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Managing Childhood Atopic Dermatitis: Utilizing a Written Eczema Action Plan to Improve

Caregiver Self-Efficacy

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MANAGING CHILDHOOD ATOPIC DERMATITIS

Abstract

Approximately 13% of the pediatric population suffer from atopic dermatitis (AD) or eczema (Silverberg & Simpson, 2014). Eczema is a complex and costly managed disease. There is a need to improve caregiver knowledge and to maintain and control exacerbations as national prevalence increases in the United States. Literature supports utilization of a written Eczema Action Plan (EAP) to improve caregiver self-efficacy of eczema management. An evidence-based practice project was conducted in a primary care pediatric practice implementing a written EAP for mild to severely diagnosed patients ranging from 4 months to 17 years of age. The practice intervention included providing each caregiver with an individualized written EAP developed by the American Academy of Dermatology (AAD), an eczema patient education handout by The Society for Pediatric Dermatology, and a list of over-the-counter products endorsed by the National Eczema Association. Thirty caregivers were recruited for this pilot and 22 participants completed the project. The validated Patient Oriented Eczema Measurement for children (POEM) and the Parental Self-Efficacy Care Index (PASECI) tools were completed by caregivers pre-intervention and again between 6- and 8-weeks post-intervention. Eczema severity decreased by approximately 65% and caregiver self-efficacy increased with an average score of 8.11/10 utilizing the PASECI. A written EAP is easily adaptable in the primary care setting closing communication barriers between caregiver and provider. Utilization of a written EAP establishes best care practice congruent with the American Academy of Pediatrics (AAP) clinical guidelines. Potential benefits include reduction in follow-up visits, treatment costs, improvement in referral identification, and increased caregiver and patient satisfaction.

Keywords: eczema action plan, childhood eczema, caregiver self-efficacy, POEM, PASECI

Background and Evidence for Clinical Problem

Eczema primarily affects children. Eighty-five percent of children diagnosed with eczema have an onset of the disease before 5 years of age (Tollefson, Bruckner, & Dermatology, 2014). The condition can range in severity from mild to severe forms causing pruritus, pain, and an increased risk for infections. Managing eczema is a challenge for parents because skincare is complex and must include specific treatment for flare-ups and long-term maintenance (Shi, Shivani, Lee, Armstrong, & Lio, 2013). Lack of adherence to complex treatment regimens is a common cause of treatment failure in many long-term conditions in children including eczema, asthma and diabetes (Waldecker, Malpass, King, & Ridd, 2013). Ineffective management of childhood eczema stems from lack of parental knowledge and self-efficacy regarding the condition, skincare maintenance, and treatment of acute exacerbations. For the care in management of AD for children, the AAD insists the use of written action plans as an educational intervention to reinforce parental education and improve AD severity (Sidbury, Bergman, Copper, Silverman, & Berger, 2014).

Eczema can negatively affect the quality of life for patients and their family physically and emotionally. An informal systematic review found itching and scratching affected the quality of life in children the most in addition to lack of sleep, pain, and restrictions in physical and social activities. Family members were affected by symptoms of itching and scratching due to lack of sleep and feelings of helpless emotions seeing their children suffer. A systematic review concluded that when AD severity increases, quality of life decreases as well. Studies revealed generalized eczema is responsible for the second greatest impact affecting quality of life following cerebral palsy (Drucker et al., 2017). The impact of eczema on quality of life of the

MANAGING CHILDHOOD ATOPIC DERMATITIS

family is not limited to the United States. In broader spectrum, the results of a current cross-sectional study of 110 children in Malaysia shows AD negatively affects the quality of life for patients as well as their family members evidenced by the Dermatitis Family Impact score (Ghani, Noor, Muhamad, & Ismail, 2013).

Childhood Eczema in the United States and California

The prevalence of childhood eczema is increasing in the United States. A most recent study analyzed data from the 2007 National Survey of Children's Health. A national sample of 92,642 children ages 0 to 17 years revealed 12.9% had been diagnosed with childhood eczema (Silverberg & Simpson, 2014) as opposed to 10.7% in a previous study conducted 3 years prior (Shaw, Currie, Koudelka, & Simpson, 2011). This increase indicates a need for quality improvement in the management of eczema by primary care providers and caregivers. Of the 12.9% of diagnosed patients, 67% had mild disease, 26% have moderate disease, and 7% have a severe form of eczema (Silverberg & Simpson, 2014). Furthermore, the rate of severe childhood eczema in the state of California is 5.9% (Silverberg & Simpson, 2014).

Expenditures for AD add to the burden for families. The average cost to manage AD one month prior to seeing a provider is \$274 in the United States (Filanovsky et al., 2016). The national estimated annual costs to manage eczema is \$5.297 billion dollars (Drucker et al., 2017). Improved management of mild to moderate eczema in pediatric primary care can potentially prevent disease progression and improve long-term outcomes.

Childhood Eczema Management in a Pediatric Primary Care Clinic

Eczema is commonly treated by providers in pediatric primary care with topical emollients and corticosteroids. In some cases, the condition is poorly managed by caregivers and the severity of eczema worsens causing physical discomfort and emotional stress to the child and

MANAGING CHILDHOOD ATOPIC DERMATITIS

family. Successful management of this condition requires parents to have a knowledge of eczema, triggers, a prescribed skincare regimen, and how to manage flare-ups. Common practice to educate parents primarily includes verbal instruction without the use of a written plan. Verbal instructions can be vague leaving parents feeling inadequate to care for their child's eczema. The AAP supports the use of an EAP to provide comprehensive education for parents managing the symptoms of childhood eczema. Although clinical guidelines have been published by the AAP to implement EAPs, variability exists in clinical practices (Tollefson & Bruckner, 2014).

Gaps in parental education have led to different expected outcomes between parents and providers. A qualitative study at the University of Bristol determined the challenges of managing eczema included a lack of support and information provided to parents resulting in differing views about its causes and management. Some parents were looking for a cure due to a root cause such as an allergy. Primary care providers viewed eczema as a chronic condition recommending emollients to prevent exacerbations (Powell, Roux, Banks, & Ridd, 2018). Additionally, another qualitative study demonstrated many families were unaware of the reason behind why emollients were even suggested (Santer et al., 2013).

Poorly managed eczema was reported by the physician and observed by the Doctor of Nursing (DNP) candidate at the clinical site of this pilot study. Due to a lack of an electronic medical records (EMR) system, it was difficult to track the prevalence of eczema in the practice. The DNP candidate blindly reviewed 100 paper health records to determine the prevalence of eczema in the practice. Forty-one percent had documentation of an eczema diagnosis during various time periods of care indicating a strong need for caregiver intervention.

Proposed Evidence-Based Solutions

A literary search was conducted using PubMed, CINAHL Plus, Health and Psychosocial Instruments, and Google Scholar. Key words included eczema action plan, pediatric atopic dermatitis, self-management of eczema, parental education, parental self-efficacy, and eczema severity index. The search yielded 3592 articles and was narrowed to 32 pertinent articles mostly published less than 5 years ago. Of the 32 articles reviewed, 26 articles were used in this final pilot project.

