

THE EFFECT OF NURSE-LED EDUCATION REGARDING DAILY
LIFESTYLE MODIFICATION AND PATIENT EDUCATION
ON THE MANAGEMENT OF PEDIATRIC
ATOPIC DERMATITIS

by

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ABSTRACT

Aim: This study was conducted using action research methodology to try and find out what would happen if evidence-based, nurse-led education regarding Atopic Dermatitis was implemented. The research question was: (1) can targeted nursing interventions and education increase the parents' confidence in dealing with a diagnosis of AD; (2) lower the parents' overall stress level; (3) lower the child's overall stress level; and (4) increase the child's comfort level?

Method: A convenience sample of 10 pediatric patients with a current medical diagnosis of Atopic Dermatitis and at least one legal caregiver with a self-report of misinformation or a lack of education regarding Atopic Dermatitis was used in the study. The Transtheoretical Model of Change was implemented to provide a foundation of education that was rooted in evidence-based theory.

Background: Pediatric Atopic Dermatitis (AD) patients and their families become frustrated and tired of battling this chronic skin disorder. Parenting a child with a chronic illness can result in significant physical and psychological strain (Streisand, Mackey, & Herge, 2010). The incidence of pediatric Atopic Dermatitis has increased 2 to 3 fold in the last 30 years, and the condition is a common reason for pediatric visits to family physicians (Buys, 2007). Dermatology is a highly specialized field, and short of handing the patient or parent a prescription for a steroid, very little patient education follows an Atopic Dermatitis diagnosis.

Results: Introductory telephone calls indicated the need for substantial education about the pathophysiology of AD and non-pharmacologic methods to treat AD. The telephone call and the Facebook support group provided the above referenced education during the study. Both the week three and final questionnaires provided overwhelmingly positive responses during both phases of the study.

Conclusion: Targeted nursing interventions and education can increase the parents' confidence in dealing with a diagnosis of AD; (2) lower the parents' overall stress level; (3) lower the child's overall stress level; and (4) increase the child's comfort level.

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CHAPTER I

Introduction

Pediatric Atopic Dermatitis patients and their families become frustrated and tired of battling this chronic skin disorder. Parenting a child with a chronic illness can result in significant physical and psychological strain (Streisand, Mackey, & Herge, 2010). The incidence of pediatric Atopic Dermatitis has increased two to three fold in the last 30 years, and the condition is a common reason for pediatric visits to family physicians (Buys, 2007). The impact of Atopic Dermatitis on the physical, psychological, and social wellbeing of affected children, their parents, and family, is substantial (Lewis-Jones, 2006).

Atopic Dermatitis (AD), also known as eczema, is a chronic skin disorder that usually occurs during infancy, during childhood, and occasionally during adulthood. Atopic Dermatitis is one of the most common chronic childhood skin disorders affecting up to 20% of children in the United States and recent data show that the prevalence is increasing for unknown reasons (Nutten, 2015). Atopic Dermatitis in its severe form can be debilitating for the child. Children can experience tremendous sleep disturbances, mood changes, and increased risk for infection. Symptoms of AD include patches of dry, scaly, and/or cracked skin that is markedly pruritic. Classic locations for exacerbation are the elbows, backs of knees, the hands, and scalp.

Atopic Dermatitis is thought to be the result of an inherited over-active immune system or genetic defect that causes the skin to lose abnormally large amounts of moisture, but in general the pathophysiology remains poorly defined (Kim, 2015). There are two main hypotheses that have been proposed regarding the development of AD: (1) a primary immune dysfunction; and (2) an epithelial-barrier disturbance (Kim, 2015). The only aspect of AD that is well understood is that it is a complex immunological cascade. The major elements in immune cell dysfunction are the Langerhans' cells, inflammatory dendritic epidermal cells, monocytes, macrophages, lymphocytes, mast cells, and keratinocytes, all of which interact through an intricate web of cytokines leading to an overabundance of Th2 cells over Th1 cells (Leung & Beiber, 2003). In addition to playing various roles of protection, Th1 and Th2 cells are responsible for different types of immunopathological reactions and more specifically, Th2 cells are responsible for atopic disorders in genetically susceptible individuals (Kim, 2015). When the Th2 cells are dominate, levels of IgE increase and trigger powerful inflammatory reactions. AD patients can have up to ten times the normal level of IgE their blood than those with a healthy immunological cell responses (Kim, 2015).

Another important protein that plays a significant role in normal skin is filaggrin. This protein works with keratin to allow for the normal shedding of skin cells and also provides a natural moisture/lipid barrier. When there is a mutation in the gene filaggrin, the skin barrier is compromised, dry skin begins, and further complicates and contributes to the AD process (Nemoto-Hasebe et al., 2008). Normally, every skin cell has two copies of the filaggrin gene, but those with AD only have one copy. You only need one copy of the gene to form a skin barrier, but two copies are important for skin barrier

repair. Up to 80% of all patients with AD carry filaggrin gene mutations, making it the strongest known risk factor for AD (Palmer et al., 2006).

A personal 33 year history of dealing with Atopic Dermatitis and having a child with AD, gave a tremendous insight into the gravity of this condition, and how little education is provided by primary care providers. Pediatricians are overwhelmingly dismissive of this condition, prescribing a steroid, and providing little in the way of follow-up. Parents are inevitably going home without an appropriate understanding of the disease, unaware of the fact that we cannot cure AD, and using products that are contributing to tremendous exacerbation. It was not until realizing that my own daughter would indeed be affected by this condition that intense efforts were made to understand this disease, and a search for answers to finally help both myself and her, ensued. It was clear along the way that many other parents were desperate for help for their children. A recurring theme was present, a complete lack of education from their pediatrician or nurse. Why? Do nurses know how to help patients and parents of children with AD? The overwhelming answer is, no. Dermatology is a highly specialized field, and short of handing the patient or parent a prescription for a steroid, very little patient education follows that diagnosis. In addition, the internet is filled with misinformation. Yet, it is the major source of information for parents who feel perplexed and helpless to relieve their children of discomfort. Nurse-led AD education programs are an effective model of delivering structured education to parents of children with AD (Ersner et al., 2013). Therefore the research question is: Can targeted nursing interventions and education:

- (1) increase the parents' confidence in dealing with a diagnosis of AD;
- (2) lower the parents' overall stress level;

- (3) lower the child's overall stress level; and
- (4) increase the child's comfort level?

There is a plethora of literature that shows the benefits of nurse-led education, but for AD, there is little to show how effective nurse-led education would be and if it could indeed lower stress levels and increase comfort. This study was created to answer that question and provide to a small group of parents the education and help they so desperately wanted and needed in order to improve patient outcomes and decrease caregiver fatigue.

Theoretical Framework

The Transtheoretical Model of Change supports the idea of behavior change which is crucial to the success of the AD patient and family. This specific theory is applicable because it accepts the fact that behavior change is a long-term process and is also a user friendly approach for the nurse and the patient (Bradley-Springer, 1996). The Transtheoretical Model of Change was chosen for this research because it has become one of the most widely used program planning models in health promotion because it is the most validated with research (Spencer, Adams, Malone, Roy, & Yost, 2006).

The Transtheoretical Model of Change

The stages of change are the core components of the Transtheoretical Model of Change and can be applicable for both the acquisition and the cessation of behaviors. The progression from one stage to the next does not always occur in succession but rather is fluid and unpredictable and can come with regression to a previous stage. This theory consists of four components: stages of change, decisional balance, processes of change, and self-efficacy, and is used to develop effective intervention strategies to promote

health behavior change. The stages of change are precontemplation, contemplation, preparation, action, and maintenance (DiClemente, Salazar, & Crosby, 2013).

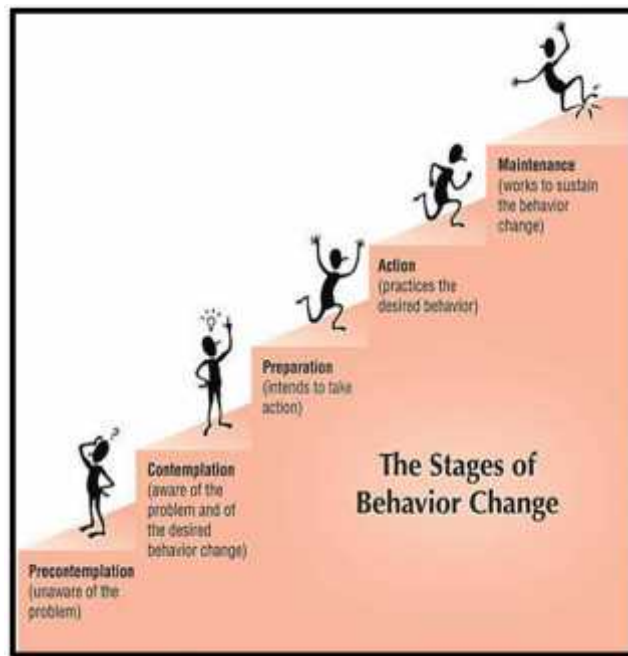


Figure 1. The stages of behavior change within the Transtheoretical Model of Change.

Precontemplation

According to DiClemente, Salazar, and Crosby (2013), the precontemplation stage is the stage in which people have no intention to take action in the foreseeable future. It may be because of any of the following reasons: they lack information or do not have enough information about the consequences of their behavior(s); they are not confident in their ability to change after many failed attempts; or they are not aware of the need to change their behavior. As is the case many times with AD patients, they are simply unaware of what needs to take place because of lack of education. There are times that caregivers are resistant to change for the pediatric patient in which case, a tremendous effort is made to provide education in an effort to initiate behavior change for the child.

