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Popularity and efficacy of complementary and alternative medicine in managing atopic dermatitis in Saudi Arabia

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Abstract

Introduction: Atopic dermatitis (AD) or eczema is a common inflammatory skin condition in Saudi Arabia, impacting adults with a varying prevalence. Previous research in the Aseer province has indicated that a significant proportion of dermatological patients resort to complementary and alternative medicine (CAM) to treat AD.

Objective: To investigate the nature, prevalence, and influence of CAM usage among Saudi adults with AD.

Methods: This cross-sectional study utilized an electronic survey distributed to Saudi adults through social media platforms and included adults diagnosed with AD for over a year.

Results: Our study included 163 participants with atopic dermatitis; 73.6% were females, 57.7% were aged 18–24, and 65.0% were from the Central region. Most participants were single (63.2%), students (47.2%), and had a monthly income < 5000 SAR (69.3%). CAM usage was prevalent (62%), with 36.8% reporting positive effects. Gauze moistened with warm water and olive oil was the most common remedy (16.4%). Motivations for CAM usage included dissatisfaction with medical drugs (55.8%). Logistic regression revealed significant factors for CAM usage, including the impact of AD on quality of life (regression coefficient/beta coefficient [B] = 0.618, p = 0.005, odds ratio/Exp[B] = 1.856) and the belief in CAM for treating skin diseases (B = 1.282, p = 0.001, Exp[B] = 3.604).

Conclusion: Our study on AD in Saudi participants revealed a prevalence of CAM usage, notably gauze moistened with warm water. Various factors, including the impact of AD on quality of life and belief in CAM for treating skin diseases, significantly

influence CAM usage.

Keywords: Complementary medicine; Eczema; Herbal medicine; Prevalence; Olive oil; Sidr

1. Introduction

Atopic dermatitis (AD) is a chronic inflammatory skin condition characterized by skin dryness and recurrent flares of erythematous, eczematous lesions and severe itching, thus impacting individuals' quality of life (QoL) globally.[1] AD usually presents on the cheeks in infants and skin folds of the extremities in older children. In adults, AD can occur at non-classic locations, complicating the diagnostic process. The pathogenesis of AD involves compromised skin barrier function due to mutations in the filaggrin gene, leading to increased transepidermal water loss. Immune system dysregulation is another important part of AD pathogenesis, highlighting its systemic nature.[2,3] The prevalence of AD ranges from 2.1% to 4.9% worldwide, with a significant impact observed in Saudi Arabia, affecting 6–13% of adults across various regions.[4,5] COVID-19 led to an increase in the incidence of several allergic and inflammatory diseases, mainly atopic ones.[6] Treatment goals for AD focus on restoring the functionality of the epidermal barrier with the use of occlusive and/or humectant moisturizers. During flare-ups, the main goal of treatment is to reduce skin inflammation with anti-inflammatory treatments.[7] Patients with AD are advised to use emollients generously and incorporate soap-free cleansers into their daily shower routine to support therapy. It is important to avoid harsh cleansers and long baths that may exacerbate skin dryness. In cases of flare-ups, topical corticosteroids serve as the primary anti-inflammatory treatment modality. When initial treatments prove inadequate, ultraviolet (UV) phototherapy stands out as an effective and safe alternative.[8] Unfortunately, UV phototherapy is not always as effective in AD management as it is for psoriasis. Immunodepressors, such as methotrexate and ciclosporin, are sometimes used to treat severe or resistant cases of AD. Recently, biological treatments, including dupilumab and JAK inhibitors, have demonstrated superior effectiveness and safety compared to older treatment options. The burden of AD extends beyond physical symptoms, encompassing significant financial costs and diminished QoL for both patients and their caregivers. The burden of AD also extends to affect society and the healthcare system. AD can even alter activeness and concentration in school-aged and preschool children, highlighting the importance of early, effective treatment and management from a young age.[9] Given the potential adverse effects of conventional therapies and the suboptimal response to prescribed medications, individuals often turn to complementary and alternative therapies for relief. The chronic nature of the disease and corticophobia are key factors driving people to seek alternative, non-medicated treatments.[10]

