Nursing Intervention Program for Mothers Having Children with Atopic Dermatitis Related to Climate Change

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Abstract

Background: Atopic dermatitis is a common chronic, non-contagious inflammatory skin disease affected by climate change. **Aim of the study was** to evaluate the effect of nursing intervention program for mothers having children with atopic dermatitis related to climate change. **Design:** A quasi-experimental research design. **Setting:** This study was conducted at Dermatology Clinic affiliated with Directorate of Health Affairs in Benha City. **Subjects:** A purposive sample of 100 mothers having children with atopic dermatitis throughout six months. **Tools:** Two tools were used in this study: **(I):** An interviewing questionnaire. **(II):** An observational checklist. **Results:** Showed that; 82.0% of studied mothers were married, 40.0% of them had three children, and 55.0% of them had enough monthly income. Also, 26.0% of studied children aged from 3 to less than 4 years, with mean age of 3.51±1.11, 57.0% of them were boys, and 66.0% of them were in nursery school. In addition to there were positive correlation between studied mothers' total knowledge score about atopic dermatitis related to climate change and their total practices score pre and post nursing intervention program. **Conclusion:** Less than one fifth of studied mothers had good total knowledge level about atopic dermatitis at pre-nursing intervention program, then this percentage increased to less than three quarters at post nursing intervention program, Also, less than half of the studied mothers had satisfactory level of total practices about atopic dermatitis related to climate change pre-nursing intervention program which was increased to majority post nursing intervention program. **Recommendations:** Continuous application of nursing intervention programs for mothers having children with atopic dermatitis related to climate change to enhance mothers' knowledge and practices.

Keywords: Atopic dermatitis, children, climate change, mothers, nursing intervention program

Introduction:

Climate Change (CC) is the long-term increase in the earth's average surface temperature and the large-scale changes in global, regional, and local weather patterns, caused by a significant increase in the levels of greenhouse gases that are produced by the use of fossil fuels. CC is associated with rising temperatures, extreme weather events, increased aeroallergen production, and air pollution. These climate-associated phenomena exacerbate the environmental triggers that responsible for the occurrence of Atopic Dermatitis (AD) **(Kam et al., 2023; Blok, 2024).**

Atopic dermatitis is a common chronic, non-contagious inflammatory skin disease characterized by dry skin, localized red scaly patches and intense itching as well as skin pain. AD is also known as atopic eczema, neurodermatitis, or just simply as eczema. Typically, symptoms of AD appear in

children up to 3 months of age. About 60% of AD cases are diagnosed in children up to 1 year of age, and 90% up to 5 years of age. The etiology of AD is not fully understood but there are many factors and triggers which may play a role in development of AD. These factors include interactions between genetic and environmental factors, skin barrier disruption, microbiome alterations, and immune dysregulation **(Al Nahas et al., 2024).**

Mothers play an important role in the management of children with AD. Mothers should establish a daily and nightly skin care routine to stay consistent with treatments which should apply skin moisturizers liberally to damp skin after bathing, and pat the skin dry, also should avoid products with dye and alcohol which can irritate children skin. Mothers should make lifestyle adjustments through avoiding synthetic or wool fabrics that irritate children skin, keep children fingernails short to prevent skin damage from scratching, wash all soft toys, blankets and stuffed animals weekly in fragrance-free detergent to remove allergens, using air purifiers and humidifiers can also reduce indoor allergens and dry air that exacerbate AD. Stress management techniques like meditation, yoga and talking to others can benefit both children and mothers **(Anwar & Al Dafiri, 2023).**

Community Health Nurse (CHN) plays a central role in the assessment and management of AD in children. CHNs are in an ideal position to build strong and often long-term relationships with children and their mothers. Such engagement promotes trust, assists in setting realistic expectations of treatment and outcomes, and enhances engagement in the care. Providing emotional support, as well as formal and systematic education all contributes to improved treatment of AD children. Also, CHN should actively educate children and mothers about CC negative impact on AD disease and taking action to protect children from adverse health effects **(Van Os-Medendorpet al., 2020; Badawy et al., 2023).**

Significance of the study:

Climate change is responsible for a minimum of 150,000 deaths every year worldwide, a number that is expected to double by 2030. Egypt is considered one of five highly vulnerable countries in the world to CC due to its triple effect: the weather, low rainfall, and hot summers; the nature of the land (large desert) and densely populated cities and geography **(Anwar et al., 2022; Ibrahim et al., 2023).** Warming temperatures in already hot countries such as Egypt are associated with worse health outcomes. Child health in Egypt would be significantly worse under higher warming scenarios. Even if the 1.5°C target is met, child mortality in Egypt is projected to increase by around 2.3% by 2050 and by around 1.4% by 2070. However, under the near-catastrophic warming scenario, child mortality is projected to increase by nearly 7.5% and nearly 9.5% by 2050 and 2070 **(Dasgupta & Robinson, 2022).**

Atopic dermatitis is a chronic relapsing skin disease, characterized by impaired skin barrier and altered cutaneous innate immunity that affects children more than adults. The estimated AD prevalence among Egyptian children was 10–12% with different severity levels and complications **(Mohamed et al., 2021).**

Aim of the Study:

The aim of this study was to evaluate the effect of nursing intervention program for mothers having children with atopic dermatitis related to climate change.

Research hypothesis:

Implementation of nursing intervention program will improve mothers' knowledge and practices toward caring of their children

with atopic dermatitis related to climate change.

Subjects and Method:

Research design:

A quasi-experimental research design was used in this study.