Contemplation

In the contemplation stage, decisional balance comes into play as people start to look at the positives and negatives of changing their behavior (DiClemente et al., 2013). As people ponder the negatives and positives and start to weigh their significance, it is important to follow up with behavioral change interventions that will encourage the transition between contemplation and preparation. Some of these interventions may include: (1) minimizing the negatives and barriers to behavior change; and (2) enhancing the positives of behavior change (DiClemente et al., 2013). In regard to AD, this is where nursing staff help caregivers to identify all the positive changes that can result from behavior modifications aimed at decreasing AD exacerbations, and allow the caregiver or patient to determine their own readiness to change.

Preparation

During this stage, people intend to adopt the new behavior in the near future (DiClemente et al., 2013). They may have done more research, or talked with others who are well-versed in the topic, thus influencing their decision to proceed with the behavior change. AD patients and caregivers can at times reach this stage quickly when given thorough education about the disease process. If during the precontemplation stage there was simply a lack of education or misinformation, the patient/caregiver is eager to adopt new behavior modifications in an effort to increase comfort level.

Action

This stage indicates that lifestyle modifications have been implemented. However, it does not qualify as action until the behavior changes reduce the risk of the

undesired behavior (DiClemente et al., 2013). In regard to AD, one would have needed to implement all the desired behavior modifications to reach the action stage. During this phase, relapse is not uncommon. AD relapse can frequently be attributed to: a busy schedule; running out of the appropriate products; forgetfulness; lack of motivation; or to renege on previously agreed upon product usage. If/when this occurs, education is reinstated in effort to reestablish positive behavioral changes.

Maintenance

In the final stage, there is still work to be done to prevent a relapse but because the person is maintaining, their efforts can be less focused compared to the action phase. Relapse becomes less of a fear in this stage, but is still a possibility. Essentially, it is important to understand that the Transtheoretical Model of Change supports the idea of behavior change as evolutionary, not revolutionary (Prochaska, Redding, & Evers, 2008).

Parents will typically admit to not realizing the need for a complete change in behavior and product usage, as a part of long-term treatment for atopic dermatitis patients (precontemplation). This theory allows the parent and patient to move through these processes and changes, all the while understanding that regression is possible, and should not be seen as a failure. When these behaviors are understood, it can make the education process less frustrating for the educator. Once parents realize the need for these changes, education and preparation begin so that they will understand how to implement the new changes. The families then take this information home and utilize it daily. The hope is that they continue to use this information and the patient begins to experience relief. However, it is not uncommon for the parent/patient to regress and begin using inappropriate products that lead to exacerbation or abandon the process completely.

Success may vary as new therapeutic measures are introduced and patients and parents truly come to understand what best gives relief and provides control of the condition.

Assumptions and Limitations

Participants were pediatric AD patients and their primary caregivers. The AD was uncontrolled and parents lacked appropriate AD education per self-report. It was also assumed that all participants responded truthfully and carried out the nurse led instructions to the best of their ability. Limitations included that all communication was via telephone or a private Facebook page rather than in person. Additionally, only nonpharmacologic education was given. It is a well-known part of research that most AD patients will require a topical corticosteroid (TCS) for long-term effective management. However, the intent of this research was to employ additional nonpharmacologic techniques outside of prescriptive therapies that could be utilized singularly or as an adjunct to a prescriptive treatment approach.

CHAPTER II

Integrative Review of the Literature

Atopic Dermatitis can be managed in a variety of ways, but for the purposes of this research only nonpharmacologic methods were presented to the research participants. The purpose of this chapter was to identify areas where a knowledge deficit exists and examine a body of literature that was relevant to the research question. While there is a large body of information regarding nonpharmacologic management of AD, it is also quite apparent that there is a tremendous amount yet to be learned. Much of the quantitative research used to support the current standard of care has been obtained from research studies that are quite dated but arguably solid research. This review of literature addresses the following areas: (1) emollients and their role in AD management, (2) the quality of life for AD patients, (3) cleanser versus soap, (4) sodium hypochlorite and its role in AD, and (5) the importance of making sensitive and fragrance-free choices.

Emollients

The quantitative research conducted by Lucky, Leach, Laskarzewski, and Wenck (1997), is one of the most commonly referenced studies regarding emollient use in AD patients. This research looked at the effectiveness of emollient use as an adjunct to steroid use for the treatment of mild to moderate atopic dermatitis. Twenty-five children ages 3 to 15 years were studied for three weeks and were compared to a using a steroid alone. The adjunctive therapy group received a once-daily application of hydrocortisone 2.5% cream and a water-in-oil cream equivalent to the adjunctive regimen. The other

group received twice-daily applications of hydrocortisone cream 2.5%. Significant improvements in both groups at the 7 day ($p < 0.005$) and the 14 day ($p < 0.005$) were observed. No significant ($p < 0.545$) were observed between the two groups thus leading the researchers to conclude that emollient therapy offers a steroid sparing alternative to using steroids alone (Lucky, Leach, Laskarzewski, & Wenck, 1997). This research demonstrated that using a moisturizer is an equally important part of AD therapy and can be helpful in decreasing steroid use and restoring the integrity of the skin barrier.

A quantitative assessment by Chiang and Eichenfield (2009), evaluated hydration status in 10 pediatric patients, five with AD and five with healthy skin. All test subjects were evaluated by using four different treatments: bathing alone without emollient application, bathing and immediate emollient application, bathing and delayed application, and emollient application alone. The emollient used in the study was Cetaphil Cream which is a non-prescriptive, over the counter (OTC) choice for parents. Skin hydration was assessed and the emollient alone application was found to be significantly greater in AD subjects ($p < 0.05$) compared to all other regimens. This study showed that bathing and moisturizing regimens are directly related to skin hydration in AD patients. In addition, the AD subjects did not retain moisture as well as those subjects with normal skin which further proves the need for frequent emollient use for AD patients. It is important to note that bathing followed by emollient application does not decrease skin hydration, in contrast to bathing without emollient application (Chiang & Eichenfield, 2009) and recommendations to apply emollients frequently supports best practice.

Current clinical practice suggests the use of a ceramide-dominant cream in the treatment of AD. Ceramide-dominant creams replenish ceramide which is markedly reduced in the skin of AD patients and replenish intercellular lipids preventing skin barrier break-down (Withers, 2013). Ceramides are a type of lipid that help keep moisture in the skin. These creams contain the same balance of lipids as your skin and claim to be beneficial for AD patients. There are new prescription emollient devices that can be used but for the purposes of this research there are also over-the-counter ceramide creams that are currently recommended. Quantitative research by Chamlin et al. (2002) supports current practice guidelines. Twenty-four children participated in the study and continued their prior therapy but substituted their moisturizer with a ceramide-dominant barrier repair emollient. Replacement moisturizer was applied twice daily to both affected and unaffected skin areas. Because of the significant improvement in all patients at 12 weeks, the applications were decreased to once daily. Patient improvements in Scoring of Atopic Dermatitis (SCORAD) values at the three week interval ($p < .05$) for 22 out of 24 patients were significant. Improvements at 12 weeks and 20 and 21 weeks compared to six weeks were $p < .01$. This research presented that ceramide-dominant barrier emollients are a safe and effective adjunct to AD management (Chamlin et al., 2002) and further enhances the research from Lucky, Leach, Laskarzewski, and Wenck (1997). Because there are effective non-prescriptive ceramide-dominant creams available over-the-counter, nonpharmacologic management becomes easier and less expensive.

A randomized controlled trial by Miller et al. (2011), concluded that over-the-counter moisturizers were as effective as prescription barrier creams. This is great news for parents of pediatric AD patients. Furthermore, this research enhances the nurse's

ability to offer nonpharmacologic education to parents. Thirty-nine patients ages 2 to 17 years, with mild to moderate AD were randomized to receive one of three treatments, two being prescriptive creams and one being over-the-counter. Research participants were asked to apply three times per day for a total of three weeks. No statistically significant difference for efficacy between the three different treatment options was observed, but the over-the-counter options was found to be 47 times more cost effective than the two prescriptive options (Miller et al., 2011).

Quality of Life

Research regarding quality of life for parents and patients dealing with an AD diagnosis, has been largely qualitative. AD is becoming so widely prevalent and yet so many are still struggling tremendously due to lack of education. Gore, Johnson, Caress, Woodcock, and Custovic (2005), and Santer, Burgess, Yardley, Ersser, Lewis-Jones, Muller, Hugh, and Little (2013), conducted qualitative interview studies with a pediatric focus on AD quality of life. The 2005 study was data regarding the quality of life for 31 parents caring for infants with AD, and the 2013 study was 28 families of children with AD. The 2005 study was designed to: (a) explore which symptoms parents find most troublesome for themselves and their baby; (b) obtain parents' views on the information they would most like to be provided with regarding their baby's AD; (c) identify how involved parents would like to be and how involved they feel they currently are in decisions about their baby's AD treatment; and (d) obtain parents' views on factors which help and hinder them in taking part in treatment decisions (Gore, Johnson, Caress, Woodcock, & Custovic, 2005). Of particular interest were parents reporting: (1) babies were itching, scratching, losing sleep, irritable; (2) remarks that their babies' symptoms

were often not taken seriously, and that diagnosis and treatment were often delayed, leading to more severe symptoms; (3) many parents specified the need for a skin care plan, explaining exactly which treatments to use, and how to best use them and how to respond to improvements or flares; (4) parents typically considered that information-giving was insufficient in quantity and lacked detail which required them to actively seek more information to help them deal with their baby's condition; and (5) almost all parents, 28 out of 31, desired some form of written information and practical demonstrations on application of topical treatments (Gore, Johnson, Caress, Woodcock, & Custovic, 2005). Similarly, the 2013 study was developed to explore caregivers' experiences of barriers and facilitators to treatment adherence with their child (Santer et al., 2013). The findings of the 2013 study indicated that treatment barriers included: (1) caregivers beliefs about eczema treatment; (2) the time consuming nature of applying topical treatments; and (3) child resistance to treatments. Both studies confirmed that there is an existing need for improved education for parents of children with AD, as this process results in mental and physical exhaustion for both the caregiver and the child. It is plausible that nurses could successfully fulfill this role so that parents can refrain from seeking out other routes of education such as the internet, where misinformation is so readily available.