Complementary and alternative medicine (CAM) refers to healthcare practices that fall outside the scope of conventional medical therapy.[11] Herbal treatments, probiotics, diet, biofilm, borage oil, swimming, acupuncture, manual therapy or manipulation, thermal waters, phototherapy, and spiritual and religious practices are some forms of commonly utilized CAMs.[12,13] Globally, the prevalence of CAM usage ranges from 5% to 74.8%.[14] Notably, in Saudi Arabia, 40% of patients in dermatology outpatient clinics seek CAM to treat their dermatologic conditions.[15] Despite the limited evidence supporting the efficacy of CAM for AD, the substantial number of patients seeking alternative treatments underscores the importance of healthcare professionals being well-versed in non-traditional approaches to managing skin conditions.[16,17] A study conducted in the Aseer province revealed that over 50% of dermatological patients utilize CAM.[18] Our present research focuses on the nature and prevalence of CAM utilization among Saudi adults with AD, exploring the commonly employed CAM modalities and their impact on patients with AD.

The present study was designed to comprehensively assess the prevalence, patterns, and underlying motivations for the use of CAM among individuals diagnosed with AD in Saudi Arabia. We established several specific objectives for the present study, as follows: (i) to thoroughly investigate the nature and prevalence of CAM practices among patients diagnosed with AD in Saudi Arabia; (ii) to identify and categorize the specific types and forms of CAM that are commonly utilized by individuals with AD within the Saudi population; and (iii) to assess and evaluate the perceived and/or measurable impact of CAM usage on AD patients.

2. Methods

2.1. Study design

This study employed a pre-validated questionnaire for a cross-sectional survey.[18] An online questionnaire was developed using Google Forms to collect data for this study. The survey was distributed broadly across various social media platforms (Telegram, WhatsApp, and Facebook) to reach a broad segment of the population within Saudi Arabia. Initially, the questionnaire was prepared in English to ensure clarity and structure, after which it was carefully translated into Arabic to enhance accessibility and ensure comprehension among Arabic-speaking participants. The translation process aimed to preserve the accuracy and intent of the original content while making it culturally and linguistically appropriate for the target population.

2.2. Sample size and study population

Based on data provided by the General Authority for Statistics in Saudi Arabia,[19] the estimated population of Saudi Arabia is 32,175,224. To achieve reliable results, the study aimed to obtain a minimum target sample size of 385 individuals, utilizing a non-probability convenience sampling approach.

Participants were selected based on the following inclusion criteria: (i) individuals who had been clinically diagnosed with AD and are currently residing in Saudi Arabia; (ii) aged 18 years or older with a confirmed diagnosis of AD for a minimum duration of one year at the time of the study; (iii) voluntarily agreed to participate in the study after being informed about its purpose and procedures; and (iv) fully completed and submitted the online questionnaire, providing all required responses necessary for data analysis. The exclusion criteria were individuals without a clear or confirmed diagnosis of AD made by a qualified medical professional, and individuals who were under the age of 18 at the time of the study.

2.3. Data collection

Participants completed an anonymous electronic survey on the use of complementary and alternative medicines (CAMs). The developed survey included questions on the types of CAMs used, such as gauze moistened with warm water, Sidr, and olive oil, frequency and duration of CAM usage, reasons for use, and perceived effectiveness.

The survey was administered online via Google Forms to enhance participant convenience in completing the questionnaire. The survey encompassed two sections. Section 1 captured respondents' background and sociodemographic information, including age, gender, region, marital status, income, education level, and employment. Section 2 featured a set of nine items and was used to assess various aspects related to CAM usage for eczema, participant's experience and level of satisfaction, duration of eczema, QoL, and the type of CAMs used (gauze moistened with warm water, olive oil, Sidr, Dead Sea salt, honey, air freshness, aloe vera, borage oil, vaseline, chamomile, and green tea).

2.4. Ethical approval

Participation in the questionnaire was entirely voluntary, and individuals were under no obligation to take part in the study. All information collected was treated with strict confidentiality, and measures were taken to ensure the privacy and anonymity of each participant's data throughout the study. Prior to completing the questionnaire, participants were presented with a written introductory consent form that explained the purpose, objectives, and procedures of the study. After reviewing this information, participants were required to indicate their informed consent by selecting either a "Yes" or "No" response. Only those who chose "Yes" were permitted to proceed with the questionnaire, thereby confirming their voluntary agreement to participate in the study. Ethical approval was obtained from the Deanship of Scientific Research, King Khalid University, Saudi Arabia, on December 19, 2023 (approval number: ECM#2023-3310).

