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The Effect of Parental Health Literacy Level on Appropriate Moisturizer Use in Children with Eczema and Parental Atopic Eczema Knowledge

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ABSTRACT

Objective: Non-adherence to therapy in chronic diseases is a multidimensional concept involving many factors, primarily health literacy (HL). However, the information in the literature evaluating the relationship between the HL level of parents of children with atopic dermatitis (AD) and their knowledge level about treatment and disease remains limited. Therefore, our study aimed to measure the health literacy of mothers of children diagnosed with AD and to investigate the relationship between literacy levels and the severity of their AD, as well as their knowledge of atopic eczema and skin care.

Materials and Methods: The mothers of 100 patients aged ≤2 years diagnosed with AD, based on history, physical examination, and laboratory tests, were invited to participate in the study. A cross-sectional, face-to-face survey-type study was conducted in 2022-2023. The 'Health Literacy Scale-Short Form, the participants' sociodemographic characteristics, AD knowledge levels, daily AD practical approaches, and AD skin care were evaluated with survey questions.

Results: The study was conducted with 100 mothers of children with AD. The participants' median HL score was 33.3, their median atopic dermatitis knowledge level score was seven, and their median AD moisturizer correct use score was four. A positive correlation was found between the health literacy score and maternal education level ($p = 0.036$, $r = 0.21$), while a negative correlation was observed with maternal age ($p = 0.009$, $r = -0.26$). While no statistically significant correlation was found between participants' health literacy scale scores and their AD knowledge scores ($p = 0.89$), a statistically significant and positive correlation was found between health literacy scores and the correct use of moisturizer scores ($p = 0.018$, $r = 0.24$).

Conclusion: Inadequate or limited health literacy, especially among mothers, may lead to insufficient knowledge about moisturizers and inefficient and disproportionate use of these products, which are the basic treatment for AD.

Keywords: Atopic dermatitis, health literacy, skin care, knowledge

INTRODUCTION

Atopic dermatitis is a chronic, recurrent inflammatory skin disease that significantly impacts the quality of life for both children and their parents (1). Its incidence increases worldwide annually, affecting 20% of children and 10% of adults (2). Adequate individual treatment of AD may improve disease outcomes and quality of life (1). Topical moisturizers and anti-inflammatory treatments form the basis of treatment; however, compliance with treatment is unfortunately very low (3).

Non-adherence to treatment is common among parents of children with AD (3). Non-adherence to therapy in chronic diseases is a multidimensional concept that involves the interaction of many factors, primarily health literacy (HL), which is influenced by various factors such as access to and understanding of specific information about

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medical products, doctor-patient communication, and compliance (4).

Health literacy is a term used to describe an individual's ability to comprehend and effectively use complex health-related information. It refers to an individual's ability to access, understand, and use information to support and maintain a healthy lifestyle, resulting from individual health education and communication activities (5,6). Individuals lacking adequate health literacy (HL) are limited in their ability to acquire basic information about chronic diseases, make informed health decisions, receive sufficient services, understand and utilize the data they develop, and effectively manage their illness. They often have less knowledge about the disease, are less able to self-manage, and may experience poorer health outcomes (5,6). A study of adult AD patients found that 32.4% had limited health literacy (8.4% inadequate and 24.0% problematic). Inadequate literacy levels were associated with a deterioration in the quality of life. It was emphasized that this may be related to insufficient AD self-care (7). There is no comprehensive study evaluating the mothers of babies with AD from this perspective.

A recent study in adults with AD and parents of children with eczema showed that low HL was associated with a higher risk of steroid phobia (8). However, the information in the literature evaluating the relationship between the HL level of mothers of children with AD and their knowledge level about treatment and disease remains limited. Therefore, our study aimed to assess the health literacy of mothers of children diagnosed with AD, identify the sociodemographic factors influencing this literacy, and examine the relationship between literacy levels and mothers' knowledge of AD and skin care.

MATERIALS and METHODS

Study Group and Data Collection

The mothers of 100 patients, aged ≤2 years and diagnosed with AD based on history, physical examination, and laboratory tests between 2022 and 2023 at the Pediatric Allergy and Immunology Outpatients Department, who were followed up for a minimum of four months, were invited to participate in the study (1). A cross-sectional, face-to-face survey-type study was conducted. Since mothers are responsible for the basic care of their children, the survey was planned to be conducted with mothers. All patients received standardized information. They were instructed on how to use moisturizers and how often to apply them. Detailed information about disease pathogenesis, etc., was not provided.