Another qualitative study conducted in 2004 by Chamlin, Frieden, Williams, and Chren, had a similar focus as the two previous qualitative studies, but adds a dermatologist's perspective. This study used 23 parents of AD children, five pediatric dermatologists, and one general dermatologist. The open-ended questions generated a total of 181 specific quality of life effects from both parents and experts regarding AD.

The effects were categorized into four domains: (1) physical health, (2) emotional health, (3) physical functioning, and (4) social functioning, and were further separated as an effect on the child or parent. For children, sleep disruption due to itching/scratching was the most prevalent physical symptom. In fact, 22 of the 23 parent focus sessions and all of the expert interviews, reported sleep problems among the parent, the child, or both. Itching and scratching were unanimously reported in all of the focus sessions. Sixteen out of 23 parents reported co-sleeping as a way to improve the sleep of their child but further reported that this method disrupted their own sleep. In agreement with the previous qualitative studies, emotional symptoms such as: irritability, fussiness, guilt, and self-blame were described in 12 out of 23 parent interviews. Additionally, 11 out of 23 parents indicated that the reaction to the AD itself from the public, friends, and relatives, was emotionally stressful (Chamlin, Frieden, Williams, & Chren, 2004). This study was very similar in its aim, but further validated the results by including a dermatologist's perspective, thus enhancing its professional credibility.

A quantitative study approach on quality of life from 2015, reached similar conclusions (Pustisek, Zivkovic, & Situm, 2015). Parents of children with AD ($n = 171$) participated by completing the Family Dermatology Life Quality Index, the Patient-Oriented SCORAD, the Perceived Stress Scale, and a general questionnaire during a regular follow-up visit. Applicable results were that 61.5% of parents had a strong fear of corticosteroids ($p = 0.006$); family quality of life was significantly correlated with the SCORAD index, PO SCORAD index, itching, sleep disturbance, and PSS ($p < 0.001$); and questionnaires indicated that AD had a negative effect on parents' quality of life (Pustisek, Zivkovic, & Situm). Even though this study was quantitative and the other

qualitative they are connected in the author's purpose, to show that the parents of children with AD could use additional education to help decrease their level of stress in dealing with this already stressful chronic condition.

In 2014, a quantitative study cross-sectional study sampled 64 parent-child dyads to examine the relationships, parents' self-efficacy for managing AD, self-reported performance of management tasks, competence with providing treatment, and AD severity (Mitchell, Fraser, Ramsbotham, Morawska, & Yates, 2014). Parents completed self-report questionnaires and AD severity was scored using the Scoring Atopic Dermatitis Index (SCORAD). Children were ages 2 – 12 years, confirmed diagnosis of AD, AD history of greater than three months, and no other chronic health conditions other than asthma or allergies. Results identified significant relationships ($p < .05$) between parents' self-efficacy and disease severity, child behavior difficulties, parent depression and stress, and parenting conflict. The emerging theme from this study was that self-efficacy was a likely mediator for all of the above relationships as it could improve child behavior making management of AD more successful.

All of the studies indicated that quality of life is a topic of interest for patients with AD and their caregivers. Their purposes varied slightly, but all reinforced that parents need additional help and tools to improve the quality of life while dealing with this difficult chronic diagnosis.

Soap-free Cleansers

In dermatology, soaps are frequently labeled as harsh, moisture-stripping, and skin-drying. Traditional soaps are considered to exacerbate the delicate balance of skin hydration needed for AD patients. In addition, washing twice daily with a classic alkaline

soap causes damage to the skin barrier function that could result in increased colonization of gram-positive bacteria (Bikowski, 2001).

A quantitative study conducted during the summer months, tested the effects of bathing with a weakly acidic cleanser on pediatric Atopic Dermatitis (Kim et al., 2012). Children were enrolled ($n = 96$) and parents were educated to bathe them once daily with mildly acidic cleansers, and to apply emollients for 14 days. Parents were taught to wash the cleanser off completely, dab dry with a towel, and to apply the emollient within three minutes of towel drying. Parents recorded the frequency of baths given and the patient's symptoms. Patients were then divided into two groups, based on adherence to the study protocol. The poor adherence group (group B) was defined as greater than or equal to two bathless days in the 14 day time period. The good compliance group (group A) was defined as less than or equal to one bathless day in the 14 day time period. In group A, itching and insomnia improvement were statistically significant ($p < 0.001$). This study was successful in proving that daily bathing using a weakly acidic soap improved patient outcomes and decreased the clinical severity of pediatric AD, however its limitation was that it was only done in the summer months to exclude seasonal variations that could influence outcomes.

A small, quantitative, open-label, study conducted by Brandt, Meckfessel, and Lio (2014), studied the tolerability of Cetaphil Restoraderm® body wash in AD patients. One other previous open-label study testing Cetaphil Restoraderm® was conducted in 2012 and showed overwhelming favorability to the product, but the manufacturer of the product funded the study. The more recent 2014 study was not funded by the manufacturer. Subjects were between the ages of 3 to 70, with 64 enrolling and 57

completing the study. The dermatologist assessed a statistically significant ($p = .0327$) decrease in erythema, dryness, and roughness. The study participants assessed a statistically significant ($p = .001$) decrease in itching. In addition, the quality of life scores significantly improved ($p = .005$) from baseline. Although these two studies were testing different components of the cleansing process, the end result still concluded that mild, weakly acidic, cleansers are best practice for AD patients and overwhelmingly preferred over soaps.

Sodium Hypochlorite

In recent years using sodium hypochlorite or bleach baths have become used, but seemingly controversial. There is both literature to support it and literature that states is not helpful. Interestingly enough, it is still recommended today as best practice by the American Academy of Dermatology and overwhelmingly used by practicing dermatologists who definitively argue that it significantly improves the skin of AD patients.

Research indicated that *Staphylococcus aureus* plays a large role in AD, but the jury is still out on its precise role (Boguniewicz & Leung, 2010). However, researchers at the University of Michigan were conducting an unrelated study on mast cells using mice (funded by the National Institutes of Health), when they made an unexpected link to AD by chance. In this study, the researchers reported that a little-understood delta toxin became the focus and began exploring its power to provoke mast cells to cause inflammation (Nakamura et al., 2013). The study concluded that the delta toxin is produced by *Staphylococcus aureus* and causes immune system cells in the skin to react in a way that produces the eczema-like rashes. This research was a ground-breaking

discovery and has led to further research to establish a direct link that, if accurate, could lead to the possible development a receptor blocker. This receptor blocker would prevent the delta toxin from binding to mast cells thus eliminating the irritant before it causes a problem. Further research is needed using humans instead of mice, but regardless dermatologists and researchers know conclusively that *Staphylococcus aureus* plays a role and actively use sodium hypochlorite as part of the treatment plan for AD patients to reduce the risks associated with developing bacterial resistance.

A randomized, investigator-blinded, placebo-controlled study involving 31 patients for three months with infected atopic dermatitis was conducted using bleach baths (Huang, Rademaker, & Paller, 2011). However, sodium hypochlorite was not the only variable used in the study. Participants were also given 50mg/kg of cephalexin three times a day for two weeks prior to randomization. In addition, the treatment group received intranasal mupirocin ointment twice a day for five consecutive days each month and sodium hypochlorite bleach baths. The placebo group received intranasal petrolatum ointment and plain water baths. Both groups experienced improvement over baseline at the three month follow-up, but the improvement was much greater in the treatment group. For example, at three months, the average severity index score was 6.8 in the treatment group (down from 22.1 at baseline) compared with 13.4 in the placebo group (down from 16.6). However, those who argue that bleach alone is ineffective, use this study to demonstrate that other medical components are needed in addition to bleach baths.

In 2013, patients aged 2 to 30 with moderate to severe AD were enrolled in a prospective, randomized, placebo-controlled study, to evaluate the safety and efficacy of bleach as an adjunctive treatment (Wong, Ng, & Baba, 2013). Unlike similar earlier

studies, this study used only diluted bleach or distilled water baths for 10 minutes, twice a week for two months. Patients ($n = 46$) were recruited and 36 patients completed the study. The efficacy assessments showed significant difference between the treatment and the placebo group ($p = 0.02$). Patients in the treatment group showed a significant reduction in the Eczema Area and Severity Index (EASI) scores at both one and two months ($p < 0.001$). In the bacteriological assessment, the treatment group had a 41.9% reduction in *S. aureus* density at one month and continued reduction to 53.3% at two months. There was also a significant reduction in pruritus scores for the treatment group at two months from baseline ($p = 0.02$). This study concluded that diluted bleach baths clinically improved AD in as little as one month with greater improvement at two months.