2.5. Statistical analysis

A comprehensive statistical analysis was performed on the collected dataset, incorporating both descriptive and inferential statistical techniques to ensure a robust examination of the study findings. Initially, descriptive statistics were employed to summarize and present the key demographic characteristics of the participants, such as age, gender, and other relevant variables. This preliminary analysis provided a clear and organized overview of the composition of the study population, allowing for a better understanding of the sample's general profile and aiding in the interpretation of subsequent results. The descriptive phase established a basis for further analysis by revealing patterns and distributions within the data. Subsequently, inferential analyses such as the binary logistic regression model were used to determine the adjusted predictors of CAM and doctor-prescribed medicine usage. Statistical significance was established at a p-value of 0.05 or lower and a 95% confidence interval. All statistical analyses are performed using SPSS statistical software (version 29.0.0; IBM, United States of America).

3. Results

Our study included 188 participants; 25 were excluded for being under 18 years old. Most participants were female

(73.6%, n = 120) and in the age group 18–24 years (57.7%, n = 94). Most participants were single (63.2%, n = 103) and held a Diploma/Bachelor's degree (77.3%, n = 126). The Central region had the highest representation (65.0%, n = 106). Employment status varied among participants, with most being students (47.2%, n = 77). A significant portion had a monthly income of <5000 SAR (69.3%, n = 113) (Table 1).

Table 1. Sociodemographic and other characteristics of participants (N = 163) assessed for complementary and alternative medicine usage

Characteristic	Frequency, n	Percentage (%)
Gender		
Female	120	73.6
Male	43	26.4
Age (years)		
18–24	94	57.7
25–44	46	28.2
45–65	23	14.1
Marital status		
Single	103	63.2
Married	54	33.1
Divorced/widowed	6	3.7
Educational status		
Secondary or below	33	20.2
Diploma/Bachelor's	126	77.3
Masters/PhD	4	2.5
Region		
North	8	4.9
West	11	6.7
East	15	9.2
South	23	14.1
Central	106	65.0
Employment status		
Unemployed	38	23.3
Government employee	24	14.7
Private employee	24	14.7
Student	77	47.2
Monthly income (SAR)		
<5,000	113	69.3
5,000–10,000	29	17.8
10,000–15,000	10	6.1
>15,000	11	6.7

Table 2 displays the prevalence of CAM usage, its efficacy in AD, and its associated effects among participants. The duration of eczema varied among participants, with 40.5% (n = 66) experiencing it for over seven years. A significant portion (42.9%, n = 70) acknowledged that eczema had little effect on their QoL. The majority of participants (43.6%, n = 71) used medicines prescribed by doctors, while 38.7% (n = 63) integrated CAMs with prescribed medicines, and 23.3% (n = 38) used CAMs after stopping prescribed medicines. Positive effects were reported by 36.8% of participants (n = 60) after using CAMs. Notably, 49.7% of participants believed that CAMs are used specifically for skin problems (n = 81). Recommendations for CAM usage primarily came from relatives/family (53.4%, n = 87).

Figure 1 highlights the various CAMs used by participants for eczema/AD. The most reported treatment is gauze moistened with warm water and olive oil (16.4%), followed closely by Sidr (12.7%) and Dead Sea salt (12.1%). Other notable treatments include honey (9.4%), air freshness (7.5%), aloe vera/borage oil (6.3%), Ratanjot (*Alkanna tinctoria*) (6.3%), spiritual/religious water (6.3%), and vaseline (5%). Lesser-used remedies include chamomile (4.4%), green tea (3.1%), cream from attar (2.5%), starch (1.9%), and others (5.9%).

Figure 2 reveals the motivations for CAM usage to treat eczema/AD: 55.8% cited unsatisfactory results from medical drugs, 45.3% feared cortisone complications, 28.5% opted for cost-effectiveness, 25.7% believed in the efficacy of CAMs, 20.8% considered religious/cultural beliefs, and 19.1% switched due to side effects from prescribed medications.