The utilization of a written EAP in conjunction with verbal instruction increases parental confidence level when managing daily skincare of mild to severe symptoms of eczema. A recent randomized controlled trial included parents of 88 children diagnosed with AD ranging in age from 1 month to 12 years found the use of an EAP over a span of 3 months demonstrated significant improvement in parental confidence through quality of life measures. Improvement was demonstrated in domains that included, “I feel certain about what to do when my child’s skin is getting worse,” ($P=.003$), “know names of creams to use on my child’s skin,” ($P=.016$), and “feel helpless about my child’s skin condition,” ($P=.034$) (Gilliam, Madden, Sendowski, Mioduszewski, & Duderstadt, 2016).

Another randomized controlled trial included a combination of 37 AD patients and caregivers of children less than 18 years of age showing how an EAP combined with verbal instruction significantly improved multiple areas of eczema management. Some of the domains demonstrating improvement included daily treatment plan ($P<.01$), adjust treatment based on AD severity ($P<.001$), remission recognition ($P<.001$), and comfort with treatment plan ($P<.01$) (Shi et al., 2013). Recent evidence validated EAPs are useful and can be applied to primary care practice.

MANAGING CHILDHOOD ATOPIC DERMATITIS

The AAP provided a sample EAP for the management of AD within their most recent atopic dermatitis guidelines (Tollefson et al., 2014). It includes a step-by-step process of daily skincare maintenance, application of anti-inflammatory medications, itch control, and recognition of exacerbations. There are currently no guidelines that standardizes EAP format or content. The International Consensus Conference on AD II (ICCAD II) suggested EAPs follow specific criteria that includes written instructions remain with the patient, has a step-wise treatment approach based on severity of symptoms, and content should be validated by patients and caregivers (Sauder, McEvoy, & Ramien, 2016).

Use of a 3-step EAP format was preferred by parents and may increase confidence in the knowledge of skincare management according to a qualitative study from the University of Bristol. Forty-one participants including healthcare professionals from multiple disciplines, parents, and stakeholders provided input to create an eczema written action plan (EWAP) for children. They designed an EWAP based on clear instructions presented in a step-by-step process with color and pictures to engage children and aid in communication and comprehension for parents. Generalized information about eczema including the condition itself, triggers, tips for moisturizing, flare-up recognition, and additional links to resources was included in the final EWAP design at the request of the participants (Powell et al., 2018). The EWAP format and content closely mimics criteria set forth by the ICCAD II, however it has not been validated in clinical practice.

Establishing a clear understanding of eczema helps parents and providers share the same treatment goals. In the University of Bristol study, general practitioners identified conflicting treatment goals between providers and parents as a barrier to successfully treating and managing eczema. The participants of the study, including parents and general practitioners, preferred

MANAGING CHILDHOOD ATOPIC DERMATITIS

receiving and distributing general eczema information including the rationale for using emollients (Powell et al., 2018). In addition, previous research showed when practitioners established a strong relationship with parents by providing a clear explanation of eczema, adherence to treatment was more likely (Santer et al., 2013). It is important to provide parents with generalized eczema information to create a better understanding of the condition, the course of treatment, and provider expectations.

Providers who take time to explain treatment plans to parents increase parental comprehension of skin management. In order to close the communication gap between providers and caregivers of pediatric patients, practitioners need to be willing to take the time to explain treatment plans. This includes highlighting the disease process and explaining proper medication administration. Written EAPs should be explained carefully in order to engage caregivers in various aspects of skincare management. This principle of shared decision making can result in improved long-term outcomes (Levy, 2013).

There is currently no standardized written action plan design that has been clinically tested for effectiveness with the exception of a few studies where EAPs were independently created. Currently a multi-disciplinary group from the Children's Hospital of Eastern Ontario in Ottawa, Canada are in the process of developing and clinically testing a written action plan (Innes-Leroux, 2016). Currently no validated action plan has been disseminated. The AAD and The Society for Pediatric Dermatology created a pediatric EAP and a patient education handout of general eczema information respectively ("How will I know what to do to control the eczema?," 2018; "Patient Handouts," 2018.). These resources are available for public use without cost. The formats are congruent with that of the EWAP and the ICCAD II criteria and therefore were utilized in this pilot study.

Description of EBP Project

This pilot project was conducted in a private pediatric clinic with one physician, the DNP candidate, three nursing assistants, and an office manager. Patients diagnosed with eczema were identified by the physician and DNP candidate during well-check and ill visits. Caregiver participation was voluntary. Prior to implementation, parents completed a demographics questionnaire (see Appendix A), the validated POEM (see Appendix B) designed for children to rate eczema severity, and the validated PASECI (see Appendix C) to measure caregiver self-confidence (Charman, Venn, & Williams, 2004; Ersser et al., 2015). The DNP candidate then implemented an individualized written EAP designed by the AAD and individualized it to each patient based on the physician's orders (see Appendix D). In addition, caregivers received an eczema patient education handout published by the Pediatric Society of Dermatology (see Appendix E) and a list of National Eczema Association approved over-the-counter products including moisturizers and cleansers (see Appendix F). Caregiver comprehension of the EAP was measured immediately post intervention using a Likert-like survey question (see Appendix G).

The POEM and PASECI questionnaire were completed again between 6- and 9-weeks post EAP intervention via Google Forms. The average response time was 7.14 weeks. A \$20 gift card incentive was offered to each participant for completion of the questionnaires after a 6-week timeframe (see Appendix H). A systematic review concluded the use of moisturizers in patients who had mild to moderate eczema effectively treated eczema within a 6 week to 6 month timeframe justifying the follow-up time for this pilot project (Becker & Rensberry, 2018).

Documentation of EAP implementation and the date of issue to caregivers was completed in each patient record by the DNP candidate. The EAP will remain an important part of the

patients' course of eczema care and management. The primary care provider will be able to obtain an understanding of caregiver eczema health literacy and guide the decision-making process to modify the EAP or conduct a referral to dermatology in the event eczema is not controlled in the future.

Measurements

The POEM designed for children was utilized to obtain the extent of eczema severity as reported by the caregiver of the child. The POEM consists of seven questions of equal weight. All seven questions ask the caregiver to describe how often eczema symptoms are experienced from zero days to every day. POEM scores were calculated by adding up points for all seven questions. Each question was worth zero to four points dependent on how often symptoms presented within the last week for a maximum score of 28. The outcome of the total score helped patients and clinicians identify the severity of eczema from clear or almost clear to very severe eczema. The POEM is validated and suitable for use in outpatient clinic settings (Charman et al., 2004). It is copyrighted by the University of Nottingham and free for clinicians to use. The English version of the POEM was utilized in this project.

The POEM instrument has been utilized in current studies. In 2015, a randomized clinical trial compared the effectiveness of direct versus online access for eczema follow-up care for pediatric and adult patients. Additionally, it was used in this trial to assess disease severity. Results indicated direct and online access to care were equivalent in clinical outcomes (Armstrong et al., 2015). In 2017, a randomized control trial used the POEM and demonstrated children in ambulatory care with mild eczema did not clinically benefit from oral and topical antibiotics in addition to topical emollients and corticosteroids (Francis et al., 2017).

