Which *one* of the following temperatures is **above** normal no matter where you take it?
   ☐ 96.0º F
   ☐ 98.0º F
   ☐ 101.0º F

3. When do you need to call your child's doctor or nurse? (choose **all** that are right):
   ☐ child is 3 months or younger and has a fever.
   ☐ child has temperature of 98.6º F.
   ☐ child has temperature of 105º F or higher.
   ☐ child acts confused.
   ☐ child has fever for more than 72 hours.

4. Imagine your child has a fever. Which of the following signs or symptoms means you should call your child's doctor right away? (choose **all** that are right):
   ☐ child has ear pain
   ☐ child is active and playing
   ☐ child appears very sick
   ☐ child is eating a little less than usual.
   ☐ child has a stiff neck
   ☐ child is hungry
   ☐ child is easy to wake up
   ☐ child cries and can't be comforted
   ☐ child has trouble breathing
   ☐ child has a runny nose

5. To reduce your child's temperature, you should do which of the following? (choose **all** that are right):
   ☐ turn down the room temperature to 65º-70º F.
   ☐ dress child in light clothing
   ☐ apply cool, wet cloths to child's forehead
   ☐ put child in a very cold bath
   ☐ don't give him/her anything to drink
   ☐ keep child quiet

6. Which of the following medicines are appropriate to give your child to lower his/her temperature? (choose **all** that are right):
   ☐ decongestant (Sudafed)
   ☐ Acetaminophen (Children's Tylenol)
   ☐ Aspirin (St. Joseph's)
   ☐ Ibuprofen (Children's Motrin)
   ☐ antihistamine (Benadryl)

7. It is more important how your child acts than how high the fever is.
   ☐ Yes ☐ No

8. You will know what you have done has helped your child's fever if your: (choose **all** that are correct)
   ☐ child's fever has come down
   ☐ child looks and acts better
   ☐ child is sleeping comfortably
   ☐ child is eating and drinking
   ☐ child is unable to play
   ☐ child's fever is two degrees higher than before you gave the medication

9. The doctor should be called when a child has a fever and (circle the **one** best answer):
   A. the child is very sleepy and hard to wake up.
   B. the fever is lasting for more than 1 hour after giving the right dose of Tylenol.
   C. the child is happy, but the fever came back 6 hours after the first dose of Tylenol.

10. In a child **older than 3 months of age**, which of the following is considered a fever (circle the **one** best answer):
    A. 100.0ºF
    B. 101.0ºF
    C. 99.0ºF

11. It is harmful for a child to have a high fever. true false

12. If fever gets too high it will cause brain damage. true false

13. Children are at great risk of having a convulsion if fever is high. true false

14. How much does your child weigh? _____ pounds.

15. How old is he or she? _____ years _____ months.

12. Look at the chart: How much fever medicine would you give your child if she/he had a fever? _____

Directions: Dosage may be repeated every 4 hours as needed or as directed by a doctor. Do not give more than 5 doses in 24 hours.

Children under 2 years (under 24 lbs)	**Ask a doctor**
Children 2-3 years (24-35 lbs)	1 teaspoonful (5 mL)
Children 4-5 years (36-47 lbs)	1 ½ teaspoonfuls (7.5 mL)
Children 6-8 years (48-59 lbs)	2 teaspoonfuls (10 mL)
Children 8-10 years (60-71 lbs)	2 ½ teaspoonfuls (12.5 mL)
Children 11 years (72-95 lbs)	3 teaspoonfuls (15 mL)

Other information: store at room temperature

Teaspoon= (tsp) Tablespoon= (Tbl) Milliliter= (mL)

13. Fever often causes (circle the **one** best answer):
    A. brain damage or mental retardation
    B. worse infections of the body
    C. better ability to fight off infections

14. Which of the following about fevers and infections is true? (circle the **one** best answer):
    A. antibiotics will cure virus infections.
    B. most fevers in children last 2 or 3 days.
    C. most children younger than 3 years get about 1 fever every year.