Table 3 displays the factors influencing the use of CAMs for eczema among participants. From the table, gender does not significantly impact CAM usage (regression coefficient/beta coefficient [B] = 0.408, p = 0.387), indicating no strong gender-related trend. Age exhibits a marginally insignificant effect (B = 0.726, p = 0.091), suggesting that older participants may be more inclined to use CAMs. Marital status (being married) exhibits a non-significant negative influence (B = -0.450, p = 0.388, odds ratio/Exp[B] = 0.637), implying marital status could not reliably predict CAM usage. Education level, occupation, and high monthly income do not significantly affect CAM usage. Eczema duration over seven years has a non-significant positive effect (B = 0.209, p = 0.213, Exp[B] = 1.233), indicating a slight tendency for longer eczema duration to be associated with higher CAM usage. The most influential factors are eczema's significant impact on QoL (B = 0.618, p = 0.005, Exp[B] = 1.856) and the belief that CAMs are used for skin diseases (B = 1.282, p = 0.001, Exp[B] = 3.604). These significant findings suggest that

individuals experiencing a substantial impact on their QoL and those perceiving CAMs as suitable for skin diseases are more likely to use CAMs for eczema.

Table 2. Prevalence and efficacy of complementary and alternative medicine use for atopic dermatitis (*N* = 163)

Survey category	Frequency, *n*	Percentage (%)
How long you have had eczema?		
<1 year	29	17.8
1–5 years	31	19.0
5–7 years	37	22.7
>7 years	66	40.5
Does eczema affect your quality of life?		
No	29	17.8
Yes (little)	70	42.9
Yes (often)	42	25.8
Yes (a lot)	6	3.7
Yes (significant)	16	9.8
Do you use the medicine prescribed by your doctor?		
No	36	22.1
Sometimes	56	34.4
Yes	71	43.6
Have you ever used complementary or alternative medicine as a treatment for eczema?		
No	62	38.0
Yes (used alongside prescribed medicine)	63	38.7
Yes (stopped prescribed medicine and used alternative medicine)	38	23.3
Results noticed after using complementary or alternative medicine		
No change noticed	48	29.4
Negative/unsatisfactory	7	4.3
Positive/satisfactory	60	36.8
Did not use complementary or alternative medicine	48	29.4

(*cont'd...*)

Table 2. (*Continued*)

Survey category	Frequency, *n*	Percentage (%)
Do you think complementary or alternative medicine is specifically used for skin problems?		
No	82	50.3
Yes	81	49.7
Where do you get recommendations to use complementary or alternative medicine?		
No recommendations/I do not use complementary or alternative medicine	50	30.7
Communication websites	13	8.0
Friends	13	8.0
Relatives/family	87	53.4

Table 4 presents the results of a logistic regression model, exploring factors influencing the usage of doctor-prescribed medicines for eczema among participants. Gender does not significantly impact prescription medicine usage (B = −0.308, p = 0.531), with an odds ratio of 0.735, suggesting no substantial gender-related trend. Similarly, age exhibits a non-significant negative effect (B = −0.605, p = 0.161, Exp[B] = 0.546), indicating that older participants are not significantly less likely to use doctor-prescribed medicines. Marital status has a non-significant positive influence (B = 0.225, p = 0.657, Exp[B] = 1.252), suggesting no strong association between being married and increased use of prescribed medicines. The region of residence displays marginal insignificance (B = 0.295, p = 0.064, Exp[B] = 1.343), hinting at a potential regional influence on prescription medicine usage. Occupation, high monthly income, eczema duration, and its impact on QoL do not significantly affect the use of doctor-prescribed medicines. Interestingly, the belief in CAMs for skin diseases also does not significantly influence prescription medicine usage (B = −0.222, p = 0.618, Exp[B] = 0.801).