Setting:

The study was conducted at Dermatology Clinic affiliated with Directorate of Health Affairs in Benha City because increase rate of children less than five years with atopic dermatitis related to climate change, and followed by home visits.

Subjects:

A purposive sample of 100 mothers having children with atopic dermatitis related to climate change throughout six months was chosen in this study according to the following inclusion criteria:

- Mothers agree to participate in the study.
-Children didn't have other dermatological condition.

Tools of data collection:

Two tools were used to collect the data:

Tool I: An interviewing questionnaire; it was developed by researchers based on reviewing related literature; it was written in simple Arabic language. It was adopted from **Atakan et al., (2022); Belzer & Parker (2023); Hoss, (2022); & Sullivan, (2022)** which consisted of four parts:

First part: A- It included socio-demographic characteristics of the studied mothers. It included of 7 items about (age, educational level, marital status, occupation, number of children, residence, and income).

B- It included personal characteristics of studied children with atopic dermatitis. It included of 5 items about (age, sex, birth order, the child is in nursery school, and age of child when joined to nursery school).

Second part: A- It was concerned with knowledge of studied mothers about climate change. It included of 10 items.

B- It was concerned with knowledge of studied mothers about atopic dermatitis. It included 9 items.

Knowledge scoring system:

It was calculated as follows 2 score for correct and complete answer, and 1 score for correct incomplete answer, while 0 score for don't know. These scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a present score. Mother's total knowledge score was classified as the following:

Total scores of knowledge = 38 points

- **Good knowledge** when the total score was ≥75% (≥ 29 points).
- **Average knowledge** when the total score was 50 to <75% (19< 29 points).
- **Poor knowledge** when the total score was less than 50 % (< 19 points).

Third part: It was concerned with mothers' reported practices regarding caring of their children with atopic dermatitis related to climate change. It was consisted of 3 items: -

A- Mothers´ reported practices regarding protection of their children during very cold weather. It included of 7 sub items.

B- Mothers´ reported practices regarding protection of their children during very hot weather. It included of 6 sub items.

C- Mothers´ reported practices regarding protection of their children from atopic dermatitis flare up. It included of 9 sub items.

Tool II: An observational checklist: Which consisted of 2 parts:

Part I: To assess observational practices of studied mothers. It was adopted from **(Nicol & Ersser, 2010; Perry et al., 2018)** which consisted of 3 items:

- Practices of studied mothers regarding hand washing. It included 4 sub items.

- Practices of studied mothers regarding daily skin care for their children. It included 8 sub items.
- Practices of studied mothers regarding reducing skin irritation for their children. It included 8 sub items.

Practices scoring system:

It was calculated as follows 1 score for done and 0 score for not done. These scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a present score. As well as mother's total practices score was classified as the following:

Total scores of practices = 42 points

- **Satisfactory practices** when the total score was ≥ 60% (≥ 25 points).
- **Unsatisfactory practices** when the total score was <60% (< 25 points).

Part II: To assess home environment of studied mothers. It was adopted from **(Liu et al., 2022; Takaoka et al., 2022)** which consisted of 11 sub items.

Environmental scoring system: 1 score was given for present and 0 score was given for not present. The score of each item summed-up and then converted into a percent score. The total scoring system in environmental part was classified as the following:

The total Environment score = 11 points

- **Sanitary environment** if score was ≥ 60% (≥ 7 points).
- **Unsanitary environment** if the score was > 60% (< 7 points).

Content validity of the tools:

The tools were reviewed by five experts from the Community Health Nursing Specialties Department, Benha University and gave their opinion for clarity, relevance, comprehensiveness, appropriateness, legibility, applicability and easiness for implementation and according to their opinion minor modifications were carried out.

Reliability of tools:

Reliability of the tools was applied by the researchers for testing the internal consistency of the tool by administration of the same tool to the same subjects under similar conditions on one or more occasion. Answers from repeated testing were compared (test re-test reliability). The reliability of the tools was done by Cronbach's Alpha coefficient test which revealed that each of the two tools consisted of relatively homogeneous items as indicated by the moderate to high reliability of each tool. The internal consistency of knowledge was 0.67. The internal consistency of practice was 0.85.

Ethical considerations:

All ethical issues were assured; approval to conduct the study was obtained from the Scientific Research Ethics Committee, REC-CHN-P:81, Faculty of Nursing, Benha University and authorized personnel concerning title, objectives, tools; the study technique was illustrated to gain their cooperation which is needed to allow the researchers to meet the studied sample at chosen settings. Oral consent has been obtained from each mother before conducting the interview and given them a brief orientation to the purpose of the study. They were also reassured that all information gathered would be treated confidentially and used only for the purpose of the study. They had the right to withdraw from the study at any time without giving any reasons.

Pilot study:

A pilot study was carried out through the first two weeks of September 2023 on 10 mothers. The pilot was carried out to ensure clarity and applicability of the constructed interviewing questionnaire and detect any obstacles or problems that may hinder the

data collection. According to the results obtained from data analysis, items didn't need for correction or modification, so the pilot study included in the total sample.

Field work:

Preparatory and assessment phase:

Preparation of the study design and data collection tools based on reviewing current and past available national and international related literatures about atopic dermatitis related to climate change. This was necessary for the researchers to be acquainted with and oriented about aspects of the research problem as well as assist in the development of the data collection tools.