Those who argue that bleach is ineffective dismiss the study by Wong, Ng, and Baba (2013), because it was conducted in Malaysia which has been found to be higher in humidity levels, which is beneficial for the skin of AD patients. However, some argue that this is a far-fetched attempt at disproving a perfectly legitimate bleach study. There are few studies to support or disprove the efficacy of bleach baths as an adjunctive treatment therapy for AD patients, but physicians today implement it as best practice and overwhelmingly support its use.

Choosing Fragrance-Free/Sensitive

Dermatologist generally recommend fragrance-free products to AD patients. However, there is a surprising lack of research to support this claim. Indeed, according to Rattohi, Heyeoso, Joiaoteo, & Batkettes (2001) researchers only study less than 30 of the

2,500 chemicals that might be found in products used on the skin. This area has much potential for further research.

A quantitative 2010 study conducted in Spain, looked at patch testing in children with hand eczema. This was a five year retrospective study for children ages 0 – 15. There were 111 children with hand eczema in the study. The children were patch tested using an extended Spanish Research Group in Contact Dermatitis and Cutaneous Allergy (GEIDAC) baseline series. One of the allergens used for testing was Fragrance Mix I (FM). This baseline series Fragrance Mix I contains 8 commonly sensitizing fragrances: (1) Amyl cinnamal; (2) Cinnamyl alcohol; (3) Cinnamal; (4) Eugenol; (5) Geraniol; (6) Hydroxycitronellal; (7) Isoeugenol; and (8) Oak moss absolute. Of the 111 children with hand eczema, 52 (46.8%) had at least one positive patch test and the fragrance Mix I was the third most common allergen found within that patch testing. The recommendations of this study were to have all children with chronic hand eczema patch tested. However, what I would like to infer by using this study is that AD patients show hypersensitivities to fragrances. The information for the purposes of this research is to reference that the use of fragrance-free products further limits the potential for exacerbation with or without a known allergy.

A similar quantitative study conducted in 1998 was aimed at evaluating contact sensitivities in pediatric patients with AD (Giordano-Labadie et al., 1998). Children under the age of 16 years who attended a clinic for AD (N=137) were studied for 14 months. At the time of testing, the participants had not been treated with systemic/topical corticosteroids or antihistamines for one week prior. The patch testing was done on 114 children and contained various chemicals known to cause sensitivities, one of which was

Fragrance Mix I. Contact Sensitization occurred in 43% of all tested children (49/114). The top three allergens were metals (19.3%), fragrance mix (4.4%), and lanolin (4.4%). All of the positive patch testing results were determined to be relevant, as avoidance of the contact allergen(s) lead to statistically significant improvement ($p < 0.05$) of SCORAD within six weeks (Giordano-Labadie et al., 1998). This study was very similar in its purpose to the previous quantitative study, fragrance sensitivities are a risk with AD patients and avoidance is best.

In 2003, a hand eczema study was conducted to determine patterns of contact sensitivity in Indian patients (Suman & Reddy, 2003). Patients with ages ranging from 6 – 58 years with chronic hand eczema (N=100), were patch- tested with allergens obtained from the Indian Standard Battery of 28 antigens. In addition to those 28, soaps, detergents, Savlon, and Dettol, were used in 1% concentration. The results were read at the 48 hour and 72 hour protocol established by the International Contact Dermatitis Research Group (Suman & Reddy, 2003). The patch testing revealed a positive result to one or more allergens in 67% of the cases. However, this study revealed nickel sulfate (20%) and potassium dichromate (18%) to be among the most common sensitizers. Potassium dichromate is present in laundry detergents that contain phosphates. Fragrance-free laundry detergents are phosphate, dye, and fragrance-free. The American Academy of Dermatology (2016) currently recommends fragrance-free laundry detergent for AD patients and the study results further solidify that decision by eliminating proven allergens that cause exacerbation.

All of these studies concurrently infer that AD patients are notably sensitive and require products that are free from common allergens reflected in patch testing studies.

Although each of these studies were different in their aim, it can be accurately deduced that choosing fragrance-free and sensitive products is in the best interest of AD patients.

CHAPTER III

Methods

This chapter outlines the research methods used to support the research question, an overview of the qualitative and philosophical background of the paradigm, the research setting, population access, inclusion criteria, data collection and analysis, and ethical considerations.

Research Methodology

The use of qualitative research has increased over the past two decades (Strauss & Corbin, 2006). Qualitative research was employed to gather data and through this method the feelings and emotions of the participants could rise to the surface and be explored. The purpose of data analysis in qualitative research is: (1) to answer the research question; (2) understand the research participants' viewpoints (3) address the phenomena of how/why; and (4) study the real-world situations as they occur (Acosta & Goltz, 2014). Because the study itself was exploratory in nature, using the qualitative research method of action research (AR), was further justified as a means of collecting subjective data.

Action research (AR) is the study of a social situation carried out by those involved in that situation in order to improve both their practice and the quality of their understanding (Winter & Munn-Giddings, 2001). It is powerful tool for health education and promotion practitioners who want to focus on improving the quality of their programs and services (Acosta & Goltz, 2014).

First used in 1946 by Kurt Lewin, a social scientist concerned with intergroup relations and minority problems in the United States, the term action research (AR) is now identified with research in which the researchers work explicitly with and for people rather than undertake research on them (Reason & Rowan, 1981). Acosta and Goltz (2014), have dissected the intended aim of AR in the following manner:

- (1) Connects theory, research, practice, and education
- (2) Offers an insider's perspective
- (3) Educates and empowers through participation and dialogue
- (4) Is problem-focused, situation-specific, and future-oriented
- (5) Implements evidence-based changes to improve and involve
- (6) Cycles through problem identification, planning, action, and evaluation
- (7) Creates new and practical knowledge that increases understanding through reflection.

In regard to AR, Philips (1987), claimed that all research can do is make a warrantable assertion. It may not be plausible to infer complete truth from the results of our research but rather enough data to make a warrantable assertion, such as Denis Philips suggests. Using this holistic methodology approach is justified by understanding that both action and research are the intended outcomes. The hope is that this method will assist with effective change and allow for the appropriate data collection and conclusions to the study.

Research Setting

The participants of this study were children with atopic dermatitis and their parents or guardians. The setting was via a Facebook support group and consisted of 10

participants and their parents/guardians. The support group was a private group that was password protected. In an effort to avoid a breach of confidentiality, the password was changed on the 1st of each month. The recruitment method was a convenience sample of personal contacts that were affected and patients who were seen during my clinical praxis and consented to participate. The clinic was informed of my intent to recruit participants and they gave their permission (Appendix B).

Introductory Telephone Call

All participants were given an introductory telephone call that provided all the details regarding their participation in the study. Each call was approximately one hour in length and gave the following details: (1) Reading/sending of consent; (2) verbal assent of the pediatric participant; (3) recommendation for two emollients; (4) recommendation for a choice of two different soap-less cleansers; (4) recommendation for using sodium hypochlorite; (5) education about atopic dermatitis; and (6) details about the Facebook support group.

Questionnaires

The key component of the two questionnaires was addressing the research question. Both questionnaires contained the same questions. The three week questionnaire phrased questions in the present tense, and the final questionnaire phrased questions to reflect the conclusion of the study.

Facebook Support Group

The Facebook support group was used as a means to pass along additional information to the participants, and included a self-developed video on recommended product application and caregiver/child involvement. Parents were also encouraged to use

the group as a means of support, to ask any questions of other parents or myself, and was also used to remind participants of their three week follow-up call time.

All participants used personal recommendations given by the investigator and watched a short video on product application suggestions using a game with role play. The video idea was a version of an effectively used game played with the investigators child, and was not originally planned to be a part of the study. After discovering that caregivers were encountering a tremendous amount of defiant and fearful behavior, a brief video was recorded and posted to Facebook to offer an alternative application method for these parents. The video role play event was called, Blob Baby. This game begins with a sequence of events starting with interactively having the child lay out all products before bath time (thus encouraging participation and autonomy), being involved in running their blob water, using blob soap, occasionally using a super power soak (bleach bath), and applying blob products which ultimately created a fun alter ego named, Blob Baby. The child could only become a Blob if they completed all the sequences. A vital part of the role play success was parental participation. At the conclusion of all the steps, when the child was layered with emollients, they were quite literally a blob, and this is how the term was coined. Blob baby had super power pajamas (long-sleeved, long-pant, cotton pajamas) that could super naturally prevent itching. This approach, while potentially effective for all children with AD was specifically intended for children who were scared of their products because of burning, or whom had become defiant to the treatment process for various reasons. All parents were encouraged to try the role play if they felt it would increase their chances for treatment success or lower their child's stress level.

Inclusion Criteria

Study participants were: (1) between the ages of 1 – 16; (2) pediatric patients with a current medically confirmed diagnosis of atopic dermatitis that is uncontrolled and labeled as mild, moderate, or severe; (3) at least one parent or guardian who participated in the research; and (4) a parent or guardian who was willing to follow all non-pharmacologic treatment methods during the course of the research study.

Exclusion Criteria

Participants that were excluded from this study were: (1) no medically confirmed diagnosis of AD; (2) a parent or guardian unwilling to participate in the research; (3) participants that were unwilling to follow treatment methods; (4) pediatric patients over the age of 16 or under the age of 1; (5) pediatric patients who had indications of skin infection.

Data Collection

Parents, who voluntarily agreed to participate in the six week study, received a consent letter (Appendix B), signed the consent letter, and were sent an invitation to a private Facebook group. All participants were a part of this group and received the same information throughout the research study. In addition, each participant agreed to an introductory phone call, a three week follow-up phone call with a questionnaire (Appendix C), and completion of a final research questionnaire (Appendix D).