MANAGING CHILDHOOD ATOPIC DERMATITIS

The PASECI was utilized to examine caregiver self-efficacy in eczema management. It is validated and reliable with high consistency in all domains (Cronbach's $\alpha > 0.87$) (Ersser et al., 2015). The instrument is organized into four sections. Sections include parental confidence measurements in managing medication, managing symptoms, communicating with health care professionals, and managing personal challenges. There are 29 total questions and confidence levels are measured using a Likert-like scale from 0 (cannot do at all) to 10 (highly certain can do). For the purposes of this project, only caregiver ability to manage eczema and symptoms were examined. The seven parental self-efficacy category measurements included caregiver ability to apply moisturizers, chose appropriate moisturizers, avoid triggers, chose appropriate medication, manage symptoms, recognize infection and properly use topical steroids. Currently, only an English and Korean version of the PASECI have been validated (Lee, Son, Kim, Han, & Noh, 2016). The PASECI instrument has not been found in recent eczema management studies.

Anticipated Project Outcomes

Three short-term goals were established for this project. The first goal was to obtain parent comprehension of the implemented EAP with a reported average score of 8 of 10 using a Likert-like survey question. A score of 0 equated to no understanding and score of 10 equated to full understanding. Parental comprehension was rated immediately after the implementation of the EAP to ensure successful parental education. The second goal was for parents to report reduced eczema severity post intervention by an average of 5 points utilizing the validated POEM tool. The POEM tool was completed by parents at the initial encounter and again at 6 weeks. The third goal was for parents to score an average of 8 of 10 for self-efficacy using the PASECI post EAP intervention. Similarly, this tool was completed by parents at the initial encounter and again at 6 weeks.

Anticipated Project Impact

The overall goal of this pilot project was to provide important instruction and education to parents of children with AD in hopes to reduce eczema severity. The EAP and general information about eczema are important tools to help parents efficiently and confidently manage their child's skincare with this regressive condition. Managing eczema can be complicated. Increasing communication between the provider and parent may promote better outcomes for treatment, adherence of treatment regimens and improve quality of life for children who are affected by eczema. The results of this project may have a potential impact on future research and projects allowing an evidence-based intervention such as the written EAP to become standardized nationally and worldwide.

PICOT Question

P: In a primary care clinic, pediatric patients ages 4 months to 17 years of age diagnosed with mild to moderate atopic dermatitis also known as eczema

I: Provide parent/caregiver education using a written Eczema Action Plan (EAP) in addition to verbal teaching

C: Compared to standard verbal teaching of eczema management

O: Result in decreased severity of child eczema symptoms and increased parental self-efficacy

T: Within 6 weeks-10 weeks

EPB Model

The Iowa Model was selected as the evidence-based practice model for this pilot project. It is a constant challenge for nurses to provide the highest quality care that is measurable and evidence-based. If care is not evidence-based, a potential for patient harm may increase (Doody & Doody, 2011). The Iowa Model is an excellent framework to help engage the stakeholder and

MANAGING CHILDHOOD ATOPIC DERMATITIS

pilot the written EAP systematically, then evaluate and adjust intervention accordingly. The Iowa Model is knowledge focused as is the intervention and helped to individualize evidence-based practice into this clinical setting. Validity of evidence was variable. The Iowa Model served as guide in the introduction, development and evaluation of evidence-based practice. The model was used to evaluate if the EAP was appropriate for adoption by analysis of its structure, process, and outcome data in order to deliver the best clinical care. Results will be disseminated and if sustainable, the Iowa Model can continuously guide a written EAP into multidisciplinary healthcare settings.

Project Process Plan

A letter of support was obtained by the sole provider of the practice approving use of collected data and dissemination on April 20, 2018 (see Appendix I). University of San Diego (USD) faculty approval was obtained April 24, 2018 (see Appendix J). The USD Institutional Review Board approved an exempt status on April 27, 2018 (see Appendix K). Data collection began on April 20, 2018 and the EAP was implemented by the DNP candidate. A total of 30 voluntary participants were enrolled in this pilot project. The DNP candidate sent out electronic copies of the written EAP via text to participants between 1-2 weeks post EAP implementation and offered to answer any questions caregivers had regarding the EAP. At about 6-7 weeks post intervention, participants were contacted via text message to complete the POEM and PASECI questionnaires. Of the 30 participants, 22 completed the post-intervention POEM and PASECI via Google Forms. Twenty-dollar gift cards to Walmart were mailed individually to participants who completed post intervention measurements. Eight participants were lost to follow-up for unknown reasons. Data collection concluded on August 1, 2018. Data analysis was conducted between August 1, 2018 to August 22, 2018.

Dissemination

A significant component of completing an evidence-based project is to share the results. The dissemination of project findings was presented to key stakeholders including the sole physician and the entire staff on January 30, 2019. A successful poster presentation was conducted at the clinical site. The poster included background, evidence for the clinical problem, purpose of the project, project plan, results of data analysis, conclusions, and implications for clinical practice.

A second presentation took place on campus at the USD Project Presentation Day on February 28, 2019. A PowerPoint presentation was created to present the pilot project and its findings to fellow students and faculty at the Hahn School of Nursing. An exchange of questions and answers prompted interest and ideas of clinical implications and inspiration to upcoming and experienced practitioners.

A third presentation took place at a national health conference in the form of a poster presentation. This project was selected by The California Association for Nurse Practitioners 42nd Annual Educational Conference that took place March 14-17, 2019 in San Diego, California. The results of this pilot project were shared on a broader statewide and national level to healthcare providers who showed interest in integrating EAPs into their clinical practice.

Sustainability

It is important to consider how use of a written EAP will remain sustainable in this clinical practice. The dissemination of results may motivate the provider and staff to continue utilization in order to provide best practice and positive long-term outcomes for patients and their families. The physician and the clinic nurse could become champions to continue implementation. Copies of written EAPs can be stored near other patient education handouts for

visibility and accessibility. This practice is implementing an electronic medical record system in the near future. An electronic prompt could be created as a reminder for the physician to use EAPs as an important tool to manage eczema.

Additionally, satisfaction surveys could be distributed among participants of this study one year later that may reveal a higher patient satisfaction. A good rapport was established between the physician and the DNP candidate throughout this project. It is possible the DNP student continue and encourage sustainability with the practice every 6 months for the first-year post EBP project via casual face-to-face discussion or by text messaging to find out if any challenges arise with the EAP and provide suggestions for improvement. All these elements combined will help successfully sustain the EAP long-term greater than 12 months.

Results

Caregivers reported a 9.8 comprehension level immediately following receipt of the EAP. Analysis of the data revealed improvement in eczema severity and caregiver self-efficacy. Eczema severity decreased from an average of 7.33 POEM points (mild to moderate severity) to an average of 2.55 points (clear to mild severity) post-intervention (see Figures 1 and 2). Forty-five and a half percent of the sample had no change in severity, 55% showed decreased change, and 4.5% had an increase in severity (see Figure 3).

Caregiver self-efficacy improved from an average of 5.51 PASECI points to an average of 8.11 points post-intervention (see Figure 4). There was improvement in 100% of seven measured PASECI categories. Post-intervention, caregivers reported most confidence increase in how well they were able to appropriately use steroids with a 33.3% improvement, how well they were able to recognize infection with a 32.9% improvement, and how well they were able to manage eczema symptoms with a 27.5% improvement (see Figure 5). There was a significant

MANAGING CHILDHOOD ATOPIC DERMATITIS

correlation between the pre and post PASECI scores; 19.36% of a change in the post PASECI could be explained by the pre PASECI score ($r = .441$, $p = .040$), however statistical significance was underpowered by the sample size.