Based on pre–test data obtained from interviewing questionnaire and observed checklists, as well as literature review, the nursing intervention program was developed by the researchers. It was implemented immediately after pre–test. In this phase of the program the researchers assessed knowledge and practices of mothers regarding atopic dermatitis related to climate change through collection and analysis of baseline from the filled tools.

Planning phase:

The researchers identified the important needs for target group, set priorities of needs, goals and objectives and teaching methods and media were developed.

❖ **General objective:**

At the end of nursing intervention program the studied mothers would be able to acquire knowledge and practices regarding atopic dermatitis related to climate change.

❖ **Specific objectives:**

At the end of nursing intervention program the studied mothers would be able to:

- Explain the effect of climate change on children health.
- Express the effect of climate change on children with atopic dermatitis.
- Summarize the steps to reduce the effects of climate change on children health.
- Demonstrate preventive measure for children in very cold weather.
- Show preventive measure for children in very hot weather.
- Demonstrate preventive measures to protect children from flare up.
- Apply steps of daily skin care practices.
- Use steps to prevent skin irritation practices.

Teaching methods: All mothers received the same intervention content using the same teaching methods, there were:

- ✓ Lectures.
- ✓ Discussion.
- ✓ Demonstration and re-demonstration.

Teaching media: Suitable teaching media were specially prepared for intervention, as: Hand out, pictures, real objects (equipment) and videos.

Methods of evaluation:

- ✓ Feedback (verbal & nonverbal).
- ✓ Re-demonstration and observation.

Implementation phase:

Data were collected over a period of 6 months from the beginning of January 2024 to end of June 2024. Approval was obtained orally after the researchers introduces herself to the mothers after explaining the purpose of the study. The study was conducted by the researchers for the studied mothers in the selected setting and their home through home visits. The researchers visited the dermatology Clinic two days per week (Saturday and Tuesday) from 9:00 A.M. to 12:00 P.M. and other two days of the week (Monday and Thursday) to accomplish home visits to previously selected cases. The average numbers interviewed at the Outpatient Clinics were 1–2 mothers/day depending on responses of mothers.

In this phase the researchers

implemented the nursing intervention program for the mothers at the suitable time through 7 sessions; 4 theoretical and 3 practical. The researchers provided the theoretical sessions through lectures, followed by discussion. Handouts, pictures, and real objects were used during the lecture to enhance acquisition of knowledge and to attract mothers' attention. The average time needed for each session was around 30 – 40 minutes. Each session starts by a summary about what was given during the previous session and the objectives of the new topics and ended with a summary of essential items discussed and performed.

First session: At the beginning of the first session, the researchers welcomes and introduce herself to the mothers, an orientation to the program and its process were presented with clearance general and specific objectives of the program, the meaning of climate change, causes of climate change, the people at risk for climate change, the effect of climate change, and diseases resulting from climate change.

Second session: Covered the effect of climate change on children health, the effect of climate change on skin, the effect of climate change on children with atopic dermatitis, how climate change increases atopic dermatitis flare up, and the steps to reduce the effects of climate change.

Third session: Covered the meaning of atopic dermatitis, causes of atopic dermatitis, signs and symptoms of atopic dermatitis, and the most affected areas in the body with atopic dermatitis.

Fourth session: Covered the high risk groups for atopic dermatitis, complications of atopic dermatitis, ways to prevent atopic dermatitis flare up, and measures taken to treat atopic dermatitis.

Fifth session: Covered preventive measure for children with atopic dermatitis in very cold weather, also in very hot weather, and preventive measures to protect children from flare up.

Sixth session: Covered environmental hygiene practices and steps of hand washing routine.

Seventh session: Covered steps of daily skin care practices, and steps to prevent skin irritation practices.

Evaluation phase:

After implementation the nursing intervention program, the researchers applied the post-test immediately to evaluate the knowledge acquired. Evaluation of the nursing intervention program was done by using the post–test tools which was the same formats of pre–test in order to compare the change in the mothers' knowledge and practices after implementation of the nursing intervention program.

Statistical analysis:

All data were organized, tabulated and analyzed using appropriate statistical test. The data were analyzed by using the Statistical Package for Social Science (SPSS) version 21 which was applied to calculate frequencies and percentages, mean and standard deviation, as well as test statistical significance and associations by using Chi–square test (x2) and Pearson correlation coefficient (r) to detect the relation between the variables (p value).

Significance levels were considered as the following:

- High statistically significant $P \leq 0.001$**
- Statistically significant $P \leq 0.05$*
- Not significant $P > 0.05$

Results:

Table (1): Shows that; 27.0% of the studied mothers aged from 30 to less than 35 years, with mean age was 28.70±5.31, 46.0% of them had secondary education, and 65.0% of them were housewives. Regarding marital status; 82.0% of studied mothers were

married, 40.0% of them had three children, and 55.0% of them had enough monthly income.

Table (2): Demonstrates that; 26.0% of studied children aged from 3 to less than 4 years, with mean age was 3.51±1.11, 57.0% of them were boys and 66.0% of them were in nursery school, whereas 32.0% of children joined to nursery school at age 2 to less than 3 years.

Figure (1): Illustrates that; 45.0% of the studied mothers' had poor total knowledge levels at pre-nursing intervention program, while; only 10.0% of them had poor total knowledge levels at post nursing intervention program, 40.0% of them had average total knowledge levels at pre-nursing intervention program compared to 20.0% had average total knowledge levels at post nursing intervention program. Also, 15.0% of them had good total knowledge levels at pre-nursing intervention program, while; 70.0% of them had good total knowledge levels regarding climate change and atopic dermatitis post nursing intervention program with highly statistically significant difference post nursing intervention program (p value≤ 0.001).