Inclusion criteria for the study

The mothers of patients who had been previously examined by a doctor and diagnosed with AD, followed for at least four weeks, and had no other chronic diseases were included in the study. Additionally, mothers who were literate and had no physical disabilities that prevented them from completing the survey were included.

Exclusion criteria for the study

To ensure the objective and reliable conduct of the study, participants (mothers) with language, visual, or cognitive impairments were excluded. Additionally, mothers of patients with chronic diseases other than AD, illiterate mothers, and mothers who completed the questionnaire incompletely were excluded.

Monitoring and evaluation of the working group

The demographic characteristics of the study participants, including age at diagnosis, follow-up period, and history of allergic disease, were evaluated. In addition, the sociodemographic characteristics of the parents, history of AD disease, AD knowledge levels (as measured by the AD knowledge level score), daily practical approaches to managing AD, and AD skin care (as assessed by the AD moisturizer correct use score) were evaluated using survey questions (9-12). In the literature, the questionnaire validated for measuring parents' information attitudes and experiences related to AD has been translated into Turkish and used. A score of one point was given for a correct answer and zero points for an incorrect answer (a maximum score of 10) (10). When calculating the AD moisturizer correct use score, one point was given for each correct answer and zero points for each incorrect answer. There were eight questions in total. The maximum score was calculated as 8 (9).

Forms Used in the Study

For the assessment of family literacy, the 'Health Literacy Scale-Short Form', which has been previously proven effective and reliable internationally (13) and has demonstrated effectiveness and reliability in national studies (14), was used.

Health Literacy Scale (HLS)-Short Form:

The formula (Index = (Average-1) x 50/3) is used when evaluating the scale. The average is calculated by dividing the total scale score by the number of scale items. The computed index value ranges from 0 to 50; a higher score indicates better health literacy. The scale includes 4-point Likert-type response options, ranging from 1 (very difficult) to 4 (very easy), and consists of 12 items.

The survey questions consisted of four sections. The first section asked about the patients' and mothers' demographic characteristics. Then, ten questions from the literature evaluated the general knowledge of AD in parents. In the last section, a scale measuring the participants' health literacy levels was applied (13,14).

The survey was conducted on 20 parents of children with AD as a pilot. It was found that the questions were sufficiently understandable and answerable.

Ethical approval (Date: 12.12.2022, No:1) was obtained from Dicle University Medical Faculty Ethics Committee for the study. Ethical consent was obtained from all mothers.

Statistical Method

Statistical analysis of the data was performed using the SPSS 24 (SPSS Inc., Chicago, Illinois) software. Conformity of the variables to a normal distribution was examined using both visual (histograms and probability plots) and analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk tests). Descriptive statistics were presented using the median for numerical variables that were not normally distributed (non-parametric) and the mean for normally distributed numerical variables (parametric). Correlation coefficients and statistical significances for relationships between variables, at least one of which was not normally distributed or ordinal, were calculated using the Spearman or Pearson correlation test, as appropriate. When comparing numerical variables between parameters, the t-test was used for parametric data, and the Mann-Whitney U Test was used for non-parametric data. The chi-squared test was used to compare categorical variables between groups. The statistical significance level (two-way) was set at $\alpha < 0.05$. Statistical power analysis was performed using the G-Power program. This study determined the effect size to be 0.50 (using Cohen's criteria), with an alpha level of 0.05 and a power of 0.7. The minimum number of patients required was defined as 100. Ten participants were excluded from the study because they did not complete the questionnaire correctly.

RESULTS

The study was conducted with 100 mothers of children with AD. The median age of the patients was 9 months (IQR 4-24), and more than half (64%) were female. The median age at diagnosis of AD was three months, and the median follow-up period was one month. Food allergy was the most common comorbid allergic disease accompanying the patients' eczema (33%).

The median age of the mothers was 30 years (IQR 27-33), half of them were university graduates (50%), and the majority were unemployed (76%). When the monthly income of the families was evaluated, their income was often equal to or more than their expenses (70%), and most of them lived in the city (72%) (Table I).