Ninety percent of caregivers reported they had never utilized an EAP prior to this project. The majority of caregivers were 64% mothers and 27% fathers between the ages of 26 to 35 years of age. The primary languages reported were 44% English, 27% Vietnamese, and 60% percent of caregivers worked full-time. Eighty percent of children were 5 years of age and younger with an equal distribution of male and females. Fifty-three percent children were reported Hispanic and 23% were Asian. Thirty-three percent had a family history of seasonal allergies, and 20% had a family history of asthma. Forty percent had been diagnosed with eczema less than six months while 40% had been diagnosed for greater than a year. Refer to Tables 1-10 for a more detailed description of the project demographics.

Implications for Clinical Practice

The results of this pilot project support the beneficial use of written EAPs in primary care as presented by previous evidence. Formatted and individualized EAPs are comprehensible and improve caregiver confidence and self-efficacy resulting in decreased severity of childhood eczema symptoms. Demographic analysis and limitations of this project prove availability of translated EAPs and educational handouts may have increased impact if offered in a caregiver's primary language. As caregiver confidence levels increase, they feel more equipped to manage and care for childhood atopic dermatitis. Lifelong maintenance including proper use of medications and avoidance of environmental triggers requires a standard approach clinicians can easily utilize in practice. Dissemination of this small project may influence future evidence-based projects and research of a larger scale in order to produce potential statistically significant

MANAGING CHILDHOOD ATOPIC DERMATITIS

data and validation of a written EAP. Future studies and projects may expand EAP utilization beyond pediatric primary care to other clinical or non-clinical environments. Moreover, family quality of life could be evaluated as well as long-term physiologic and psychologic outcomes of eczema patients. Further research and evidence may substantiate the use of a written EAP standardizing design and method to better equip caregivers in the lifelong maintenance and control of childhood atopic dermatitis.

Cost-benefit Analysis

Utilization of a written EAP in primary care is cost-effective. A financial key benefit resulting from this project was treatment cost savings for families. The total costs for this project was approximately \$620 including \$40 of purchased materials, \$440 of participant incentives, and \$140 for paper copies to create an EAP packet for each parent. The average out of pocket expenses is approximately \$274 per month for families who seek multiple over the counter treatments before seeing a provider (Filanovsky et al., 2016). For patients who are not typically covered by health insurance, effective treatments include moisturizers and prescribed steroid creams. This cost is approximately \$100 per month (“How Much Does Eczema Treatment Cost?,” 2018). Each patient would be able to save about \$174 per month with correct and effective treatment as directed by use of the EAP. For this project of 30 initial participants, $\$174 \times 30 \text{ patients} = \5220 eczema treatment costs per month. Potential patient cost avoidance benefit was approximately \$8.42 for every \$1.00 spent on this project. This was approximately a 742% return on investment with use of an EAP in comparison to no EAP.

Non-financial key benefits from this project included congruence of AAP clinical guidelines and best evidence-based clinical practice. A reduction in eczema severity may potentially decrease the risk for infection, emergency department visits, and hospital admissions.

MANAGING CHILDHOOD ATOPIC DERMATITIS

Additionally, the practice may benefit from EAP implementation with an increase in service availability for higher acuity conditions. If eczema severity is unchanged or worsens, documented use of the EAP may help the provider improve identification for dermatology referrals. Furthermore, caregivers may recognize the quality of individualized medical services received for their child generating positivity and loyalty to the practice.

Limitations

This project included a recruitment of 30 voluntary participants, however due to constraints of the project, the potential quantity of contributors was limited due to different factors including language, small private practice, and timeline limitations. Of 30 participants, 22 completed the project. Inclusion requirements to participate in the project were ability to speak, read, and write in English. No translated versions of the EAP, patient education handouts, or instruments were offered. Data analysis showed English was the primary language for approximately 44% of the sample followed dominantly by Vietnamese and Spanish. Although many of the participants met inclusion criteria, some caregivers may have been unable to participate in follow-up assessments due to English language barriers. Time constraints of this project also contributed to the small size of the sample and was restricted due to academic time limitations. Although monetary incentive was offered to participants to complete the follow-up surveys, it is unclear if the reward was deemed valuable to them. Inability to use a smart phone to text and use Google Forms, change in contact information, forgetfulness, personal reason or choice to not participate in follow-up may have been additional factors explaining reasons for not completing the post survey.

Conclusion

Two of the three anticipated project outcomes were met. The caregiver EAP comprehension goal was met with 9.8 of 10. Eczema severity decreased by 4.78 out of 5 POEM points post intervention and indicates a successful outcome. The caregiver self-confidence goal was met with an average of 8.11 of 10. Atopic dermatitis affects an estimated 30% of the United States population with the majority including the pediatric population (“Eczema (Atopic Dermatitis) | NIH: National Institute of Allergy and Infectious Diseases,” 2018.). There is currently no standardized tools used to manage eczema in the pediatric primary care setting. Literature has proven comprehensive caregiver education through use of a written EAP decreased symptom severity and improved caregiver self-efficacy. Implementing EAPs in the primary pediatric care setting is a feasible practice which may successfully increase caregiver knowledge in managing eczema and reduce clinical symptoms.

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MANAGING CHILDHOOD ATOPIC DERMATITIS

Table 1

Caregiver Type

Type	Frequency	%
Mother	19	64%
Father	8	27%
Grandparent	1	3%
Sibling	1	3%
Aunt	1	3%

MANAGING CHILDHOOD ATOPIC DERMATITIS

Table 2

Age of Caregiver

Age in years	Frequency	%
18-25	2	7%
26-35	21	70%
36-45	4	13%
46-65	3	10%

Table 3

Primary Language of Caregiver

Primary language	Frequency	%
English	13	44%
Vietnamese	8	27%
Spanish	6	20%
Azari	1	3%
Lao	1	3%
Somali	1	3%

Table 4

Work Status of Caregivers

Work status	Frequency	%
Full-time	18	60%
Part-time	1	3%
Does not work	11	37%

MANAGING CHILDHOOD ATOPIC DERMATITIS

Table 5

Age of Children

Age	Frequency	%
<6 months	5	17%
≥6 months-24 months	10	33%
>2-5 years	9	30%
6-10 years	2	7%
11-15 years	3	10%
16-18 years	1	3%

Table 6

Child Gender

Sex of child	Percentage of sample
Male	50%
Female	50%

MANAGING CHILDHOOD ATOPIC DERMATITIS

Table 7

Race of Children

Race	Frequency	Approximate %
White	1	3%
Hispanic	16	53%
Asian	7	23%
Black	2	7%
Asian Hispanic	1	3%
White Hispanic	1	3%
Prefer not to answer	1	3%

MANAGING CHILDHOOD ATOPIC DERMATITIS

Table 8

Child Allergy, Medical History, Exposure

Type	Frequency	%
Seasonal allergy (family history)	10	33%
Food allergy (family history)	4	13%
Food allergy	4	13%
Asthma	2	7%
Asthma (family history)	6	20%
Smokers in the home	5	17%