Figure (2): Illustrates that; 45.0% of the studied mothers had satisfactory levels of total practices toward caring of their children with atopic dermatitis related to climate change pre-nursing intervention program which was increased to 81.0% post nursing intervention program. While 55.0% of them had unsatisfactory levels of total practices toward caring of their children with atopic dermatitis related to climate change pre-nursing intervention program then this percentage was decreased to 19.0% post nursing intervention program with highly statistically significant difference post nursing intervention program (p value≤ 0.001).

Figure (3): Shows that; 80.0% of the studied mothers had sanitary home environment while only 20.0% of them had unsanitary home environment.

Table (3): Clarifies that; there were positive correlation between studied mothers' total knowledge about atopic dermatitis related to climate change and their total practices pre and post nursing intervention program.

Table (1): Distribution of studied mothers' socio-demographic characteristics (n=100).

Socio-demographic characteristics	%
Age/ years	
< 20	15.0
20<25	20.0
25<30	23.0
30<35	**27.0**
≥ 35	15.0
Mean ±SD 28.70±5.31	
Educational level	
Primary education	10.0
Secondary education	**46.0**
University and more	44.0
Marital status	
Married	**82.0**
Divorced	10.0
Widow	8.0
Occupation	
Housewife	**65.0**
Employee	35.0
Number of children	
One	15.0
Two	35.0
Three	**40.0**
Four and more	10.0
Residence	
Urban	50.0
Rural	50.0
Income/ monthly	
Enough	**55.0**
Not enough	45.0

Table (2): Distribution of studied children' personal characteristics (n=100).

Children personal characteristics	%
Age/ years	
< 1	15.0
1<2	15.0
2<3	24.0
3<4	**26.0**
4+	20.0
Mean ±SD 3.51±1.11	
Sex	
Girl	43.0
Boy	**57.0**
Birth order	
1st	21.0
2nd	**46.0**
3rd	23.0
4th and more	10.0
The child is in nursery school	
Yes	**66.0**
No	34.0
If yes, age of child (n=66)	
1<2	14.0
2<3	**32.0**
3<4	13.0
4<5	7.0

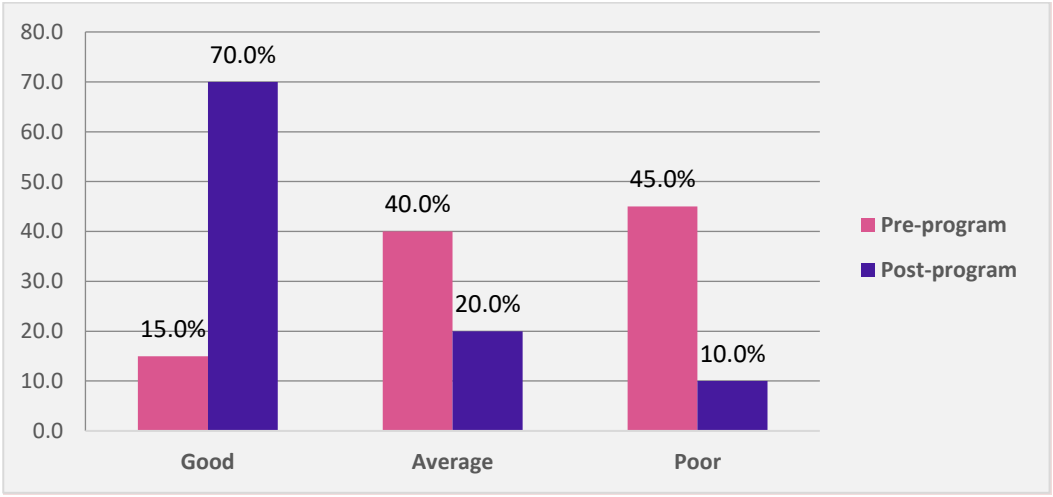

Figure (1): Percentage distribution of studied mothers' total knowledge levels about climate change and atopic dermatitis pre and post nursing intervention program (n=100).

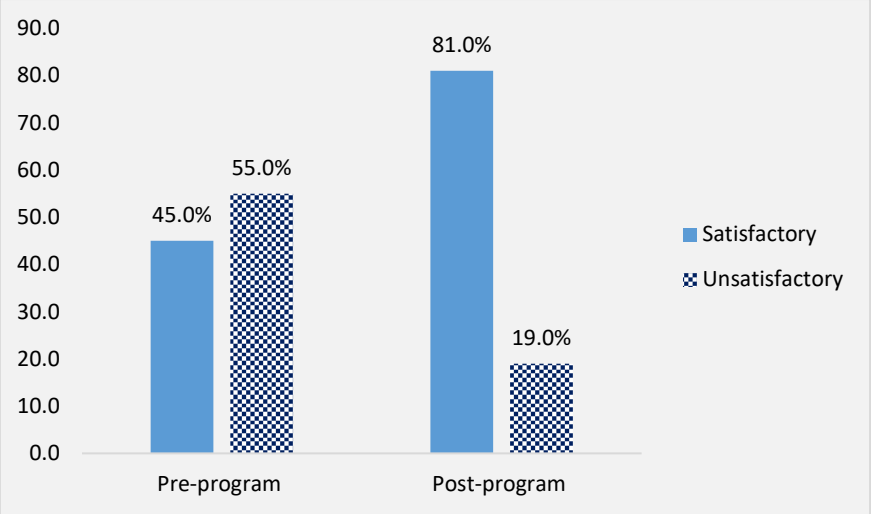

Figure (2): Percentage distribution of studied mothers' total practices level towards caring of their children with atopic dermatitis related to climate change pre and post nursing intervention program (n=100).