4. Discussion

Atopic dermatitis (AD), a chronic and relapsing inflammatory skin condition, is recognized as a prevalent health issue in Saudi Arabia among both adult and pediatric populations. This condition not only causes physical discomfort but also significantly affects QoL due to its persistent symptoms, including itching, redness,

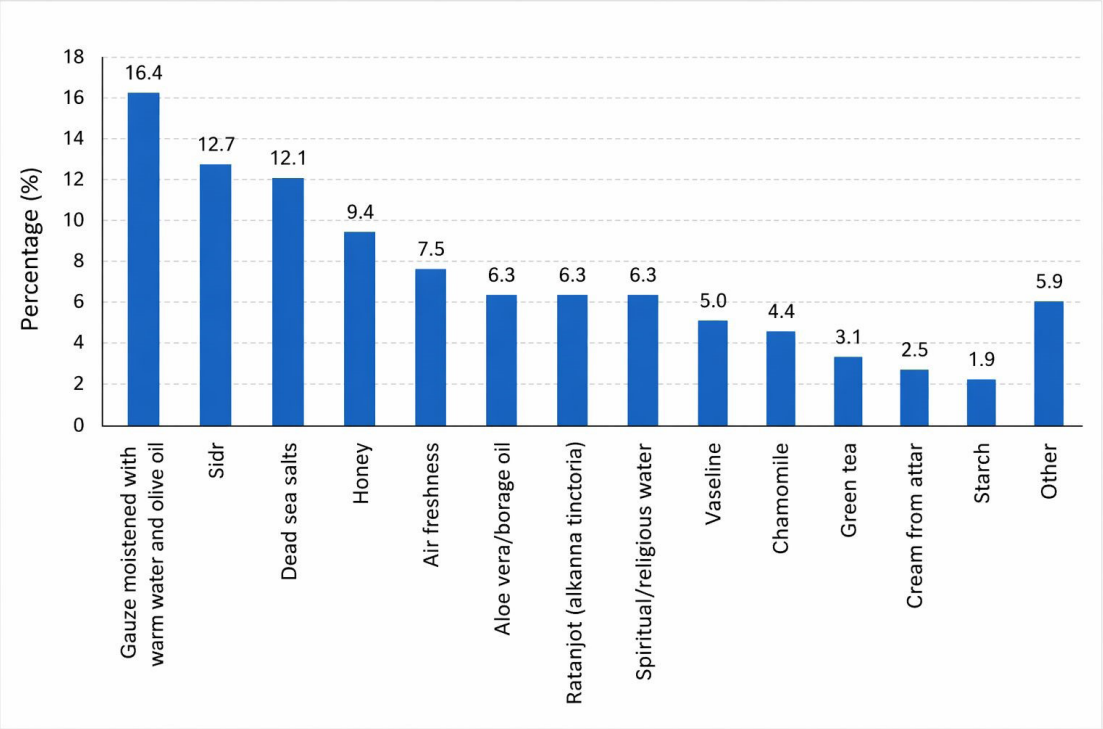

Figure 1. Different complementary and alternative medicines used by the participants for eczema/atopic dermatitis