MANAGING CHILDHOOD ATOPIC DERMATITIS

Table 9

Duration of Eczema Prior to EAP

Time	Frequency	%
<6 months	12	40%
6-12 months	6	20%
>12 months	12	40%

Table 10

History of Eczema Action Plan

Type	Frequency	%
History of using EAP	3	10%
No history of using EAP	27	90%

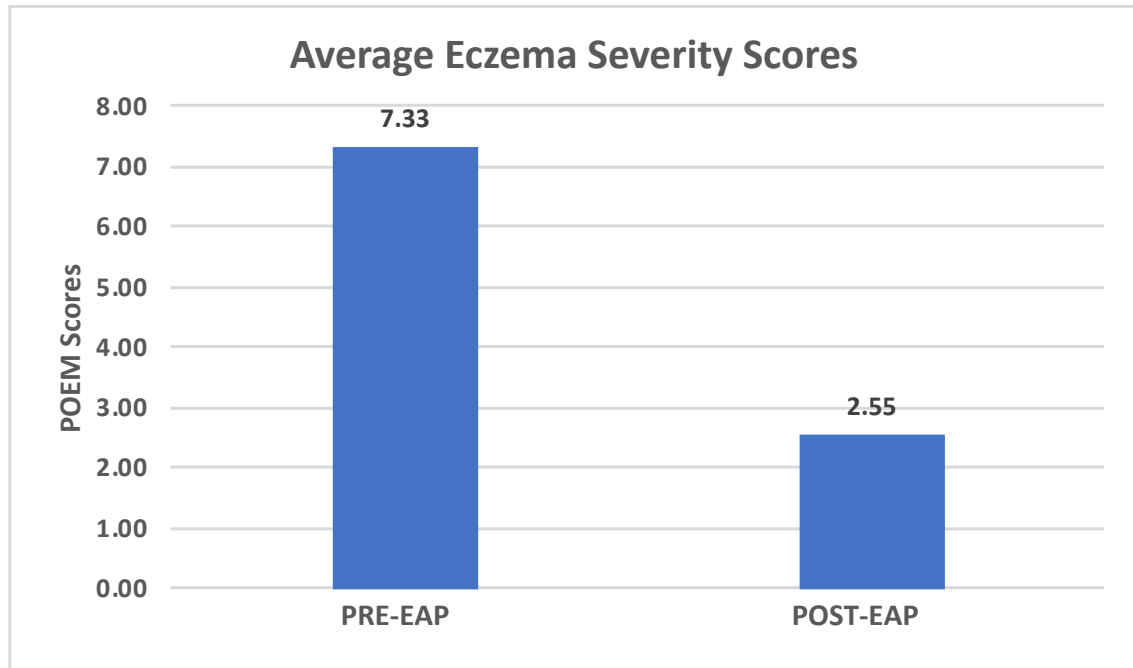


Figure 1: Eczema severity decreased by 4.78 average POEM points post EAP. This illustrates a reduction in eczema severity.

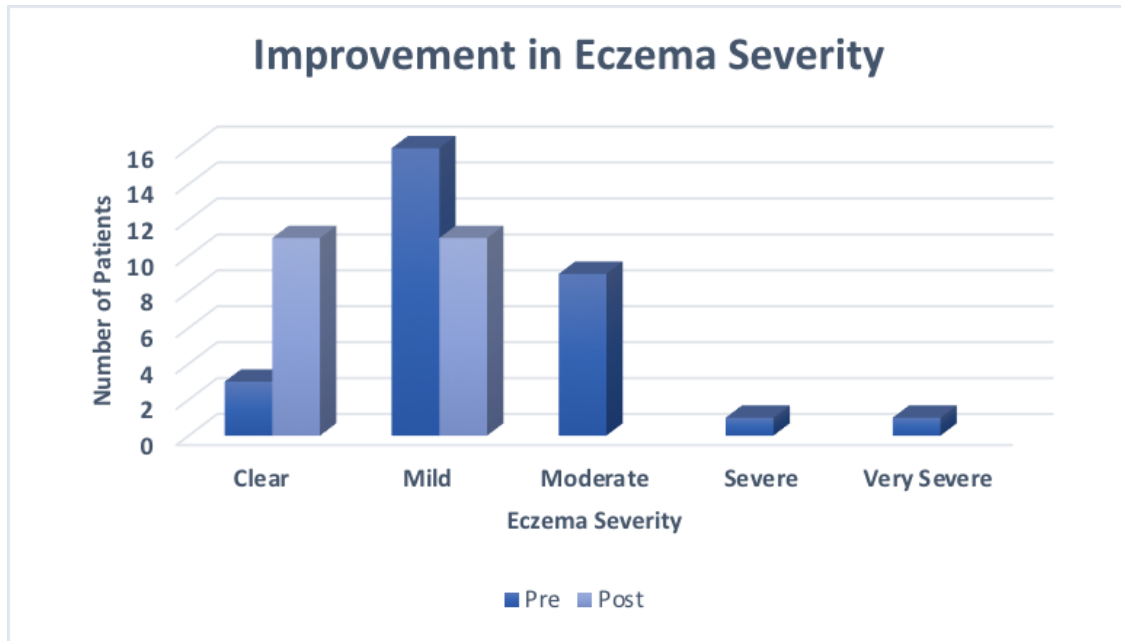


Figure 2: Eczema severity ranged from clear to very severe pre-EAP and improved to clear to mild post-EAP. This illustrates a reduction in eczema severity.

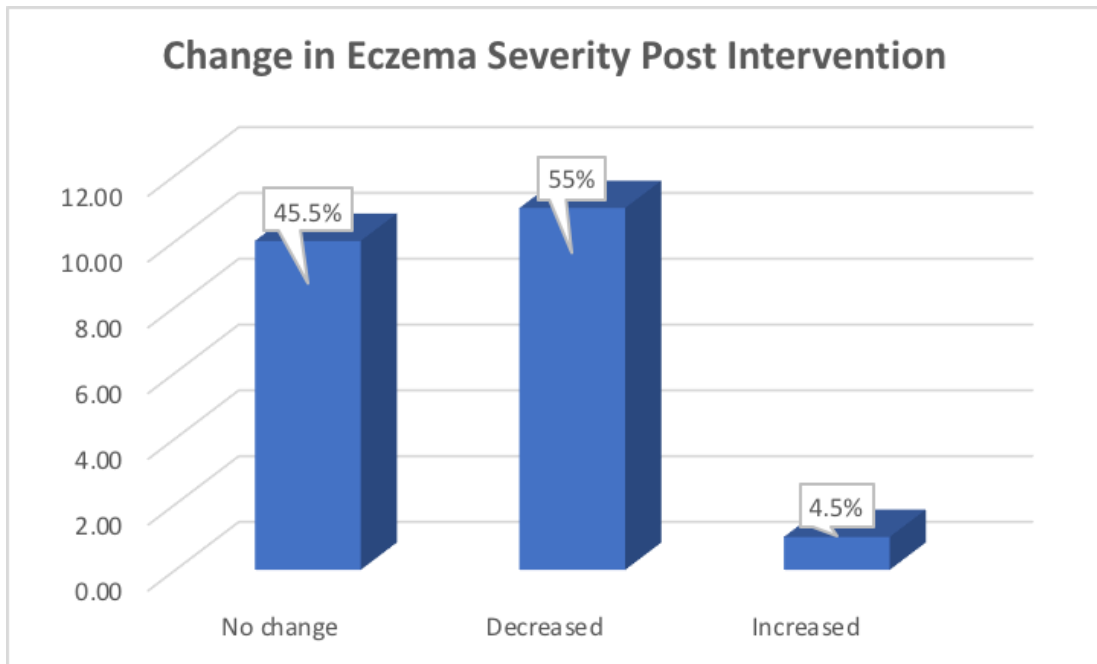


Figure 3: More than half of caregivers reported a decrease in eczema symptoms and nearly half reported symptoms remained unchanged post EAP.