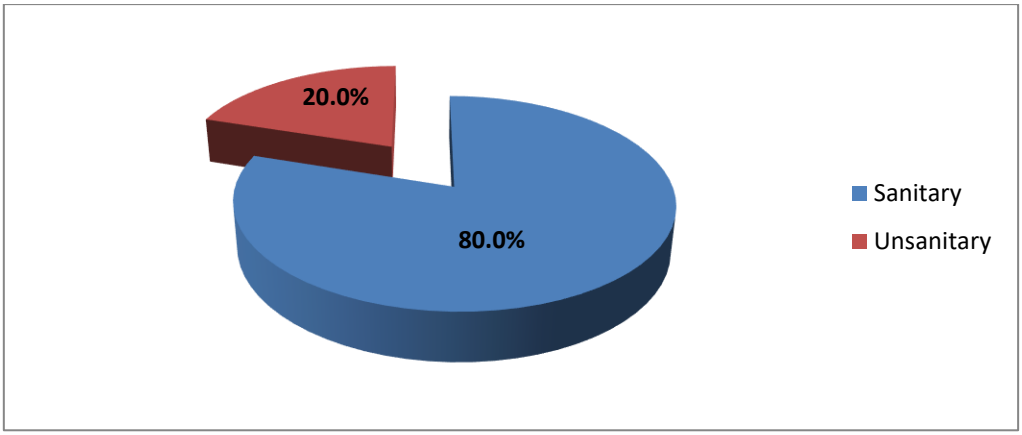

Figure (3): Percentage distribution of studied mothers' total home environment (n=100).

Table (3): Correlation between total knowledge score and total practices score about atopic dermatitis related to climate change among studied mothers at pre and post nursing intervention program (n= 100).

Total practices	Total knowledge			
	Pre- nursing intervention program		Post- nursing intervention program	
	r.	p-value	r.	p-value
	.219	.029*	.575	.000**

Discussion:

Atopic dermatitis is one of the most common and burdensome skin diseases worldwide which affects up to 20% of children globally. AD manifests as a chronic, itchy rash with a large impact on quality of life. Climate change plays a pivotal role in the pathophysiology of AD. Key climatic hazards, namely ultraviolet (UV) radiation, air pollution, and erratic temperatures and humidity, may exacerbate AD in children who are especially susceptible to climatic factors. For instance, toxic levels of UV radiation can induce apoptosis and reduce the expression of key proteins like FLG in the skin barrier. In the immune system, air pollution and other irritants contribute to skin inflammation. Also, rising temperatures and resultant sweating can intensify pruritus, contributing to AD's itch-scratch cycle **(Quan & Lio, 2024).**

Children with AD have an increased risk of allergen sensitization, asthma and food allergy. The cornerstone of AD therapy is dry skin care, typically a short daily bath/shower followed by an emollient applied to all skin. Most children with AD will also require topical medications, such as topical corticosteroids and/or topical non-steroidal therapies. For children with more severe disease, systemic agents including several novel therapies may be required **(Mancini, 2024)**.

Regarding socio-demographic characteristics of studied mothers, the current study showed that more than one quarter of studied mothers aged from 30 to less than 35 years with mean score 28.70±5.31. This finding was supported by **Kelbore et al., (2024),** who studied " Atopic dermatitis in Ethiopian children: a multicenter study of clinical severity, characteristics, and socio-demographic factors in Ethiopia", (n=461), and founded that the mean age of caregivers was 30.43±5.84years. From researchers' point of view this might be due to selection of mothers had children with age of less than five years.

Concerning studied mothers' education level, the current study revealed that less than half of them had secondary education. This finding was in agreement with **Cheng et al., (2021),** who studied "Effects of a self-efficacy theory-based parental education program on eczema control and parental outcomes in China", (n=136), and reported that 44.1% of studied sample had secondary education. From the researchers' point of view this might be due to preferring marriage in young age before enrolling in higher education.

According to mothers' occupation, the current study showed that nearly two thirds of them were housewives. This finding was incompatible with **Choi & Shin, (2024),** who studied "Family management structural model for children with atopic dermatitis in Korea", (n=215), and revealed that more than half (53%) of mothers were employed. From the researchers' point of view this might be due to mothers' intermediate education levels in which the work opportunities became less.

Regarding studied mothers' marital status, the current study revealed that the majority of studied mothers were married. This finding was in agreement with **Kobusiewicz et al., (2023),** who studied " The relationship between atopic dermatitis and atopic itch in children and the psychosocial functioning of their mothers: A cross-sectional study in Poland", (n=88), and they reported that more than two thirds (69.32%) of the studied mothers were married. From the researchers' point of view this might be due to the Egyptian society sanctifies marriage and family building.

As regards the number of children, the current study showed that two fifths of the studied mothers had three children. This

finding was different with **Nummak et al., (2024),** who studied "Parental attitudes and practices regarding atopic dermatitis: A Cross-Sectional Study among a Thai Population in Thailand", (n=372), and revealed that nearly three quarters of mothers (72%) had 1 child. From the researchers' point of view this might be due to the parents' preferences and love for children and the formation of a family.