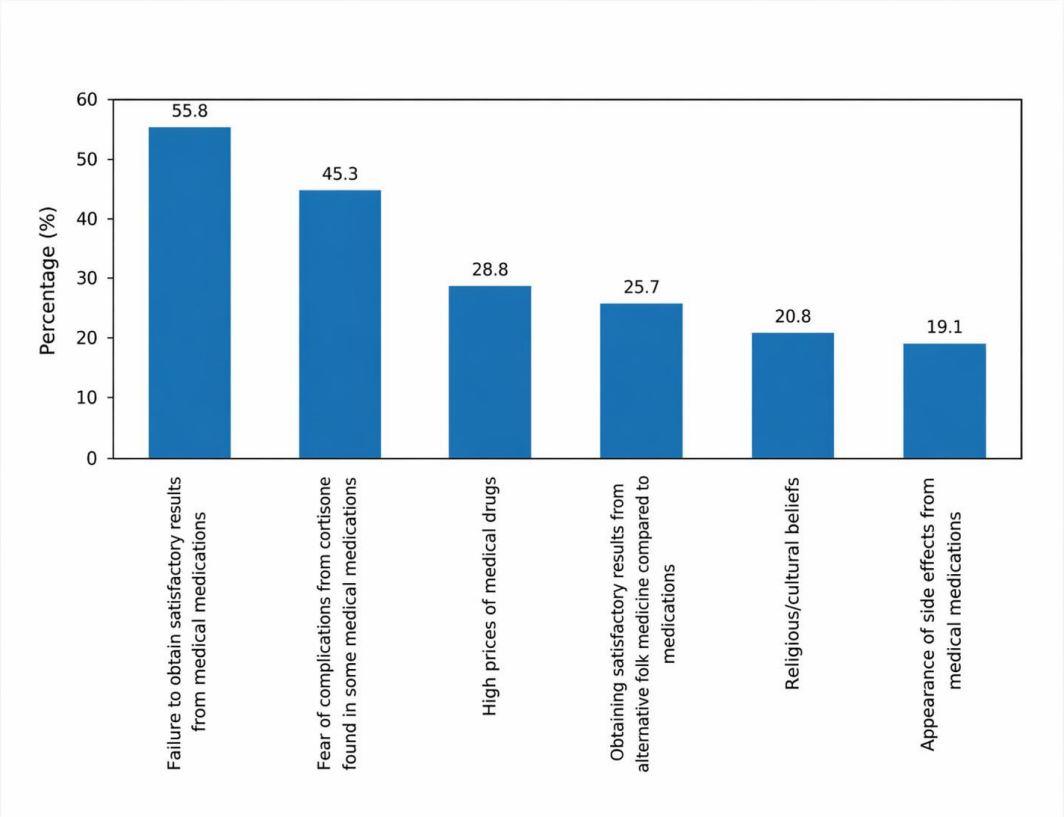

Figure 2. Different reasons/motivations for complementary and alternative medicine usage

Table 3. Characteristics of participants using complementary and alternative medicine for eczema

Characteristic	B	*p*-value	Exp(B)	95% CI	
				Lower	Upper
Gender (male)	0.408	0.387	1.503	0.597	3.787
Age (18–24 vs. ≥25 years)	0.726	0.091	2.067	0.891	4.796
Marital status (married)	−0.450	0.388	0.637	0.229	1.772
High education level (Diploma/Bachelor's vs. Others)	0.098	0.828	1.103	0.456	2.667
Occupation (student)	−0.002	0.993	0.998	0.668	1.492
High monthly income (SR <5,000 vs. SR ≥5,000)	−0.227	0.376	0.797	0.483	1.317
Eczema (>7 years)	0.209	0.213	1.233	0.887	1.714
Eczema effect on quality of life (significant)	0.618	0.005*	1.856	1.204	2.859
Use of prescribed medicine by doctors (yes)	−0.010	0.969	0.990	0.597	1.642
Complementary and alternative medicines are used for skin diseases (yes)	1.282	0.001*	3.604	1.709	7.602
Constant	−1.923	0.221	0.146	-	-

Notes: Constant refers to the intercept of the logistic regression model. It is the predicted value of the outcome when all independent variables (predictors) are equal to zero, or when all categorical variables are at their reference category. *$p < 0.05$.
Abbreviations: B: Regression coefficient/beta coefficient; Exp(B): Exponentiated B/odds ratio; CI: Confidence interval.

Table 4. Characteristics of participants using doctor-prescribed medicines for eczema

Characteristic	B	*p*-value	Exp(B)	95% CI	
				Lower	Upper
Gender (male)	−0.308	0.531	0.735	0.281	1.926
Age (18–24 vs. ≥25 years)	−0.605	0.161	0.546	0.234	1.272
Marital status (married)	0.225	0.657	1.252	0.464	3.381
Region (all)	0.295	0.064	1.343	0.983	1.836
Occupation (student)	−0.034	0.941	0.967	0.391	2.387
High monthly income (SR < 5,000 vs. SR ≥ 5,000)	−0.436	0.093	0.647	0.389	1.076
Eczema (>7 years)	0.453	0.169	1.573	0.824	3.001
Eczema effect on quality of life (significant)	−0.027	0.881	0.973	0.681	1.390
Use of prescribed medicine by doctors (yes)	0.376	0.093	1.456	0.940	2.255
Complementary and alternative medicines are used for skin diseases (yes)	−0.222	0.618	0.801	0.335	1.913
Constant	1.195	0.520	3.303	-	-