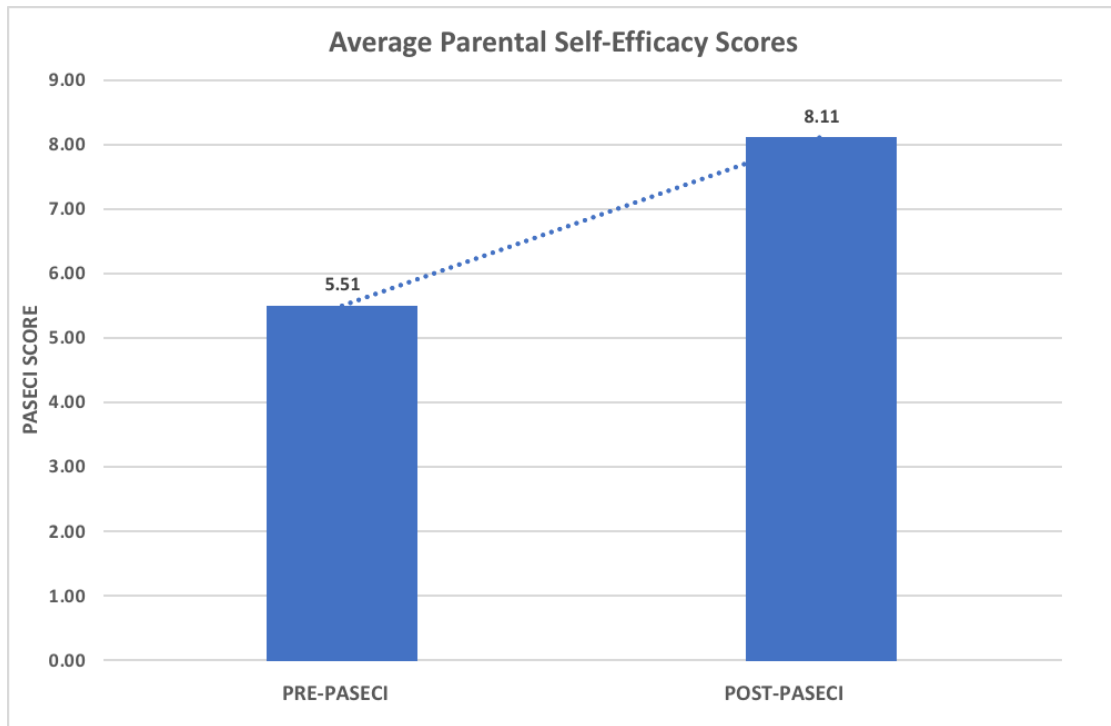


Figure 4: Parental self-efficacy increased by an average of 2.6 PASECI points post-EAP. This illustrates caregivers' improvement in confidence in eczema management.

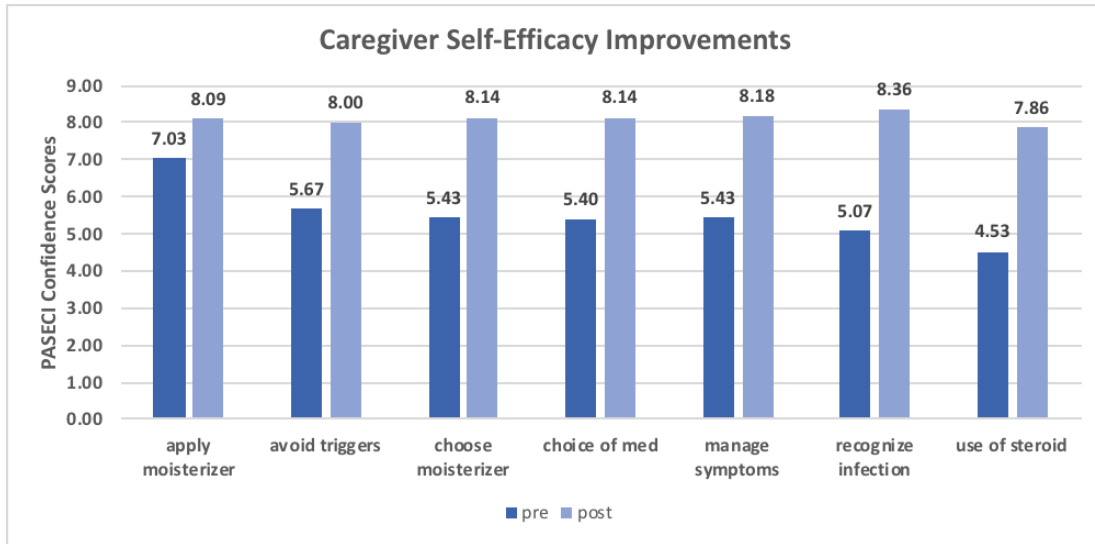


Figure 5: Caregiver self-efficacy improved in all measured categories post-EAP.

Appendix A

Demographics Questionnaire

Demographics Questionnaire

To be completed by parent/caregiver

Please circle your answer

1. Are you the caregiver of this child?

Yes No

2. Who is filling out this form?

Parent Grandparent Relative Guardian

3. What is **your** age?

Less than 18 years 18-25 years 26-35 years 36-45 years 46-65 years

4. Is English your primary language?

Yes No If No, what is your primary language? _____

5. Do **you** work or attend school:

Full-time Part-time Not currently working or attending school

6. What is the age of the child with eczema?

7. What is the sex of the child?

Male Female

MANAGING CHILDHOOD ATOPIC DERMATITIS

8. What is the race of the child?

White

Black

Hispanic

Asian

Other

Appendix A (continued)

Prefer not to answer

9. Does the child have asthma?

Yes No

10. Does the child have food allergies?

Yes No

If Yes, what foods? _____

11. Is there any **family** history of:

asthma food allergies seasonal allergies none

12. Are there any smokers in the home where the child lives?

Yes No

13. How long has your child had eczema?

Less than 6 months 6-12 months more than a year

14. Have you ever received an Eczema Action Plan before?

Yes No

Appendix B

Patient-Oriented Eczema Measure for Children

POEM (Patient-Oriented Eczema Measure)- for proxy completion by caregiver

Please circle one response for each of the seven questions below about your child's eczema. If your child is old enough to understand the question then please fill in the questionnaire together. Please leave blank any questions you feel unable to answer.