According to personal characteristics of studied children, the current study demonstrated that more than one quarter of studied children aged from 3 to less than 4 years, with mean age was 3.51±1.11. This finding agreed with **Kelbore et al., (2024),** who reported that the age of the children included in the study ranged from 6 months to 16 years with mean age of children was 3 years old. From researchers point of view this might be due to the atopic dermatitis disease most common in children under five years.

Concerning sex of studied children, the current study demonstrated that more than half 57 % of them were boys. This finding was in agreement with **Kelbore et al., (2024),** who founded that 54.01% of the studied children were boys. While, this finding was in disagreement with **Muzzolon et al., (2021),** who studied " Educational intervention and atopic dermatitis: Impact on quality of life and treatment in Brazil", (n=21), and reported that 60.4% of studied children were girls and 39.6% of them were boys.

Additionally, less than two thirds of studied children were in nursery school, whereas nearly one third of children joined to nursery school at age 2 to less than 3. This finding was compatible with **Choi & Shin (2024),** who showed that more than two thirds (67.5%) of children were preschoolers.

Regarding studied mothers total knowledge level about climate change and atopic dermatitis, less than half of the studied mothers' had poor total knowledge levels at Pre-nursing intervention program while one tenth of them had poor total knowledge levels at post nursing intervention program, two fifths of them had average total knowledge levels at Pre-nursing intervention program compared to one fifth had average total knowledge levels at post nursing intervention program. Also, less than one fifth of them had good total knowledge levels at Pre-nursing intervention program, while; less than three quarters of them had good total knowledge levels about climate change and atopic dermatitis post nursing intervention program with highly statistically significant difference post nursing intervention program (p value≤ 0.001).

These results were compatible with **Lundborg et al., (2020),** who studied " Multidisciplinary educational program for caregivers of children with atopic dermatitis-in South East Norway–an observational study", (n=41), and revealed improvement of caregivers total knowledge and reduction in the severity of the eczema after attending the multidisciplinary AD educational program with highly statistically significant difference post program ($p \leq 0.001$).

Also, these findings were in the same line with **Mohamed et al., (2024),** who revealed that, (69.0%) of studied women had poor total knowledge levels at pre-test then this percentage decreased to only (3.0%) at post-test, and (17.0%) of them had fair total knowledge levels at pre-test compared to (56.0%) of them had fair total knowledge levels at post-test, while (14.0%) of them had good total knowledge levels at pre-test, then this percentage increased to (41.0%) of them had good total knowledge levels at post-test about climate change and atopic dermatitis with highly statistically significant difference post nursing intervention program (p value=

0.001**). From researchers' point of view this might be due to the program effect on improving mothers' knowledge and providing valuable information.

According to total practices level of the studied mothers regarding caring of their children with atopic dermatitis related to climate change, the current study revealed that less than half of studied mothers had satisfactory total practices level toward caring of their children with atopic dermatitis related to climate change at Pre-nursing intervention program while this percentage increased to the majority at post nursing intervention program. While more than half of them had unsatisfactory levels of total practices toward caring of their children with atopic dermatitis related to climate change Pre-nursing intervention program then this percentage decreased to less than one fifth post nursing intervention program with highly statistically significant difference post nursing intervention program (p value≤ 0.001).

These findings were congruent with **Zhao et al., (2020),** who studied "Patient education programs in pediatric atopic dermatitis: a systematic review of randomized controlled trials and meta-analysis in China", (n=2632), and reported that there were improvement of participants practices toward caring of children with topic dermatitis in post program compared to preprogram with highly statistically significant difference post program (p≤0.001). Also, these findings were congruent with **Badawy et al., (2023),** who reported that 4.1% of studied children had a satisfactory level of practices regarding climate change pre-educational intervention. While 78.1% of them had satisfactory level of practices post educational intervention and there was a highly statistical difference between pre and post educational intervention (p=0.000) related to total daily practices related to climate change. From the researchers' point of view this might be due to the effectiveness of the nursing intervention program in improving mothers' practices.

Concerning total home environment of studied mothers, the present study showed that the majority of the studied mothers had sanitary home environment while only one fifth of them had unsanitary home environment. This finding agreed with **Soliman et al., (2024),** who studied "Mother's awareness regarding effect of indoor pollution on child health in Egypt", (n=392) and showed that one third (33.7%) of studied mothers had unsanitary home environment, while two thirds (66.3%) of them had sanitary home environment. This might be due to mothers' awareness regarding the importance of clean home environment in preventing diseases among their children.

Regarding the correlation between total knowledge score and total practices score among studied mothers at pre and post nursing intervention program, the current study clarified that there was statistically significant positive correlation between studied mothers' total knowledge score about atopic dermatitis related to climate change and their total practices score pre and post nursing intervention program.

This finding was similar with **Ahmed et al., (2024),** who studied "Effect of adaptation strategies on raising mother's awareness regarding health consequences of climate change among their children in Egypt", (n=90) and indicated that there was a highly statistically significant difference in the mothers' claimed knowledge and reported practices after implementation of Adaptation Strategies (p<0.000). Also, this result was congruent with **Nie et al., (2024),** which entitled "Knowledge, attitudes, and practices in adult patients and parents of pediatric atopic dermatitis patients in China", (n=599),

and concluded that knowledge significantly affect atopic dermatitis health practices among participants and enhancing participants' education on treatment precautions and skincare can improve adherence and management behaviors. From the researchers' point of view this might be due to as mothers' knowledge increase this positively effect on improving mothers' practices.