Table I: Sociodemographic characteristics of patients and mothers (n=100).

Parameter		
Female (%) / Male (%)		64 / 36
Age (months), median (IQR_{25-75})		9 (4-24)
Median age at diagnosis of atopic dermatitis, months (IQR_{25-75})		3 (2-6)
Atopic dermatitis follow-up period, month (IQR_{25-75})		1 (1-4)
Other comorbid allergic diseases, n (%)	Food Allergy,	33 (33)
	Allergic Rhinitis,	12 (12)
	Asthma,	8 (8)
Maternal age (years), median (IQR_{25-75})		30 (27-33)
Mother's education level, n (%)	University	50 (50)
	High school	16 (16)
	Middle school	15 (15)
	Primary school	14 (14)
	Only literate	5 (5)
Does the mother work?, n (%)	Yes	24 (24)
	No	76 (76)
Monthly earnings, n (%)	Income is equal to/or more than expenses	70 (70)
	Income is lower than expenses	30 (30)
Place of residence, n (%)	City	72 (72)
	Town	19 (19)
	Village	9 (9)

IQR: Interquartile Range

Table II: Evaluation of participants' health literacy scale score, atopic dermatitis knowledge level score, and atopic dermatitis moisturizer correct use score.

Parameter	
Health literacy scale (HLS) score, median (min-max)	33.3 (12.5-50)
Atopic dermatitis knowledge level score, median (min-max)	7 (3-10)
Atopic dermatitis moisturizer correct use score, median (min-max)	4 (1-8)

Table IV: Evaluation of sociodemographic factors that may affect mothers' health literacy scores.

Parameter		HLS score median (min-max)	p
Is the mother working? n (%)			
Yes	24 (24)	33.3 (16.6-48.6)	0.82
No	76 (76)	33.3 (12.5-50)	
Monthly earnings, Income is equal to or more than expenses, n (%)			
Yes	70(70)	33.3 (16.6-50)	0.046
No	30 (30)	28.5 (12.5-48.6)	
Place of residence, n (%)			
Village	9 (9)	34.7 (22.2-45.8)	
Town	19 (19)	31.9 (16.6-50)	0.84
City	72 (72)	33.3 (12.5-50)	
Mother's history of atopic dermatitis, n (%)			
Yes	20(20)	33.3 (15.2-50)	0.59
No	80 (80)	33.3 (12.5-50)	

Table V: Relationship between health literacy scale score and mothers' daily approaches to managing atopic dermatitis.

Parameter			Median (min.-max.)	p
Daily moisturizer, n (%)	Yes	88(88)	33.3 (12.5-50)	0.94
	No	12 (12)	32.6(15.2-50)	
Regular daily antihistamine, n (%)	Yes	4 (4)	34.6 (31.9-40.2)	0.48
	No	96 (96)	33.3 (12.5-50)	
Regular bath oil, n (%)	Yes	86 (86)	34.7 (25-50)	0.3
	No	14(14)	32.6 (12.5-50)	
Regular anti-allergic shampoo, n (%)	Yes	70 (70)	34 (19.4-48.6)	0.28
	No	30 (30)	31.9 (12.5-50)	

Table III: Assessment of the relationship between the demographic characteristics of mothers and children with atopic dermatitis and the mothers' health literacy scores.

Parameter	p	r
Patient age at diagnosis	0.79	0.03
Follow-up period for patients	0.88	0.02
Mother's education level	0.036	0.21
Maternal age	0.009	-0.26

It was determined that 88% of the mothers used regular daily moisturizers. The participants' median HLS score was 33.3 (min-max:12.5-50), and their median AD knowledge level score was 4 (min-max:1-8). The median AD knowledge level score was 7 (min-max:3-10) (Table II).

The evaluation of demographic characteristics of mothers and children with AD, as well as mothers' health literacy scores, was conducted. A positive correlation was found between the health literacy score and maternal education level ($p = 0.036$, $r = 0.21$), and a negative correlation was found with maternal age ($p = 0.009$, $r = -0.26$) (Table III).

Evaluation of sociodemographic factors that may affect mothers' health literacy scores is presented in Table IV. Participating mothers with higher monthly incomes had higher health literacy scores ($p = 0.046$).