The introductory phone call was lengthy as it provided the parent/guardian all the information they needed to implement during the research study. The researcher explained the purpose of the study and detailed information about the Facebook group. The follow-up phone call was to allow for any questions or concerns, and to document

the status of the patient through a questionnaire. The Facebook support group was used as a means to pass along additional information to the participants, and included a video on recommended product application and child involvement. Parents were also encouraged to use the group as a means of support, to ask any questions to other parents or myself, and was also used to remind participants of their three week follow-up call time.

Parents/guardians were given a number which was the identification tool used for each child/caregiver team. The numbers were 1-10 and were handed out in succession with signed consent for participation in the study. The three week follow up phone call used a questionnaire in an effort to streamline the phone call to all participants. If parents/guardians had any questions or concerns, those could be asked at the end of the questionnaire. At the conclusion of the six week study, the same questionnaire was given but questions were rephrased to reflect the conclusion of the study.

Data Analysis

During the introductory telephone call, all caregivers were given an overview of AD and what to expect during the study, however, it was apparent that additional education would be needed along the way as the pathophysiology of AD was poorly understood by all participants. Three overwhelming themes emerged: (1) the need for stress reduction; (2) the need for exacerbation control; and (3) lack of education. The Facebook support group was the appropriate vehicle for laying the foundation for this information. In addition, the Facebook page allowed the tracking of each participant's viewing of the information, as the private group setting displayed each time the information was accessed and by whom. Active participation for all posts, comments,

and video, were given by all caregivers and included an enthusiasm and excitement for learning followed by application of their knowledge.

Ethical Considerations

When conducting research, researchers must be aware of the ethical principles. All participants who agreed to be involved in this study were assured of complete confidentiality and privacy regarding their identity and results of these data. The decision to leave the study at any time was at the discretion of the parents/guardians without any repercussion or consequence. A written and signed consent form was reviewed and signed by each guardian/parent. All relevant computer files and groups were password protected. Approval for this research study was obtained from the Institutional Review Board (IRB) at West Texas A&M University (Appendix E). Additionally, the researcher completed all IRB training requirements/procedures involving human subjects before any research commenced.

CHAPTER IV

Results

This chapter introduces the findings of this study and describes and defines the data using a qualitative analysis. Participant profiles were created to allow readers a visualization of the individuals who chose to be a part of this study. The investigator chose a convenience sample and used questionnaires to obtain data from the research participants. The questionnaire method was chosen because it is fixed and immovable. Muijis (2011), found descriptive studies to be particularly well suited for canvassing opinions and feelings, because they are well understood by those administering and responding to them.

Participants

Ten pediatric patients and their caregivers participated in this study and were from various parts of the United States.

Participant number 1

Participant number 1 was a three year old female and her mother. The mother reported that she had made numerous trips to the pediatrician and felt she was not being taken seriously. She said her daughter scratches and does not sleep well. She also stated, the pediatrician recommended Ivory soap and aquaphor (Mother of patient number 1, personal communication, October 26, 2015). The mother described her daughter's areas of involvement to be exclusively flexural in the antecubital and popliteal fossae. She was

using Ivory soap and the aquaphor exclusively to treat her daughter's AD. She uses Gain scented laundry detergent and dryer sheets.

Participant number 2

Participant number 2 was a four year old male and his mother. The mother reported that her son was miserable, needed help, and that she did not have the time or money to keep making trips to the doctor. She said she is exhausted with the whole process and her son said kids at school make fun of him (Mother of patient number 2, personal communication, October 25, 2015). When asked about their current routine, she indicated that her son used Aveeno baby wash and Sun scented laundry detergent. The mother described her son's areas of involvement to be the antecubital, popliteal fossae, ankles, and tops of hands.

Participant number 3

Participant number 3 was a seven year old boy and his mother. The mother indicated that her son had been dealing with this since he was one year old and refused to apply products when she asked him to. The mother's hope was that having someone else ask him to do it for a school project would entice him to use the products. She stated that eczema has caused them so much stress because she wants him to take care of himself and he fights it (Mother of patient number 3, personal communication, October 24, 2015). The patient had antecubital and hand involvement, and currently uses Axe body wash and spray. Mom uses All Free and Clear laundry detergent.

Participant number 4

Participant number 4 was a two year old girl and her mother. The mother indicated that she was afraid to use steroids on her daughter but she could not get the

patches to go away. She stated that she wanted a cure for this so her daughter did not have to suffer any longer, making it very clear that there needed to be a substantial amount of parent education in our introductory phone call. The mother also stated that her daughter scratches in her sleep and fights bath time because it burns (Mother of patient number 4, personal communication, October 24, 2015). Mother used Nivea coconut moisturizing body wash and Aquaphor as her pediatrician recommended. She uses Tide scented laundry detergent. Mother indicated antecubital and popliteal fossae involvement.

Participant number 5

Participant number 5 was an eight year old girl and her mother. Mother indicated that steroids do not work so they quit using them. She also indicated that they use Ivory soap and coconut oil for flare-ups. Mother also stated that finding a way to help her daughter has been a frustrating process for them both and she needs help (Mother of patient number 5, personal communication, October 26, 2015). She uses Gain scented laundry detergent. Mother indicated that the areas of involvement were the popliteal fossae and ankles.

Participant number 6

Participant number 6 was a three year old girl and her grandmother. The grandmother stated that her granddaughter scratches all night and does not sleep well. She also indicated that her local physician is not a pediatrician and told her to use oatmeal baths. The grandmother was angry that nothing was working and said she was fed up (Grandmother of patient number 6, personal communication, October 24, 2015). She uses

Cheer scented laundry detergent. Grandmother indicated that areas of involvement were neck, antecubital, popliteal fossae, wrists, hands, and ankles.

Participant number 7

Participant number 7 was a four year old girl and her mother. The mother prefers not to use medications unless absolutely necessary. She stated that she uses all-natural products in her home and the thought of having to use medications bothers her. She indicated that her little girl scratches all the time and is very cranky in the morning because she does not sleep well (Mother of patient number 7, personal communication, October 26, 2015). She was using California Baby Sensitive Body Wash and makes her own laundry detergent. Mother indicates areas of involvement to be the antecubital and the wrists.

Participant number 8

Participant number 8 was a three year old boy and his mother. Mother stated that she was spending a tremendous amount of money on a direct sales skin care regimen that claimed to eliminate eczema. She reported that it did not help and her son was not sleeping well and fights bath time (Mother of patient number 8, personal communication, October 24, 2015). She uses Dreft laundry detergent. Mother indicated that the areas of involvement were the antecubital and popliteal fossae.

Participant number 9

Participant number 9 was a five year old girl and her mother. Mother stated she was desperate for help and her pediatrician advised her to use Aveeno Oatmeal Wash, Aquaphor, and a mild steroid as needed. She said during the bad flare-ups they both cry but she just does not know what to do anymore (Mother of patient number 9, personal

communication, October 25, 2015). She uses Tide Free and Gentle laundry detergent. Mother indicated areas of involvement to be the antecubital and the popliteal fossae.

Participant number 10

Participant number 10 was a four year old boy and his mother. Mother indicated that they had been using essential oils to try and treat his eczema but it got worse. She said his pediatrician recommended allergy testing, advised her to use a gentle soap (Ivory), and a steroid which she did not have filled. She started using Eucerin cleansing soap (Mother of patient number 10, personal communication, October 26, 2015). She uses Mrs. Meyer's scented laundry detergent. Mother indicated that areas of involvement were the antecubital, popliteal fossae, and ankles.

Results

Week Three Questionnaire

The week three questionnaire was given to all the participants caregivers and the answers were given as "yes" or "no" and were as follows:

- (1) Are you as a parent finding the information given to you at the beginning of this study to be helpful?
- (2) Do you as a parent feel that the information is beginning to increase your confidence in dealing with the struggles that come with pediatric atopic dermatitis?
- (3) Do you as a parent feel this information has lowered your overall stress level in the last three weeks?
- (4) Do you as a parent feel this information lowered your child's overall stress level in the last three weeks?

- (5) Do you as a parent feel like the implementation of this information has increased your child's comfort level in the last three weeks?
- (6) Do you as a parent feel like nurse-led education regarding daily lifestyle modifications has had a positive effect on both you and your child in the last three weeks?

All of the participants answered "yes" to all questions giving an overwhelmingly positive response to the first phase of the study. Any questions or concerns were asked in the Facebook group setting during the first three weeks and all comments and progress were determined to be positive. There was no break in the study, participants carried on as instructed. The following table shows the participant number and the answer to each one of the six questions at the week three mark.

Week three Questionnaire Results						
Participant Number	Answer to question #1	Answer to question #2	Answer to question #3	Answer to question #4	Answer to question #5	Answer to question #6
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes
6	Yes	Yes	Yes	Yes	Yes	Yes
7	Yes	Yes	Yes	Yes	Yes	Yes

8	Yes	Yes	Yes	Yes	Yes	Yes
9	Yes	Yes	Yes	Yes	Yes	Yes
10	Yes	Yes	Yes	Yes	Yes	Yes

Table 1. Week three questionnaire results.