1. Over the last week, on how many days has your child's skin been itchy because of their eczema?

No days 1-2 days 3-4 days 5-6 days Every day

2. Over the last week, on how many nights has your child's sleep been disturbed because of their eczema?

No days 1-2 days 3-4 days 5-6 days Every day

3. Over the last week, on how many days has your child's skin been bleeding because of their eczema?

No days 1-2 days 3-4 days 5-6 days Every day

4. Over the last week, on how many days has your child's skin been weeping or oozing clear fluid because of their eczema?

No days 1-2 days 3-4 days 5-6 days Every day

5. Over the last week, on how many days has your child's skin been cracked because of their eczema?

MANAGING CHILDHOOD ATOPIC DERMATITIS

No days 1-2 days 3-4 days 5-6 days Every day

6. Over the last week, on how many days has your child's skin been flaking off because of their eczema?

No days 1-2 days 3-4 days 5-6 days Every day

7. Over the last week, on how many days has your child's skin felt dry or rough because of their eczema?

No days 1-2 days 3-4 days 5-6 days Every day

Appendix C

Parental Self-Efficacy with Eczema Care Index

MANAGING MEDICATION/ECZEMA AND SYMPTOMS: How CONFIDENT do you feel that you can:

1. Choose a moisturizer (grease) that is suitable for your child _____

0 1 2 3 4 5 6 7 8 9 10
Cannot do Highly certain can do

2. Successfully apply moisturizers (grease) to your child's eczema _____

0 1 2 3 4 5 6 7 8 9 10
Cannot do Highly certain can do

3. Correctly use steroid creams for your child _____

0 1 2 3 4 5 6 7 8 9 10
Cannot do Highly certain can do

4. Make the right choice of medication if the symptoms of your child's eczema become worse _____

0 1 2 3 4 5 6 7 8 9 10
Cannot do Highly certain can do

5. Manage to avoid things that irritate/aggravate your child's eczema _____

0 1 2 3 4 5 6 7 8 9 10
Cannot do Highly certain can do

6. Manage your child's eczema so that his/her symptoms are under control _____

0 1 2 3 4 5 6 7 8 9 10
Cannot do Highly certain can do

7. Know what to do if you think your child's eczema has become infected _____

0 1 2 3 4 5 6 7 8 9 10
Cannot do Highly certain can do

Appendix D

American Academy of Dermatology Eczema Action Plan

Eczema Action Plan

Eczema under control

Skin soft, supple, maybe some dryness

- 1 Bathe (5-10 minutes) in lukewarm water every _____.
- 2 Apply moisturizer to all skin within 3 minutes of finishing bath.
- 3 Apply moisturizer **2 more times** during day to skin that feels dry or often flares.

Eczema flare

Itchy skin with redness or rash

- Use your child's medicine and moisturizer (shown below) as often as indicated.
- Bathe your child (5-10 minutes) in lukewarm water every _____.
- Within 3 minutes of bathing:
 - Apply child's medicine (shown below) to the eczema.
 - Apply child's moisturizer, skipping areas with medicine. You don't want to apply moisturizer on top of the medicine.

Medicine for mild flare *(redness, some itch)*

Face _____ Apply _____ times a day (maximum ____ days)
 Scalp _____ Apply _____ times a day (maximum ____ days)
 Body _____ Apply _____ times a day (maximum ____ days)

Medicine for moderate or severe flare *(very itchy rash)*

Face _____ Apply _____ times a day (maximum ____ days)
 Scalp _____ Apply _____ times a day (maximum ____ days)
 Body _____ Apply _____ times a day (maximum ____ days)

Cleanser

_____ Use _____ times a day

Moisturizer

Day _____ Apply _____ times a day
 Night _____

Other medicine

Itching *(day)*
 Take _____ tsp/cc/pills of _____ in the morning.
 Itching *(night)*
 Take _____ tsp/cc/pills of _____ before bed.
 Skin
 Take _____ tsp/cc/pills of _____ for _____ days,
 taking _____ times per day.

When to call the dermatologist

- Skin weeping, oozing pus
- Skin very painful
- Severe itch
- Fever
- Chills
- Eczema remains the same or barely diminishes with treatment



If your child has a **fever and clusters of itchy blisters**, call your dermatologist immediately. If you cannot reach your dermatologist, take your child to the nearest emergency room.

Dermatologist _____
 Phone _____

Appendix E

Pediatric Society of Dermatology Patient Education Handout

#8: ATOPIC DERMATITIS

PATIENT
PERSPECTIVES

Atopic dermatitis (eczema)

Atopic dermatitis, also called *eczema*, is a common and chronic skin condition in which the skin appears inflamed, red, itchy and dry. It most commonly affects children.

Atopic dermatitis is most likely caused by a combination of genetic and environmental factors. Genetic causes include differences in the proteins that form the skin barrier. When this barrier is broken down, the skin loses moisture more easily, becoming more dry, easily irritated, and hypersensitive. The skin is also more prone to infection (with bacteria, viruses, or fungi). The immune system in the skin may be different and overreact to environmental triggers such as pet dander and dust mites.

Allergies and asthma may be present more frequently in individuals with atopic dermatitis, but they are not the cause of eczema. Infrequently, when a specific food allergy is identified, eating that food may make atopic dermatitis worse, but it usually is not the cause of the eczema.

In infants, atopic dermatitis often starts as a dry red rash on the cheeks and around the mouth, often made worse by drooling. As children grow older, the rash may be on the arms, legs, or in other areas where they are able to scratch. In teenagers, eczema is often on the inside of the elbows and knees, on the hands and feet, and around the eyes.

There is no cure, but there are recommendations to help manage this skin problem.

TREATMENT

Treatments are aimed at preventing dry skin, treating the rash, improving the itch, and minimizing exposure to triggers.

1 GENTLE SKIN CARE TO PREVENT DRYNESS

- » Bathe daily or every-other-day in order to wash off dirt and other potential irritants (the optimal frequency of bathing is not yet clear).
- » Water should be warm (not hot), and bath time should be limited to 5-10 minutes.
- » Pat-dry the skin and immediately apply moisturizer while the skin is still slightly damp. The moisturizer provides a seal to hold the water in the skin.
- » Finding a cream or ointment that the child likes or can tolerate is important, as resistance from the child may make the daily regimen difficult to keep up.
- » The thicker the moisturizer, the better the barrier it generally provides.
- » Ointments are more effective than creams, and creams more so than lotions. Creams are a reasonable option during the summer when thick greasy ointments are uncomfortable.

Appendix F

National Eczema Association Endorsed Over-the-Counter Products

How products qualify for the NEA Seal of Acceptance™

Manufacturers submit product ingredient information, formulation data, and testing results (sensitivity, safety and toxicity) for scientific review by the National Eczema Association. Products eligible for the NEA Seal of Acceptance™ are those that have been created or intended for use by people with eczema or sensitive skin. The Seal of Acceptance Review Panel consists of experts in dermatology, allergy and pediatrics.

The NEA Seal of Acceptance™ program evaluates products in the following categories:

- Personal Care Products
- OTC Drugs
- Household Products
- Fabric Products

The NEA Seal of Acceptance™ Product Directory

The Product Directory contains a listing of products that have received the NEA Seal of Acceptance™. Further information about Seal of Acceptance products can be found on the NEA website.