Conclusion:

Nursing intervention program succeeded in improved knowledge and practices of the studied mothers having children with atopic dermatitis related to climate change. As evidence, less than one fifth of the studied mothers had good total knowledge levels about atopic dermatitis related to climate change at pre-nursing intervention program, then this percentage increased to less than three quarters post nursing intervention program. Also, more than two fifths of the studied mothers had satisfactory total practices levels toward caring of their children with atopic dermatitis related to climate change at pre-nursing intervention program then this percentage increased to the majority at post nursing intervention program.

Recommendations:

- Continuous application of nursing intervention programs for mothers having children with atopic dermatitis related to climate change to enhance mothers' knowledge and practices.
- Disseminated simplified booklets in all dermatological outpatient clinics as a care guide and reference to all mothers having children with atopic dermatitis related to climate change.

Refrences:

Ahmed, F., Ahmed, E., & Abdullah, A. (2024). Effect of adaptation strategies on raising mother's awareness regarding health consequences of climate change among their children. Egyptian Journal of Health Care; 15(3): 1001-1019.

Al Nahas, S., Abouammoh, N., Althagafi, W., Alomary, S., Almutairi, A., Assiri, A., & Abd-Ellatif, E. (2024). Prevalence, severity, and risk factors of eczema among young children and adolescents in Saudi Arabia: A national cross-sectional study, 2019. Journal of Allergy and Clinical Immunology: Global; 3(4): 100299.

Anwar, M., & Al Dhafiri, M. (2023). Enhancing the parental role in controlling pediatric atopic dermatitis a narrative review. International Journal of Advanced Research; 11(05):1244-1256.

Anwar, W., Bian, A., El Feky, G., El-Meteini, M., Esmat, G., Ghanem, M., & Tiwari, P. R. (2022). Addressing climate change impacts on health. UK universities climate network. 1-13.

Atakan, N., Yalcin, B., Ozkaya, E., Su küçük, Ö., Ozturkcan, S., Salman, A., & Serdaroğlu, S. (2022). Atopic dermatitis diagnosis and treatment consensus report. turkderm-turkish archives of dermatology and venereology; 56(2): 86-121.

Badawy, G., Wady, D., El-Refaay, E., & Ghareb, S. (2023). Effect of climate change educational intervention on knowledge and health-related behaviors of children with respiratory allergic diseases. Tanta Scientific Nursing Journal; 31(4): 169-190.

Belzer, A., & Parker, E. (2023). Climate change, skin health, and dermatologic disease: A guide for the dermatologist. American Journal of Clinical Dermatology; 24(4): 577-593.

Blok, A. (2024). What is climate change? Available at: https://palmetto.com/climate/what-is-climate-change-definition-causes-effects. Accessed on 2 December 2024 at 5:5 p.m.

Choi, S., & Shin, H. (2024). Family management structural model for children with atopic dermatitis. Journal of Pediatric Nursing; 77: e401-e410.

Cheng, N., Chau, J., Lo, S., Choi, K., Hon, K., Lam, P., & Leung, T. (2021). Effects of a self-efficacy theory-based parental education program on eczema control and parental outcomes. Pediatric allergy and immunology; 32(3): 535-543.

Dasgupta, S., & Robinson, E. (2022). Climate change, food consumption and child health in Egypt: How can outcomes be improved?. Available at: https://blogs.lse.ac.uk/africaatlse/2022/11/17/climate-change-food-consumption-and-child-health-in-egypt-how-can-outcomes-be-improved. Accessed on 21 Febraury 2023 at 4:00p.m.

Hoss, E. (2022). Atopic dermatitis - children – homecare. Available at: https://medlineplus.gov/ency/patientinstructions/000939.htm. Accessed on 18 February 2024 10: 35p.m.

Ibrahim, S., Elmawla, A., Abd Elhameed, D., & Ali, S. (2023). Climate change and health: Effect of awareness program on knowledge, attitudes and practices of community dwelling elderly. Tanta Scientific Nursing Journal; 32(4): 245-272.

Kam, S., Hwang, B., & Parker, E. (2023). The impact of climate change on atopic dermatitis and mental health comorbidities: a review of the literature and examination of intersectionality. International Journal of Dermatology; 62(4): 449-458.

Kelbore, A. G., Enbiale, W., van Wyk, J. M., & Mosam, A. (2024). Atopic dermatitis in Ethiopian children: a multicenter study of clinical severity, characteristics, and socio-demographic factors. Frontiers in Medicine; 11: 1410310.

Kobusiewicz, A., Tarkowski, B., Kaszuba, A., Lesiak, A., Narbutt, J., & Zalewska-Janowska, A. (2023). The relationship between atopic dermatitis and atopic itch in children and the psychosocial functioning of their mothers: A cross-sectional study. Frontiers in Medicine; 10: P. 1066495.

Liu, Y., Sun, S., Zhang, D., Li, W., Duan, Z., & Lu, S. (2022). Effects of residential environment and lifestyle on atopic eczema among preschool children in Shenzhen, China. Frontiers in Public Health, 10.

Lundborg, M., Holm, J., Sandvik, L., Lossius, A., Rehbinder, E., Sitek, J., & Berents, T. (2020). Multidisciplinary educational programme for caregivers of children with atopic dermatitis-in South East Norway–an observational study. BMC dermatology; 20(20): 1-6.

Mohamed, A., Salah, E., Bedair, N., Bassiouny, D., Daifalla, A., Behairy, O., & Farag, Y. (2021). Metabolic and inflammatory biomarkers in children with atopic dermatitis (AD): a case-control study. Egyptian Pediatric Association Gazette; 69(1): 1-5.