15. On a scale of 1 to 10, with 1 being *not knowing very much* and 10 being *knowing a lot*, how much do you think you know about how to manage your child's fever? (Circle the number that is closest to the way you feel):

1---------2---------3---------4---------5---------6---------7---------8---------9---------10
not very much know some know all

16. On a scale of 1 to 10, with 1 being *not at all able* and 10 being *very able*, how able are you to decide what to do when your child has a fever? (Circle the number that is closest to the way you feel):

1---------2---------3---------4---------5---------6---------7---------8---------9---------10
not at all able somewhat able very able

17. Describe your current level of anxiety towards your child's present fever by circling the appropriate picture on the 5-point Lickert face scale provided below.

1 2 3 4 5

None Moderate Severe

Thank you!

Appendix B

Participant ID: ____ ____

Demographics Questionnaire

Instructions: Please take a moment to complete the following questions. If you have any questions please ask. Thank you.

1. Your relationship to this child:
   ☐ mother ☐ father ☐ other, please describe: _____
2. Your age: _____ years Your gender: ☐ male ☐ female
3. Your Marital Status:
   ☐ single
   ☐ married
   ☐ separated
   ☐ divorced
   ☐ widowed
   ☐ other, describe:_____
4. Is English your first language? ☐ yes ☐ no
5. Do you consider yourself fluent in the English language? ☐ yes ☐ no
6. What is your race?
   ☐ Caucasian
   ☐ Hispanic
   ☐ African American
   ☐ Asian American
   ☐ other, describe:_____
7. The *highest* level of education you have completed:
   ☐ 8th grade level
   ☐ 9th-12th grade
   ☐ high school diploma or GED
   ☐ some college
   ☐ associates degree
   ☐ bachelor's degree
   ☐ masters degree or higher
8. Your *current* employment status:
   ☐ employed for wages
   ☐ self-employed
   ☐ government employee
   ☐ employee of a private company
   ☐ retired
   ☐ unemployed

9. Approximate annual household income: _____

10. Your child's gender: ☐ male ☐ female

11. This child is the: ☐ first child ☐ second child ☐ third child ☐ other

12. Your child's age: _____ years _____ months

13. How many *total* children live in the home? _____ What are their ages? _____

14. What is your primary source of medical advice when your child develops a fever?
    ☐ pediatrician or primary care physician
    ☐ emergency department
    ☐ internet
    ☐ urgent care
    ☐ relative or friend
    ☐ other, please describe _____

15. To your knowledge, have any of your children ever had seizures?
    ☐ No
    ☐ I have a child/children who experienced febrile seizures.
    ☐ I have a child/children who experienced seizures without fever.
    ☐ I cannot remember

16. How do you dose antipyretics (Acetaminophen/Tylenol or Ibuprofen/Motrin) for your child when treating them for a fever?
    ☐ based on his/her weight using a scale in the home
    ☐ based on his/her current age
    ☐ based on his/her most recent weight at the doctor's office
    ☐ other (please, describe): _____.

17. Have you ever been told by a physician that your child has a serious health problem or is your child undergoing treatment for a medical diagnosis?
    ☐ No ☐ Yes (if yes, please describe below):

    _____

18. Does your child currently take any medications?
    ☐ No ☐ Yes (if yes, please list them below):

    _____

19. In the past year, how many times have you taken your child to the emergency department for problems other than fever?
    ☐ none
    ☐ 2-3 times
    ☐ 3-4 times
    ☐ 5 times or more

20. In the past year, how many times have you taken your child to the emergency department for fever?
    ☐ none
    ☐ 2-3 times
    ☐ 3-4 times
    ☐ 5 times or more

21. In the past year, how many times have you taken your child to a family doctor or pediatrician for fever?
    ☐ none
    ☐ 2-3 times
    ☐ 3-4 times
    ☐ 5 times or more

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS FORM!

Appendix C

September 8th, 2014

Lincoln Pediatrics Staff,

The time has come to implement my evidence-based practice fever education project. As you all know, childhood fever is a common concern for parents and although fever does not always necessitate immediate medical attention, a lack of knowledge and understanding regarding fever and its appropriate management can lead to problems, such as increased parental anxiety related to fever as well as unnecessary visits to the emergency department. Over the summer, I have been working on collecting evidence on the topic of parental fever education and the most effective methods to improve knowledge, confidence, anxiety, health service utilization (ED visits), as well as satisfaction of education related to fever. The literature shows that multimodal education, which includes a combination of written, verbal, and video educational methods are most effective in educating parents on fever.