Notes: Constant refers to the intercept of the logistic regression model. It is the predicted value of the outcome when all independent variables (predictors) are equal to zero, or when all categorical variables are at their reference category. *$p < 0.05$.
Abbreviations: B: Regression coefficient/beta coefficient; Exp(B): Exponentiated B/odds ratio; CI: Confidence interval.

and skin irritation. The high prevalence of AD within the nation highlights its public health relevance and mirrors global trends, where the condition is increasingly being acknowledged as a widespread dermatological concern. Fatani *et al.*[20] highlighted that AD is a chronic inflammatory skin disease, affecting 5–10% of adults globally, with a prevalence of 6–13% in Saudi Arabia. CAM is used by more than half of dermatology patients in the province of Aseer.[18] Our study aimed to explore CAM prevalence, effects, and common usage patterns in the Saudi population with AD for comprehensive insights.

Notably, the demographic profile of the participants reveals key characteristics that may influence CAM utilization. The majority being female (73.6%) and in the age group of 18–24 years (57.7%) aligns with existing literature suggesting a higher prevalence of AD in young females. Similarly, Johansson *et al.*[21] revealed that the 12-month prevalence of AD was 17.8%, and more females than males had AD (20.5% vs. 14.8%, $p < 0.0001$). Moreover, the predominance of participants with a Diploma/Bachelor's degree (77.3%) and from the Central region (65.0%) indicates potential socio-cultural and educational factors impacting healthcare decisions.

Moreover, there is a diverse landscape of CAM usage. The extended duration of eczema (40.5% experiencing it for more than seven years) underscores the chronic nature of the condition. Similarly, Abuabara *et al.*[22] demonstrated the chronic, recurring nature of AD with symptom intensity fluctuations. AD is typically diagnosed in childhood but can onset at any age. Notably, 43.6% of participants used medicines prescribed by doctors, while 38.7% integrated CAM with prescribed ones, demonstrating a significant dual approach to AD treatment and a multidisciplinary approach in severe cases. Boguniewicz *et al.*[23] indicated that a multidisciplinary approach is needed to comprehensively evaluate triggers and responses to treatment, address confounding factors (including sleep disruption), and educate patients and caregivers. The positive effects reported by 36.8% of participants after using CAM emphasize the perceived efficacy of CAM in managing AD. However, Schäfer *et al.*[24] implied that there was inadequate evidence to assess the efficacy of different CAM techniques, such as acupuncture, homeopathy, and salt baths, in managing AD.

Our study also provides a detailed overview of the specific CAM modalities employed by participants. Gauze moistened with warm water and olive oil is the most commonly reported treatment (16.4%). This approach aligns with traditional practices and cultural remedies often integrated into CAM approaches. Similarly, Galli *et al.*[25] reported that different CAM techniques for AD (e.g., dressing or wet-wrap therapy) involve applying topical medication and bandaging with moistened and dry gauze layers after a warm bath. The usage of Sidr (12.7%) and Dead Sea salts (12.1%) reflects the diverse nature of alternative treatments embraced by participants. Schiffner *et al.*[26] highlighted that Dead Sea salt is especially recommended for patients with chronic AD due to its high compliance and suitability for those with sufficient time for therapy.

There are various motivations driving participants to opt for CAM. Most participants cited unsatisfactory results from medical drugs (55.8%), indicating persistent challenges in finding effective conventional treatments. Fear of cortisone complications (45.3%) and cost-effectiveness (28.5%) further elucidate the complex decision-making process individuals undergo when opting for CAM. Similarly, Koo *et al.*[27] indicated that topical corticosteroids (TCS) and emollients effectively treat atopic eczema during exacerbations. Concerns about long-term TCS use and fear of its complications lead to the use of CAMs.