No statistically significant relationship was found between the health literacy score and the use of daily moisturizer ($p = 0.94$), daily antihistamine ($p = 0.48$), regular bath oil ($p = 0.30$), and regular anti-allergic shampoo ($p = 0.28$) (Table V).

While no statistically significant correlation was found between the participants' AD knowledge level score and the health literacy scale score ($r = -0.014$, $p = 0.89$), a statistically significant positive correlation was found between the AD eczema moisturizer correct use score ($p = 0.018$, $r = 0.24$) (Table VI).

Table VI: Evaluation of the relationship between participants' health literacy scale score and atopic dermatitis knowledge level and atopic dermatitis skin care knowledge level scores.

Parameter	r	p
Atopic dermatitis knowledge level score	-0.014	0.89
Atopic dermatitis moisturizer correct use score	0.24	0.018

DISCUSSION

Although non-adherence remains a well-recognized challenge in the management of AD (15), few studies have investigated its underlying causes in depth. One potentially significant but underexplored factor is parental health literacy (HL), which affects how families access, interpret, and implement treatment recommendations (16-19). Previous research has mainly focused on assessing parents' knowledge of AD (9,10), without examining how HL influences this knowledge. In our study, HL was not significantly associated with general knowledge about the disease itself. Still, it was clearly linked to parents' knowledge regarding AD-specific skin care, particularly the use of moisturizers. These findings suggest that HL is crucial for the effective implementation of skin care routines, which are central to AD management, and may represent a modifiable target for improving treatment adherence in affected children.

Our study found a significant negative relationship between mothers' health literacy scores and maternal age. Young mothers may have entered the parenting role without adequate knowledge about their children's health (20,21). Multiple factors, including inexperience in caring for their children, less life experience, and the time it takes to adapt to the healthcare system, may contribute to their limited access to accurate information, understanding of terminology related to their children's illnesses, and, most importantly, their ability to make decisions about their children's health. The limited number of studies in the literature on children with atopic eczema complicates our understanding of this issue.

In a study measuring the knowledge, attitudes, and behaviors of the parents of 372 children with AD, no significant differences were observed between the level of awareness and gender, number of children, level of education, and occupation (22). In another study evaluating the knowledge and experience of the parents of 70 AD babies, no relationship was found between the parents' AD knowledge score and the parents' level of education, place of residence, the age at which their children were diagnosed with AD, and the duration of follow-up, age, or gender. However, it was determined that older parents and those with higher monthly incomes had higher knowledge levels (10). The study did not reveal any statistically significant association between health literacy scores and patients' age at diagnosis, duration of follow-up, or maternal employment. The age at which a child is diagnosed with atopic eczema is unlikely to affect a mother's health literacy on its own. A mother's ability to obtain information after diagnosis may depend on her efforts, level of education, and her effectiveness in utilizing the healthcare system (23,24). While it is expected that a mother with longer follow-up will also acquire more health information, the mother is the most critical factor here. If a mother remains passive during follow-up and fails to grasp the information she learns about her child's eczema, her health literacy can be expected to be negatively impacted. Therefore, early or late diagnosis may not directly determine health literacy levels. Also, working mothers should not always be expected to have high levels of health literacy. Working mothers may dedicate less time to health literacy than non-working mothers due to time constraints (25). This variable is a complex and multifaceted factor.

Although the literature reports that health literacy is below average in rural areas, widespread internet use has now eliminated rural-urban disparities (26). This may be dependent on multiple socioeconomic factors, including education, income, and access to healthcare. While our study did not demonstrate an effect of place of residence on mothers' health literacy, the study design may have constrained a more comprehensive evaluation of multiple influencing factors.

Our study found that mothers' atopic eczema had no impact on their health literacy levels. People with chronic illnesses often struggle to understand the medical knowledge and terminology related to their condition (22,24). The mother may not have entirely accepted the illness, may remain passive, or rely heavily on the healthcare system, and may be reluctant to expand her knowledge.

Educated mothers are expected to have easier access to health information, understand it more easily, and better grasp the healthcare system. They are also likely to read more effectively, analyze complex health concepts, and apply this information to make more informed decisions. Educated mothers communicate more effectively within the healthcare system and have a better understanding of medical terminology, prescription instructions, and diagnostic procedures (21). As our study demonstrates, educated mothers may be better equipped to access, understand, and apply health information due to their improved digital literacy and enhanced cognitive abilities. Perhaps all of these factors contribute to health literacy.