With that being said, I have come up with a procedure plan for my project, which will take place over a period of 19 weeks. The project will begin on Monday, September 15th and will continue until enough subjects are recruited through January 12th, 2015. Subjects will be divided into two groups: the intervention group and control group and each group will be recruited based on their child's chief complaint on separate days. Tentative dates for the intervention group include September 15th, September 22nd, October 13th, and October 22nd. Selected dates for the control group include September 17th, September 24th, October 15th, and October 24th. The control group will receive standard education regarding fever and its appropriate management, whereas, the intervention group will watch a brief 3-minute video on fever obtained from the healthychildren.org website and will be provided a brochure entitled, "Fever and Your Child." Subjects for the intervention and control group will be recruited by a convenience sample, where parents who present with complaint of feverish children between the ages of 6 months to five years will be asked to participate in the fever education project. Each participant will be offered a

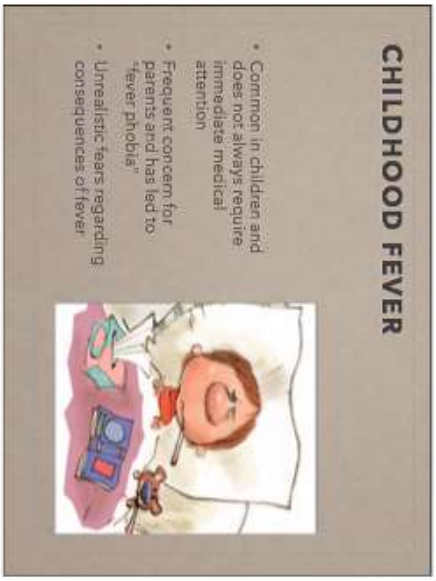
$5 visa gift card as a modest incentive for participating in the project. On project implementation days, the MA will decide on eligible participants based on the age of the patient and a chief complaint of fever for the visit. Once parents are made aware of the project as well as the gift card incentive, they will be given a demographics questionnaire to fill out. Participants should not be provided details regarding the control and intervention group, nor which group they will be placed in. Once again, the control group will be provided standard fever education and will be asked to fill out a fever management questionnaire at the end of their visit. They will also be given a pre-stamped envelope with a control specific satisfaction survey to be mailed back within 2 weeks. The intervention group will be recruited in the same manner and will be shown a fever video on an iPad mini while waiting for their child to be seen in the designated exam room. Blair will provide the intervention subjects with the fever pamphlet upon entering the room and the MA will provide them with the fever management questionnaire and satisfaction survey before leaving the exam room following their visit with Blair. Once the participants in either group complete the fever management questionnaire, they will be provided the visa gift card. I hope to recruit approximately 100 subjects divided into two groups and plan to be present on implementation days.

Thank you in advance for all your help this semester and please let me know if you have any questions!

Teresa ☺

Appendix D

Fever Education PowerPoint for Clinical Agency Staff



CONTROL VS INTERVENTION PROCEDURE

- CONTROL GROUP
- Parent presents with c/o fever in illness in his/her child
- MA briefly explains fever project to parent
- Willing participants complete demographics sheet in exam room
- Standard education
- FMQ and C-specific satisfaction survey provided at the end of visit
- Walmart gift card given to participant
- INTERVENTION GROUP
- Parent presents with c/o febrile illness in his/her child
- MA briefly explains fever project to parent
- Willing participants complete demographics sheet in exam room
- Fever video started by Teresa, NP student
- Brochure given to subject by MA at the beginning of exam
- FMQ and I-specific satisfaction survey provided in exam room at the end of visit
- Walmart gift card given to participant

INTERVENTION EDUCATIONAL METHODS

http://vimeo.com/73944754

"Fever and Your Child" Brochure

WHEN??

- Intervention and control groups will be alternating and implemented on separate days
- There will be approximately 4 days for each or as many days as it takes to recruit a total of approximately 100 subjects
- I-days: Sept. 15th, 22nd, and Oct. 13th & 22nd.
- C-days: Sept. 17th, 24th, and Oct. 15th, & 24th.

THANK YOU!
ANY QUESTIONS?