Muzzolon, M., Imoto, R. R., Canato, M., Abagge, K. T., & de Carvalho, V. O. (2021). Educational intervention and atopic dermatitis: Impact on quality of life and treatment. Asia Pacific Allergy; 11(2): P. e21

Nicol, N., & Ersser, S. (2010). The role of the nurse educator in managing atopic dermatitis. Immunology and Allergy Clinics; 30(3): 369-383.

Nie, Z., Fan, P., Zhou, Y., & Han, S. (2024). Knowledge, attitudes, and practices in adult patients and parents of pediatric atopic dermatitis patients: a cross-sectional study. Frontiers in Public Health; 12: 1460044.

Nummak, P., Techasatian, L., Uppala, R., Sitthikarnkha, P., Saengnipanthkul, S., & Sirikarn, P. (2024). Parental attitudes and practices regarding atopic dermatitis: a cross-

sectional study among a thai population. Children; 11(870): 1-9.

Perry, A., Potter, B., & Ostendorf, W. (2018). Skills performance checklists for clinical nursing skills & techniques, 9th ed., El Sevier, United States of America, 132- 199.

Quan, I., & Lio, P. (2024). A changing climate and atopic dermatitis: Preparing for the future. Available at: https://thedermdigest.com/the-irregular-border-a-changing-climate-and-atopic-dermatitis-preparing-for-the-future/. Accessed on 31 January 2025 at 8:5 a.m.

Soliman, N., Mohamed, H., Sabry, S., & Abd El-Aziz, N. (2024). Mother's awareness regarding effect of indoor pollution on child health. Journal of Nursing Science Benha University; 5(2): 668-682.

Sullivan, D. (2022). Eczema and climate change: What is the connection?. Available at: https://www. Medical news today.com/articles/eczema-climate-change-what-is-the-connection. Accessed on 2 December 2024 at 8:19 p.m.

Takaoka, M., Suzuki, K., & Norback, D. (2022). The home environment and current dermatitis in Japanese junior high school children in Kansai area. Indoor and Built Environment; 31(6): 1557-1563.

Van Os-Medendorp, H., Deprez, E., Maes, N., Ryan, S., Jackson, K., Winders, T., De Raeve, L., De Cuyper, C., & Ersser, S. (2020). The role of the nurse in the care and management of patients with atopic dermatitis. BMC Nurs 19; 102

Zhao, M., Liang, Y., Shen, C., Wang, Y., Ma, L., & Ma, X. (2020). Patient education programs in pediatric atopic dermatitis: a systematic review of randomized controlled trials and meta-analysis. Dermatology and therapy; 10: 449-464.

برنامج تثقيفي لاداء الممرضات عن السلوك الاخضر بمراكز رعاية الامومة والطفوله

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التهاب الجلد التأتبي هو مرض جلدي التهابي مزمن غير معدي شائع يتأثر بتغير المناخ لذلك **هدفت الدراسة** إلى تقييم تأثير برنامج التدخل التمريضي للأمهات اللاتي لديهن أطفال مصابون بالتهاب الجلد التأتبي المرتبط بتغير المناخ. **تصميم البحث:** تم استخدام تصميم شبه تجريبى. **مكان البحث:** تم تنفيذ هذه الدراسة في عيادة الأمراض الجلدية التابعة لمديرية الشؤون الصحية في مدينة بنها. **عينة الدراسة:** وقد اجريت هذه الدراسة على ١٠٠ عينة غرضية من الأمهات اللاتى لديهن أطفال مصابون بالتهاب الجلد التأتبي على مدار ستة أشهر. **النتائج:** كشفت النتائج أن ٨٢,٠٪ من الأمهات الخاضعات للدراسة متزوجات، و٤٠,٠٪ منهن لديهن ثلاثة أطفال، و٥٥,٠٪ منهن لديهن دخل شهري كافٍ. وكشفت أيضا أن ٢٦,٠٪ من الأطفال الخاضعين للدراسة تتراوح أعمارهم بين ٣ و٤ سنوات، بمتوسط عمر ٣,٥١±١,١١و٥٧,٠٪ منهم ذكور، و٦٦,٠٪ منهم في رياض الأطفال. بالإضافة إلى ذلك، وُجد ارتباط إيجابي بين إجمالي درجة معلومات الأمهات الخاضعات للدراسة بالتهاب الجلد التأتبي المرتبط بتغير المناخ وإجمالي درجة ممارساتهن قبل وبعد برنامج التدخل التمريضي. **الاستنتاج:** وقد لخصت النتائج على أن أقل من خمس الأمهات الخاضعات للدراسة لديهن مستوى معلومات كلى جيد حول تغير المناخ والتهاب الجلد التأتبي قبل برنامج التدخل التمرضى، والتي إزدادت إلى أقل من ثلاثة أرباعهن بعد برنامج التدخل التمرضى ، بالإضافة إلى أن أقل من نصف الأمهات الخاضعات للدراسة لديهن ممارسات كلية مرضية حول رعاية أطفالهن المصابين بالتهاب الجلد التأتبي المرتبط بتغير المناخ قبل برنامج التدخل التمرضى والتى تمت زيادتها إلى الأغلبية بعد برنامج التدخل التمرضى. **التوصيات:** و أوصت الدراسة إلى التطبيق المستمر لبرامج التدخل التمريضي للأمهات اللاتي لديهن أطفال مصابون بالتهاب الجلد التأتبي المرتبط بتغير المناخ لتعزيز معلومات الأمهات وممارساتهن.