Final Questionnaire

The week three questionnaire was given to all the participants caregivers and the answers were given as “yes” or “no” and were as follows:

- (1) Did you as a parent find the information received during the course of this research study to be helpful?
- (2) Did you as a parent feel that the information increased your confidence in dealing with the struggles that come with pediatric atopic dermatitis?
- (3) Do you as a parent feel this information lowered your overall stress level?
- (4) Do you as a parent feel this information lowered your child’s overall stress level?
- (5) Do you as a parent feel like the implementation of this information has increased your child’s comfort level?
- (6) Do you as a parent feel like nurse-led education regarding daily lifestyle modifications has had a positive effect on both you and your child?

All of the participants answered “yes” to all questions giving an overwhelmingly positive response to final phase of the study. Any questions or concerns were asked in the Facebook group setting during the remaining three weeks and all comments and progress were determined to be positive. The following table shows the participant number and the answer to each one of the six questions at the conclusion of the study.

Final Questionnaire Results						
Participant Number	Answer to question #1	Answer to question #2	Answer to question #3	Answer to question #4	Answer to question #5	Answer to question #6
1	Yes	Yes	Yes	Yes	Yes	Yes
2	Yes	Yes	Yes	Yes	Yes	Yes
3	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes
6	Yes	Yes	Yes	Yes	Yes	Yes
7	Yes	Yes	Yes	Yes	Yes	Yes
8	Yes	Yes	Yes	Yes	Yes	Yes
9	Yes	Yes	Yes	Yes	Yes	Yes
10	Yes	Yes	Yes	Yes	Yes	Yes

Table 2. Final questionnaire results

Additional Findings

There was a noticeable lack of confidence, lack of education, and stress, presented itself in various ways individual to each caregiver. For most, frustration/anger emerged which then carried over into replicated child behavior.

The mother of participant number 3 reports, “When I look at my son, I get frustrated because his skin looks terrible and he won’t take care of himself. He knows what to do and refuses, so I feel like I gripe at him all the time. I know it sounds crazy, but I feel like Eczema has damaged our relationship” (personal communication, October 24, 2015). The mother of participant number 4 reported that, “We have become so discouraged with taking a bath that we don’t tell her anymore. My husband and I just distract her while we prepare everything and then both hold her down to get her washed while she screams” (personal communication, October 24, 2015). The mother of participant number 7 says, “Mornings are extremely difficult for us. My daughter is usually bloody in the morning from scratching and she never wants to wake up for school. I get so angry and she usually ends up crying, it’s terrible and I can’t keep doing this” (personal communication, October 26, 2015). The mother of participant number 8, stated, “My son screams and cries before bath time, he tells us it burns and fights the whole time and then we end up threatening to punish him and sometimes we have to. Bath time is so stressful for all of us and I feel like he doesn’t trust us anymore” (personal communication, October 24, 2015). These are all components of AD that are unnecessary if patients/caregivers are properly educated and patients are properly treated.

For those who did not react with frustration, devastation was the remaining emotion. How tragic to cause anyone such an unnecessary emotional investment into a

chronic condition that can be managed through a small amount of trial and error, a little creativity, ample education, and patience.

After participants had a chance to view the role play video there were 10 likes and five comments. Comments (personal communication, November 2, 2015) under the video were:

- (1) “OMG, I can’t wait to try this!! Thank you!”
- (2) “We are starting this tonight!”
- (3) “LOL! Genius!”
- (4) “I’m going to let _____ watch this and see if he wants to become a blob baby tonight, wish us luck!!”
- (5) “Why are you not writing a book?!”

The caregivers were excited to try this and it was interesting to see a substantial change in their tone as they were learning as well. Two days after viewing the video the mother of participant number 7, posted a comment to the Facebook page stating, “Are you kidding me, all we needed all along was the Blob and some super power pajamas? I can’t even tell you how awesome our last two nights have been! Thank you so much” (personal communication, November 4, 2015). Several others commented in agreement and there were nine “likes” on her post.

Participant numbers 3, 4, 7, and 8, had positive comments at the conclusion of the study in regard to using the role play strategy that was specifically intended to curb their child’s fearful or defiant behavior. The mother of participant number 3 said, “My son didn’t really buy into the role play, but when you personally asked him to do you a favor for school, he did what you asked him to and his skin has improved tremendously! He

told me that it felt a lot better and even agreed to keep using the products you asked him to use” (personal communication, December 7, 2015). The mother of participant number 4 reported that, “My daughter loves becoming the blob every night! We took your advice and quit using the bathtub for a while since she had become terrified of it, now we stand up in a shower with a spray hose and become the blob. Her dad has been so impressed with the whole process and she actually looks forward to our nightly routine now” (personal communication, December 8, 2015). The mother of participant number 7 cried at our last discussion. She stated, “Your help has made our world so much easier. My daughter’s skin has improved, the super power pajamas keep her from scratching during the night, and she is actually resting well, like I said before, you should write a book” (personal communication, December 7, 2015). The mother of participant number 8 exclaimed, “You are a genius, the Blob is the best idea ever! My son absolutely loves this process and told us that he loves being the Blob because it doesn’t burn. He rests better in his super pajamas and we can’t thank you enough” (personal communication, December 9, 2015).

At the beginning of the study, the role play video was not planned for, but it became evident during the introduction of the study that repeated negative behaviors had created an environment of distrust and fear that required the implementation of creativity. The role play scenario was further developed to incorporate all of the treatment components of the study and maximized to be as fun as possible for the child. Changing the course of the treatment plan to include a fun component for the child proved to be the biggest indicator of satisfaction for both the child and the parent.

Chapter V

Discussion

This chapter will interpret the findings of this study, address the treatment recommendations embedded within the review of literature, link a relevance to the nursing profession, and provide recommendations for additional research.

Interpretation of the Findings

This study has determined that targeted nursing interventions and education can increase the parents' confidence in dealing with a diagnosis of AD; (2) lower the parents' overall stress level; (3) lower the child's overall stress level; and (4) and increase the child's comfort level.

Caregivers were presented with recommendations for nonpharmacologic interventions for AD patients. These interventions were successful, as all caregivers and patients experienced exclusively positive changes throughout the course of the study. Caregivers were given education, knowledge, and support, in an effort to foster an environment in which parents and patients could maintain and flourish without substantial frustration. All caregivers enthusiastically embraced the education that was given to them and applied it daily for six weeks with self-reported improvements at both the three and six week study phases. The Facebook support group was a valuable tool that allowed participants to find support and encouragement. Participants commented about the positive results they were seeing, shared ideas, viewed the video, and discussed questions about the pathophysiology of the disease, during the study. While this study did

not focus on the details of the patients' improvement, it was reported that there was an increase in the child's comfort level.

As parents, it is easy to become entangled in the emotional components of their child's care if they are resistant or defiant. Early recognition and discussion of resistance and better awareness of strategies to overcome this may help caregivers to avoid establishing habitual confrontation (Santer et al., 2013). Resistant behaviors, ranging from a simple lack of cooperation to kicking and screaming during treatment, may prompt parents to adopt negative parenting strategies, or to reduce the frequency of therapy, both of which may be counter-productive to successful long-term management and potentially damaging to the parent-child relationship (Santer et al., 2013).

Seeing parents embrace the role play suggestion and interact with their children in a positive, playful, manner reinforced the idea that even small, patient-centered educational approaches, can change the course of treatment success. Upon initiation of this study, the video was not planned for but became an invaluable part of this research. When caregivers used creative play while incorporating treatment for their children, the responses for both the child and the parent were tremendously positive. When parents reacted differently to the treatment process, children replicated the positive behavior, thus diminishing the stress level of both the patient and the caregiver, increasing the comfort level of the patient, and increasing the confidence of the caregiver. Fun and positive parent/child interaction, can improve patient and caregiver outcomes substantially, and relative to these study results, are a recommended method of treatment for all pediatric AD patients.

Treatment Recommendations

There were four recommended treatment changes during the course of this study: (1) Switch to a choice of two different soap-less cleansers; (2) Use two recommended emollients concurrently, one being a moisturizer, and the other being a heavy occlusive; (3) Initiate the use of sodium hypochlorite baths as a measure of skin decolonization; and (4) Ensure that all products are fragrance free and formulated for sensitive skin, namely laundry detergent.

Soap-less Cleanser

Since soaps have an irritant effect on the skin and AD patients demonstrate a diminished irritant threshold, soap-less cleansers are the preferred method of cleansing (Mukhopadhyay, 2011). True soaps, poorly formulated skin cleansers, and overwashing are common sources of SC barrier compromise as they increase transepidermal water loss (TEWL), initiate inflammation, and over time reduce the water-holding capacity of the skin (Ananthapadmanabhan, Moore, Subramanyan, Misra, & Meyer, 2004). These cleansers are known for their superb ability to maintain proper hydration of the epidermal barrier as opposed to a classic alkaline soap. These AD recommended cleansers are non-soap based surfactants formulated at a neutral pH, which helps to provide cleansing benefits without damaging skin integrity (Brandt, Meckfessel, & Lio, 2014). These modern cleansers further employ strategies for long-term maintenance of AD that can positively influence treatment outcomes.

Participants within this study all overwhelmingly approved of their new soap-less cleansers and expressed a desire to continue using it. Every participant commented that their child no longer complained of burning when bathing.