Personal Care Products

The importance of proper bathing and moisturizing practices cannot be over-emphasized as a treatment for eczema and sensitive skin. Use of mild, fragrance free, low-pH cleansers are best. Moisturizers maintain skin hydration and barrier function. Generic petroleum jelly and mineral oil (without additives) are two of the most effective moisturizing products.

MOISTURIZERS

- AVEENO® Baby Eczema Therapy Moisturizing Cream
- AVEENO® Baby Eczema Therapy Soothing Bath Treatment
- AVEENO® Eczema Therapy Bath Treatment
- AVEENO® Eczema Therapy Moisturizing Cream
- Avène TriXéra® Selectose® Emollient Cream
- Baby Pibu™ Baby Butter
- Baby Pibu™ Hydrating Ointment
- BabySpa® Natural Relief Eczema Cream
- CapriClear®
- CeraVe® Moisturizing Cream
- CeraVe® Moisturizing Lotion
- CeraVe® Renewing SA Cream
- CeraVe® SA Renewing Lotion
- CeraVe® SA Therapeutic Hand Cream
- Cetaphil® RESTORADERM® Skin Restoring Moisturizer
- Curel® Itch Defense® Lotion
- Dove® DermaSeries Extreme Dryness Relief Intense Repairing Rough Patch Treatment

- Dove® DermaSeries Extreme Dryness Relief Intense Repairing Body Eczema Therapy Cream
- Dove® DermaSeries Extreme Dryness Relief Intense Repairing Body Cream
- Exederm™ Baby Lotion
- Exederm™ Baby Moisturizer
- Exederm™ Baby Oil
- Exederm™ Body Lotion
- Exederm™ Body Oil
- Exederm™ Intensive Moisture Cream
- Hydrolatum®
- Glaxal Base® Everyday Moisturizing Lotion
- Glaxal Base® Moisturizing Cream
- Gold Bond® Ultimate Eczema Relief Lotion
- MD Moms® Baby Silk Daily Skin Protection Moisturizing Balm
- MD Moms® Baby Silk Daily Skin Protection Moisturizing Balm – unfragranced
- MD Moms® Baby Silk Dry Skin Rescue Extreme Care Cream – unfragranced
- Mustela® Dermo-Pediatrics Stelatopia® Lipid-Replenishing Balm
- Mustela® Dermo-Pediatrics Stelatopia® Milky Bath Oil
- Mustela® Dermo-Pediatrics Stelatopia® Moisturizing Cream
- NEOSPORIN® ECZEMA ESSENTIALS™ Daily Moisturizing Cream
- Neutrogena® Norwegian Formula® Hand Cream
- Neutrogena® Oil-Free Moisture for Sensitive Skin
- Remarie® Shea Butter Creme
- Theraplex® ClearLotion®
- Theraplex® Eczema Therapy
- Theraplex® Emollient
- Triple Cream®
- Vaseline® 100% Pure Petroleum Jelly
- Vanicream™ Lite Lotion
- Vanicream™ Skin Cream
- Vaniply™ Ointment
- Weleda White Mallow Face Cream
- Weleda White Mallow Body Lotion

CLEANSERS

- Albolene® Moisturizing Cleanser
- AVEENO® Baby Cleansing Therapy Moisturizing Wash
- Avène TriXéra® Selectose® Emollient Cleansing Gel
- Avène TriXéra® Selectose® Emollient Cleansing Bath
- Baby Pibu™ Bathtime Wash
- CeraVe® Hydrating Cleanser
- Cetaphil® RESTORADERM® Skin Restoring Body Wash
- CLn® Body Wash
- CLn® Facial Cleanser
- CLn® Sport Wash
- Dove® DermaSeries Extreme Dryness Relief Ultra Caring Gentle Body Cleanser
- Dove® DermaSeries Extreme Dryness Relief Ultra Caring Gentle Cream Face Cleanser
- Dove® DermaSeries Extreme Dryness Relief Ultra Caring Gentle Cleansing Bar
- Exederm™ Baby Bath

- Exederm™ Body Wash
- Kiss of Nature Oh My Baby!! Fragrance Free Moisturizing Body Bar
- Kiss of Nature Oh My Sassy Baby!! Fragrance Free Moisturizing Body Bar with Goat Milk
- Kiss of Nature Oh My Baby!! Fragrance Free Liquid Castile Hand Soap
- MD Moms® Baby Silk Gentle All-Over-Cleansing Towelettes – unfragranced
- MD Moms® Baby Silk Gentle All-Over-Cleansing Towelettes
- Mustela® Dermo-Pediatrics Stelatopia® Cream Cleanser
- NEOSPORIN® MOISTURE ESSENTIALS™ Daily Body Wash
- Neutrogena® Ultra Gentle Hydrating Cleanser

HAIR PRODUCTS

- Exederm™ Baby Shampoo
- MD Moms® Baby Silk Gentle All-Over Clean Hair & Body Wash
- MD Moms® Baby Silk Gentle All-Over Clean Hair & Body Wash – unfragranced
- Exederm™ Conditioner
- Exederm™ Shampoo

OTC Drugs

Over-the-counter (OTC) medicines are drugs you can buy without a prescription. It is important to take medicines correctly, and be careful when giving them to children. More medicine does not necessarily mean better. You should never take OTC medicines longer or in higher doses than the label recommends. If your symptoms don't go away, it's a clear sign that it's time to see your healthcare provider.

OTC drugs containing hydrocortisone require special care.

- Cortizone-10® Hydratensive™ Eczema Lotion
- Cortizone-10® Intensive Healing Lotion Eczema
- Exederm™ Flare Control Cream
- NEOSPORIN® ECZEMA ESSENTIALS™ Hydrocortisone Anti-Itch Cream

Household Products

Products accepted by NEA avoid certain chemicals, dyes, perfumes, and residues that can irritate eczema and sensitive skin.

- all® FREE CLEAR Laundry Detergent

Fabric Products

Certain clothing, linens, and other fabric products can be beneficial for those with eczema or sensitive skin.

- AD RescueWear wet wrap therapy garments
- DermaTherapy® Pillow Cases
- DermaTherapy® Sheets
- HALO® ComfortLuxe™ Sensitive Skin Sleepwear



Appendix G

Caregiver's Comprehension of Eczema Action Plan

1. How well do you understand your child's Eczema Action Plan? Circle a number.

0 1 2 3 4 5 6 7 8 9 10

No understanding

full understanding

Appendix H

Participant Contact Information and Offer for Incentive Form

1ST ENCOUNTER
USD COPY

RETURN FORMS BY



Date:

Dear Parent/Caregiver,

Thank you for participating in this important pilot project to manage childhood eczema. I would like to find out how well the Eczema Action Plan works for you and your child in **6 weeks**.

Please indicate how you would like to return 2 forms:

- POEM (Patient-Oriented Eczema Measure)
- Parental Self-Efficacy with Eczema Care Index

Take a picture of the forms and text to (XXX) XXX-XXXX.

Phone call. Best time to call _____

Please e-mail forms to XXXXXXXXXXXXXXXX.

As an appreciation for your participation, I would like to offer you a \$20 gift card to Walmart at the completion of the study. Please provide your contact information which will remain private and will not be shared.

Parent/Caregiver Name _____

Address _____

Phone number _____

E-mail address _____

Thank you,

Tiffany Sena, BSN, RN, Doctor of Nursing Practice Candidate