Our study also explores factors influencing the usage of CAMs. Gender, age, marital status, education level, occupation, and high monthly income do not significantly affect CAM usage. However, a longer duration of eczema (>7 years) has a non-significant positive effect, suggesting a slight tendency for longer eczema duration to be associated with higher CAM usage. However, Khan *et al.*[28] described that patients with eczema had 69% higher odds of using CAM than those without eczema, aligning with our findings that long duration of eczema is associated with higher odds of CAM use. The most influential factors are the significant impact of eczema on QoL and the belief that CAMs are used for skin diseases. A study by Tangkiatkumjai *et al.*[29] revealed that various factors, such as internal health control influences in the West, social networks in Asia, and affordability, access, and traditions in Africa, had an impact on CAM usage. These findings suggest that individuals experiencing a substantial impact on QoL and those perceiving CAMs as suitable for skin diseases are more likely to use alternative treatments for eczema. It is reassuring that creams with unknown ingredients were used by only 2.5% of the participants. A recent study from Saudi Arabia has reported that these creams are mostly colonized by multidrug-resistant bacteria and might have metallic content exceeding the allowed limits.[30]

In examining the factors that influence the utilization of doctor-prescribed medications among individuals with AD, the analysis revealed that certain demographic variables—namely, gender, age, and marital status—do not exert a statistically significant effect on the likelihood of using prescribed medications. Similarly, socioeconomic

status, duration of eczema condition, and an individual's reported QoL were also found to have no significant impact on the use of prescribed medications. Furthermore, cultural beliefs, particularly the trust or belief in the effectiveness of CAMs for treating skin diseases, did not appear to alter the usage of doctor-prescribed medications. This suggests that belief in alternative therapies does not necessarily deter individuals from following conventional medical treatment regimens. Interestingly, while the region of residence did not exhibit a statistically significant association with prescription medicine use, its marginal insignificance may point to subtle regional differences or emerging trends in treatment practices across different areas of Saudi Arabia. These observations warrant further investigation to better understand any nuanced geographic influences that may exist.

This study is subject to several limitations that should be carefully considered when interpreting the findings. Firstly, the voluntary nature of participant recruitment may introduce selection bias, as individuals who chose to participate may differ systematically from those who did not, thereby affecting the generalizability of the results to the broader population. Secondly, the reliance on self-reported data holds the inherent risk of recall bias, where participants may inaccurately remember or misreport their experiences, particularly in relation to their use of CAMs and associated outcomes. Furthermore, the cross-sectional design of the study limits the ability to establish temporal relationships or draw causal inferences between CAM use and observed health outcomes in individuals with AD. Another limitation lies in the geographical scope of the research; as the study was conducted exclusively within Saudi Arabia, the findings may not apply to populations in other countries or cultural contexts. Cultural beliefs, practices, and societal norms specific to the region may also influence how participants perceive and report their use of CAMs, potentially introducing cultural bias into the data. Lastly, the study did not include a longitudinal component or long-term follow-up, which restricts the ability to assess the sustained effectiveness or long-term outcomes of CAM treatments over time. For future studies, it would be interesting to assess the participants to confirm the diagnosis and conduct follow-ups after CAM use to evaluate the safety and efficacy of these complementary treatments. Diagnosis of AD is not always accurate, as several diseases might be misdiagnosed as AD, including psoriasis, contact dermatitis, tinea, dermatitis herpetiformis, and mycosis fungoides. Future studies could also explore the development and evaluation of machine learning artificial intelligence (AI) models for diagnosing AD based on clinical, dermoscopic, and histologic images. While such models have already been developed for distinguishing benign and malignant skin tumors,[31,32] applying them to inflammatory diseases may present greater challenges.

5. Conclusion

Our study comprehensively assessed CAM usage by individuals with AD in different regions of Saudi Arabia. Our findings revealed a widespread use of CAMs among the Saudi population, with one of the most frequently reported practices being the application of gauze soaked in warm water and olive oil. The analysis indicated that AD effects on an individual's QoL played a significant role in the decision to use CAMs. Additionally, a strong belief in the effectiveness of CAMs for skin conditions was also a key factor influencing the adoption of such practices.

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Conflict of interest

The authors declare they have no competing interests.

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Ethics approval and consent to participate

Ethical approval was obtained from the Deanship of Scientific Research, King Khalid University, on December

19, 2023 (approval no. ECM#2023-3310). Participation in the questionnaire was voluntary. Each participant was asked to provide written informed consent before answering the survey.

Consent for publication

Participation in the questionnaire was voluntary. Each participant was asked to provide written informed consent before answering the survey.

Availability of data

All data are published in the manuscript. Additional data are available upon request from the corresponding author.

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