Emollients

Emollients have been used for centuries to protect the integrity of the stratum corneum (SC), the top layer of the epidermis (Telofski, Morello III, Mack-Corea, & Stamatas, 2012). To understand the importance of emollients for treatment of AD patients, it must be understood that the breakdown of the skin barrier initiates a complex exacerbation cascade. In healthy, normal skin, corneocytes are full of water which helps them to swell, resulting in a smooth skin barrier with no cracking (Cork & Danby, 2009). Without cracking, this barrier cannot be penetrated with irritants and allergens, but are instead repelled. These healthy, water and lipid-filled corneocytes, maintain a constant thickness of the SC which produces skin with a smooth, healthy glow, which does not itch (Cork & Danby, 2009). Filaggrin is also an important protein within the corneocyte. Normally, every skin cell has two copies of the filaggrin gene, but those with AD only have one copy. You only need one copy of the gene to form a skin barrier, but two copies are important for skin barrier repair. Because up to 80% of all patients with AD carry filaggrin gene mutations, it becomes likely that the corneocytes are unable to hold on to their water and lipids (Palmer et al., 2006). As the corneocytes shrink, cracks emerge in the spaces between them and they release cytokines (pro-inflammatory mediators) that cause inflammation within the SC, which results in itching (Cork & Danby, 2009).

The definition of emollient is important to this study because it delineates the products that were recommended for use. However, there is a lack of consistency when using this term throughout research, as it usually encompasses both a moisturizer and an occlusive substance (International Skin Care Nursing Group, 2010). For the purposes of this study, the definition of emollient from the International Skin Care Nursing Group

(2010), was applicable: an inclusive term used to define substances whose main actions are to encourage the build-up of water within the SC. Within the study two emollient substances were used: (1) a ceramide-dominant moisturizing cream; and (2) a heavy petroleum occlusive. The cream used in this study was used to actively draw moisture into the SC, and the occlusive was used to trap in moisture and prevent transepidermal water loss (TEWL). Rawlings, Canestrari, and Dobkowski (2004), reported that petroleum jelly reduces transepidermal water loss via evaporation, by 98%. Evidence shows that emollients are an important part of skin breakdown prevention and healthy skin promotion for the AD patient.

All participants were complimentary of the decrease in reported itching and in monitored scratching with the use of both emollients. Four out of 10 participants verbalized that the use of the heavy occlusive during the day was not practical, but all 10 participants used it willingly at night. The cream was approved by all participants, but 3 out of 10 complained about the price of the cream. However, all verbalized plans to continue using it regardless of the price.

Sodium Hypochlorite

When the skin barrier is damaged, an increased colonization of gram-positive bacteria can occur. It is widely accepted that *Staphylococcus aureus* (*S. aureus*) plays a role in the skin of AD patients (Boguniewicz & Leung, 2010). Bacterial cultures have provided evidence of high colonization and infection, found in 90% of AD skin with active exacerbation (Lee & Van Bever, 2014). When the skin barrier is disrupted and the itch-scratch cycle ensues, colonization can occur and lead to potential secondary infection. However, with the emergence of bacterial resistance and concerns regarding

antibiotic overuse, the reduction of bacteria on the skin of AD patients presents a challenge, and according to the World Health Organization (2015), a significant threat to global health.

Sodium Hypochlorite (bleach), has been used in medicine since the 18th century as a disinfectant and antiseptic for cleaning wounds or medical instruments but faded with the introduction of antibiotics (Barnes & Greive, 2013). However, because of the pressing issues regarding bacterial resistance, dermatologists use bleach baths to decrease to bacterial burden on the surface of the skin. Because of the lack of published research that contains sodium hypochlorite as the only substance studied on the skin of AD patients, the evidence does not overwhelmingly support its use or effectiveness. However, dermatologists have seen clinical improvements in their patients and continue to use this method when AD patients present with excessive crusting around eczematous lesions, which could be indicative of *S. aureus* overgrowth, and as a measure of maintenance for prohibiting *S. aureus* overgrowth.

For this study, caregivers were given bleach bath instructions based on the age of the patient and their preferred method of bathing. These instructions followed the protocol of a local pediatric dermatologist with whom clinical praxis hours were obtained. Patients all reported appropriate implementation of the bleach baths and 2 out of 10 verbalized a dislike for the smell. 2 out of 10 used bleach wash instructions for the shower instead of a bath, and 10 out of 10 participants felt like the bleach baths/washes were beneficial in the treatment process.

Recurrent *S. aureus* infections for AD patients can present tremendous risks to their health. Treating *S. aureus* with oral antibiotics can also present risks to their health.

Using Sodium Hypochlorite baths for AD patients is a cost-effective, safe, simple, way to decrease the bacterial burden on the surface of the skin for AD patients (Metry, Browning, & Rousseau, 2007).

Choosing Fragrance-Free/Sensitive

The pathophysiology of the skin of AD patients and justification for using emollients is parallel in its purpose for using fragrance free and sensitive skin products. Sensitive skin is generally defined as abnormal subclinical sensory responses to drugs, cosmetics and toiletries in the absence of visible signs of irritation (Kligman, Sadiq, Zhen, & Crosby, 2006). When TEWL occurs and the corneocytes shrink, this creates cracks that permit irritants and allergens to enter the skin, which then creates an inflammatory response (Cork & Danby, 2009). Fragrances are known sensitizers with as much as 14% of the AD population, affected by them (De Groot, 2000).

Participants of the study were asked to change to a “free and clear” detergent for the entire household. In addition, recommendations were to eliminate the use of perfumes and products containing fragrances or lanolin, both which have been shown to be sensitizers. 8 out of 10 participants agreed to follow the fragrance-free/sensitive skin treatment plan and change to a free and clear laundry detergent for the entire household. 2 participants were already implementing a free and clear laundry detergent. 1 participant mentioned that she missed using her scented laundry detergent but after some discussion agreed that it was worth the switch. All 10 participants indicated that they would continue to use a free and clear detergent as it appeared to be a positive change for the patient.

Open, compromised, areas of the skin can create opportunities for excessive exacerbation caused by irritants and chemicals. Removing known irritants and chemicals from products used with AD patients, further enhances the chances of treatment success.

Because AD is a chronic disease, it is important to understand that there are underlying SC deficiencies even if inflammation is not present. Therefore, using all of the above recommendations consistently is a part of a long-term maintenance regimen that is vitally important for the control of AD.

Recommendations for Additional Research

There are a plethora of opportunities for additional research for pediatric AD patients. A long term study designed like this one would be useful to see if the effects of parental stress on AD children was lasting. The results of such a study could provide insight into the benefits of nurse-provided comprehensive education. Nurses' efforts to provide comprehensive education would benefit from research that measured the effects of stress-reducing, fun application methods of applying products designed to reduce the symptoms of AD. Additionally, it would be interesting to see a side-by-side comparison study done on regular scented laundry detergent versus a free and clear detergent when all other elements of treatment are the same. For instance, if all patients are using the same pediatric dermatologist treatment plan with the only change in each group being the detergent type, how would this effect their AD?

Other areas of desired research are: (1) research for biomarkers that can assist with earlier diagnosis and possible prevention of the disease; (2) further research looking into the effects of topical antibiotics in the treatment of *S. aureus* in AD as opposed to oral antibiotics; (3) more research regarding the use of sodium hypochlorite without any

additional adjunctive therapy; (4) studies to further investigate milk sensitivities and their role in AD exacerbation; (5) research showing any possible link to children with acid reflux and atopic dermatitis; (6) research showing the effectiveness of changing shampoo and conditioner in atopic dermatitis on the eye lids (eyelid dermatitis); (7) research looking at formaldehyde and its role in AD exacerbation; (8) continued and more sound research regarding the use of probiotics and their role in AD; (9) research showing effective ways to initiate self-application and proactive treatment in older children with AD; and (10) studies showing pediatricians and their role in educating AD patients.

The long-term physical and emotional effects of this chronic condition are far reaching and the general practice communities have a reputation of removing and dismissing these implications. There is a consensus in the literature, among dermatologists, and researchers that available funding and research for AD is under-resourced compared to other chronic diseases and even within atopic conditions, especially within the United States (Hanifin & Reed, 2007).

Relevance to the Nursing Profession

A rise in the prevalence of AD indicates a need for an increase in patient and family education. In primary care, longer consultations have been associated with better patient outcomes and more satisfaction (Freeman et al., 2002). A study by Anderson, Camacho, and Balkrishnan (2007), overwhelmingly concluded that time spent with the physician is a stronger predictor of patient satisfaction and outcomes, than is the time spent in the waiting room. However, according to a self-reported physician survey, as of 2015, three percent of U.S. family physicians state that they spent less than nine minutes with each of their patients ("Statista," 2015). Physicians face tremendous time constraints

within today's clinical practice environments and this encroaches on the time they are able to provide for each patient throughout the day. Since physician-led treatment is measured by productivity, efficiency, and cost-reduction, this leaves little room for the patient-centered approach and care for the holistic being. The degradation of the patient-centered approach must be recognized by nursing professionals who are willing to spend some time with patients providing education that could enhance patient outcomes and fill physician gaps.

Frank (1991) differentiated care from treatment. Treatment is the technical routine that could ultimately be performed by a robot but care is communicated by the words and actions of an understanding and empathic human being. Care is the very act upon which the nursing profession was established and has the potential to reignite the patient-centered approach for AD patients. Research, such as this study, must first be utilized to show that as nursing professionals, nurses are teachers who care. With a proactive approach to education, we are in effect teaching the patient that the disease no longer controls them, but rather they are in control of their disease. Evoking a sense of control for either the caregiver or the patient can be the psychosocial trigger that promotes long-term treatment adherence. Nurses must not become disillusioned by the lack of care within our environments and begin to replicate the process seen within many clinical settings, but rather understand that providing education can: (1) increase the parents' confidence in dealing with a diagnosis of AD; (2) lower the parents' overall stress level; (3) lower the child's overall stress level; and (4) and increase the child's comfort level.