In our study, we observed that parents with higher monthly incomes had better health literacy. Higher incomes facilitate access to higher levels of education, healthcare, and the use of digital technology (27,28). It is not surprising that the mothers in our study were more focused on health issues due to all these factors, and their health literacy levels were positively affected.

The epidermal barrier function is weakened in children with AD, and dryness is a critical problem. Strengthening the epidermal barrier and preventing dryness is therefore essential to treating all children diagnosed with AD. Regular daily use of moisturizers that do not cause contact dermatitis, are safe, and do not contain perfumes or preservatives should be recommended for every patient (29,30). In addition to increasing the skin's moisture level, moisturizers help reduce symptoms of AD, such as itching, redness, cracking, and thickening (29). In a cross-sectional survey-type study, most parents of children with AD reported that they did not use regular moisturizers (76.3%) and did not apply moisturizers to the whole body (75.8%) due to concerns about side effects (9). In our study, it was determined that 88% of the mothers used daily moisturizers regularly. Although there was no statistically significant relationship between health literacy and the use of a daily moisturizer, regular daily antihistamine, regular bath oil, or regular anti-allergic shampoo, a statistically significant positive correlation was found between the participants' health literacy scale score and their skin care knowledge level score. It was concluded that increasing parents' health literacy regarding moisturizers could provide more accurate skin care knowledge. High health literacy may enhance individuals' ability to comprehend, assess, and apply health-related information. Therefore, individuals with high health literacy may be more likely to learn about specific topics, such as skin care. They may also have a higher interest and motivation in personal health areas, such as skin care. Because health literacy is an individual's ability to perceive, understand, and use health-related information, a high level of this skill has a positive impact on skin care knowledge and practices. Therefore, a positive correlation is expected between health literacy scores and skin care knowledge levels.

The strongest aspect of our study is that it is one of the rare studies to measure families' health literacy on AD and knowledge of moisturizers. This study has several limitations that could potentially impact the generalizability of the results. The study was conducted in a single-center setting and covered a limited geographic area; therefore, the findings may not be directly generalizable to larger populations with diverse socio-cultural structures. The sample group did not have a homogeneous age distribution; there was no broad age range among the mothers. Furthermore, the study only assessed the health literacy of mothers of children with AD; no comparisons were made with a control group (e.g., mothers of healthy children). This shortcoming limits the ability to determine whether the observed findings are specifically related to the diagnosis of AD or the general role of motherhood. Because the parents of patients who were followed for at least four weeks were included in the study, the basic information given to the families about the use of moisturizers may have confounded the results. Because the data collection tools used in the study were self-report-based, the possibility of social desirability bias in participants' responses should be considered. Other family-related factors (number of children, the birth order of the child with AD, etc.) were not evaluated. Furthermore, the number of visits to our outpatient clinic was not assessed. These could potentially confound the results.

CONCLUSION

This study demonstrates that health literacy (HL) in mothers of children with AD is a complex and multifactorial construct, shaped by factors such as education level, age, and socioeconomic status. Our findings revealed that HL was significantly associated with practical knowledge related to AD skin care, particularly the use of moisturizers—but not with general disease knowledge or direct treatment behaviors. In practice, educational programs should be developed to enhance mothers' health literacy, specifically concerning skin care in children with AD. Moreover, access to information should be supported through digital platforms, instructional videos, and individualized counseling.

Mothers with high health literacy tend to acquire sufficient knowledge about skin care; however, this knowledge does not always translate into consistent and effective treatment practices. Bridging the gap between knowledge and behavior may reduce the severity of AD, lower the risk of complications, and improve children's quality of life.

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OpenAI Inc.) was used. The author generated all content, and no AI tool was involved in the creation of scientific data or interpretations.

Author Contributions

Concept: **Ahmet Kan, Sümeyye Güneş,** Design: **Ahmet Kan, Sümeyye Güneş,** Data collection or processing: **Sümeyye Güneş, Yahya Gül,** Analysis or Interpretation: **Ahmet Kan, Yahya Gül,** Literature search: **Sümeyye Güneş,** Writing: **Ahmet Kan, Sümeyye Güneş,** Approval: **All authors.**

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