Nursing education typically employs a patient-centered approach that addresses the needs of the patient and caregiver at an appropriately assessed level for optimal

comprehension. The application of a theoretical framework is a staple of effective nursing practice. In fact, the greater the knowledge of theoretical basis of patient education, the more tools the nurse is equipped with to provide comprehensive and effective education. Patient education is not simply a lecture given before discharge, but rather a means by which we can apply an evidence-based theory, assist the patient in recognition of a problem, expand their ability to manage the problem, and potentially create positive, long-term, changes for better health.

The Transtheoretical Model of Change provided a successful evidence-based foundation for the education of AD patients and their caregivers. This model effectively allowed the recognition of human nature throughout treatment. Regression is a recognized and common occurrence when dealing with patient compliance. When a nurse allows human nature to intentionally play into their intent to educate, it proves to be less frustrating for those involved, as regression is allowed and many times expected as each stage of progression is reached.

A vital aspect to the quality of care for AD patients is comprehensive information on the complexity of the disease, and the potential cascade of problems that can occur with a lack of education. Health care providers are unable to provide this information in its entirety without collaboration amongst all health care professionals regarding the seriousness of this chronic condition. In addition, this information must not solely focus on the physical aspects of AD, but must also address the psychosocial components. Nurses further provide an appropriate balance of the social context and burden of this illness that affects the entire family unit. Nurses should empower caregivers and children with clear and consistent advice, written information, and demonstrations where

applicable. Visual demonstrations and videos can be used in an effort to make treatment time more enjoyable by taking a fun approach with product application. According to Carr (2009), a good liaison between primary and secondary care should not be overlooked as it provides a more seamless patient pathway and decreases the burden of care. The emphasis of effective, comprehensive, evidence-based, patient-centered education given by nursing professionals cannot be overstated in its regard to the importance of AD patients, caregivers, and their quality of life.

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Appendix A

Dermatology Clinic Permission



DERMATOLOGY GROUP
OF ARKANSAS, P.A.
Medical Towers I, Suite 690
9601 Baptist Health Drive
Little Rock, AR 72205

Tel 501-227-8422
Fax 501-227-7637
Toll Free 800-225-8422

Dermatology
Rene E. Bressinck, M.D.
Ray K. Parker, M.D.
Daniel F. Smith, M.D.
Francine Bruyneel, M.D.
Hayden H. Franks, M.D.
Lindsay L. Enns, M.D.

Dermatopathology
J. Ahmad Brown, M.D.

I, Lindsay Enns, understand that Lindsey Bryant is conducting research about nurse-led care pertaining to Atopic Dermatitis excluding prescriptive medications. I support her in this endeavor and I understand she will be recruiting patients from my practice and I support her in this recruitment effort.

Physicians Signature

Lindsay Enns

Date

7/20/15

Benton
#5 Medical Park Drive
Suite 304
Benton, AR 72015
501-776-3800

Pine Bluff
1416 West 43rd Avenue
Pine Bluff, AR 72603
870-535-7477

Clinton
Ozark Health Specialty Clinic
2526 Hwy 65 South, Suite 205
Clinton, AR 72031
501-745-9439

Appendix B

Consent

Dear Parent or Guardian,

I am presently involved in a research study about understanding what effect nurse-led education regarding daily lifestyle modification and patient education has on the management of pediatric atopic dermatitis. Information on this topic is valuable for understanding what nurses can do/change to create a positive effect and potentially decrease exacerbations for pediatric patients.

I would like permission for you and your child to participate in a private Facebook support group and research study. The support group will allow myself, a Registered Nurse, to provide information regarding daily lifestyle modifications. You have been asked to participate in this study because your child currently has diagnosis of Atopic Dermatitis (Eczema). These modifications are non-invasive, non-prescriptive, contain no medications and might include: over-the-counter lotions or soaps currently recommended by a pediatric dermatologist, changes in shampoo, product application tips, conversations, and support regarding the parental frustrations that come with treating this skin condition. If the parent determines they would like to participate and make a product change, they are solely responsible for the purchase of any new products. No reimbursements will be given and there is no monetary benefit provided for participating in this research study. All the information given to the parent will be for their own

personal home use if they so choose. The Registered Nurse will not be providing treatment or coming into contact with the child at any time.

This research will be a six week study that starts October 26, 2015 and ends December 7, 2015. There will be a three week follow-up telephone call with a questionnaire to check on the status of the child. At the conclusion of my research, an additional questionnaire will be presented to the Parent or Guardian of the child via telephone. For each questionnaire, there will be six questions for you to answer that will determine what effect the exchanged information had on you and your child at the three and six week marks. If you and your child find this research study to be helpful some benefits might include, an increase in confidence, an increase in parental competence, a decrease in both child and parental stress level, and an increase in the child's comfort level.

You and your child's participation in this research is completely voluntary, and you may withdraw from participation at any time. There is no penalty to you or your child if you chose not to participate or to withdraw from the study. As a Registered Nurse, I cannot diagnose or medically treat your child. My advice will be within my scope of practice and will always refer you to seek medical advice from your pediatrician or dermatologist if you need further help or if determine that your child's condition worsens. If a participant continues to make requests outside of my scope of practice, they will be terminated from the research study.

There are no foreseeable risks or discomforts as this research is no more than minimal risk. The support group on Facebook will be a private group for only consenting participants in the study, it is password protected, and that password will be changed

every month to maintain confidentiality. In addition, no reference will be made in oral or written reports that could link you or your child's identity to the study. Please understand that the use of this information will be primarily for my research conducted through West Texas A&M University graduate program. If any new significant findings develop during the course of the research, it will be provided to the participants.

I appreciate your participation in this research. If you have any questions about the study, please feel free to contact this investigator or my faculty advisor/department head, Lisa Davis, at [REDACTED] or [REDACTED].

Sincerely,

Lindsey Bryant, BSN, RN
Primary Investigator, West Texas A&M University

[REDACTED]

[REDACTED]

I _____ (print parent name), agree to all of the above and would like to participate in this research study.

Parent or Guardian's Signature:

Date:

I _____ (print child's name), assent to participate in this study.

Child's signature or Verbal Assent:

Date:

Appendix C

Pediatric Atopic Dermatitis Research Study Three Week Questionnaire

Please answer the following six questions as they relate to the nurse-led education you have received so far, during this research study regarding daily lifestyle modifications for pediatric atopic dermatitis patients.

1. Are you as a parent finding the information given to you at the beginning of this study to be helpful?

yes no

2. Do you as a parent feel that the information is beginning to increase your confidence in dealing with the struggles that come with pediatric atopic dermatitis?

yes no

3. Do you as a parent feel this information has lowered your overall stress level in the last three weeks?

yes no

4. Do you as a parent feel this information lowered your child's overall stress level in the last three weeks?

yes no

5. Do you as a parent feel like the implementation of this information has increased your child's comfort level in the last three weeks?

yes no

6. Do you as a parent feel like nurse-led education regarding daily lifestyle modifications has had a positive effect on both you and your child in the last three weeks?

yes no

** If the answer to question 5 is “no,” the parent will be asked to expound upon the child’s current status in regard to their Atopic Dermatitis to determine if the child’s condition is worsening and warrants removal from the study for medical treatment.

Appendix D

Pediatric Atopic Dermatitis Research Study Final Questionnaire

Please answer the following six questions as they relate to the nurse-led education you have received during this research study regarding daily lifestyle modifications for pediatric atopic dermatitis patients.

1. Did you as a parent find the information received during the course of this research study to be helpful?

yes no

2. Did you as a parent feel that the information increased your confidence in dealing with the struggles that come with pediatric atopic dermatitis?

yes no

3. Do you as a parent feel this information lowered your overall stress level?

yes no

4. Do you as a parent feel this information lowered your child's overall stress level?

yes no

5. Do you as a parent feel like the implementation of this information has increased your child's comfort level?

yes no

6. Do you as a parent feel like nurse-led education regarding daily lifestyle modifications has had a positive effect on both you and your child?

yes no

** If the answer to question 5 is “no,” the parent will be asked to expound upon the child’s current status in regard to their Atopic Dermatitis to determine if the child’s condition is worsening warrants the need for medical treatment.

Appendix E

Institutional Review Board Approval

October 30, 2015

Dear Lindsey Bryant:

Your research proposal titled, "**The Effect of Nurse-led Education Regarding Daily Lifestyle Modification and Patient Education on Management of Pediatric Atopic Dermatitis**" was submitted to the full membership of the West Texas A&M University IRB on **September 29, 2015** for an **expedited** review. The IRB may (i) approve, (ii) approve conditionally, or (iii) disapprove proposed protocols and consent forms. The decision of the IRB regarding your proposal was:

<input checked="" type="checkbox"/>	Approve
<input type="checkbox"/>	Approve Conditionally
<input type="checkbox"/>	Disapprove

The initial decision of the IRB regarding your proposal was to approve conditionally. The requested changes/clarifications you provided to the committee were satisfactory and moved your status from conditional approval to full approval. Congratulations!

Approval is extended for one calendar year. Should data collection proceed past one year, or should you make changes in the methodology as it affects human subjects, you must resubmit the study to the IRB.

Assuming all IRB training requirements have been met, procedures involving human subjects may now proceed.

Upon verifying your successful completion of all training requirements, an official letter of approval from the Graduate School is forthcoming. Thank you for your cooperation with the IRB and we wish you well in your research project.

Sincerely,

Dr. Gary Bigham, IRB Chair