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The Cost of Relief: Financial and Educational Impacts on Atopic Dermatitis Care

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Abstract

Atopic Dermatitis (AD) affects those of all ages and demographics. AD is known to be cumbersome and financially taxing, significantly affecting patients' quality of life (QoL). The purpose of this study is to assess the financial implications across various socioeconomic backgrounds and community types from the patient perspective within a single institution in the Southeastern U.S. A cross-sectional survey was administered to those ≥18 years old diagnosed with AD. Patients self-reported information on their socioeconomic status (SES), education level, affordability, expenses related to their AD, and factors affecting their QoL. In our cohort of sixty-four patients, we found that one in five patients have been unable to afford treatment at some point. This finding is not confined to the lowest income group, but rather all groups have experienced affordability difficulty. It is clinically significant that patients chose financial burden, transportation and access to medical care as one of their top three factors that decreased their QoL. We also found that the understanding of disease and treatment options may not be based on education level. Understanding the socioeconomic impact of disease facilitates better resource allocation and knowledge of how we can better serve the evolving patient population.

Introduction

Atopic Dermatitis (AD) is a chronic, pruritic inflammatory cutaneous disease that affects people of all ages and demographics. AD affects over 30 million people in the United States[1]. The prevalence of AD among U.S. adults was recently found to be 10.2%[2]. In 2015, the cost of AD in the United States was conservatively estimated to be $5.3 billion annually[3]. Some of the costs involved in AD include clinic visits, hospitalizations, prescription medications, transportation, and lost income due to work absences and diminished productivity.

AD is notorious to be cumbersome and financially taxing, significantly affecting patients' quality of life (QoL). QoL includes the patient's financial burden, symptom management, and overall satisfaction with treatment. Recent studies reveal a great burden of AD in adults either due to disease persistence or adult-onset disease[4]. As disease prevalence increases and new therapies arise, a better understanding of the socioeconomic burden becomes critical. Understanding the socioeconomic impact of disease facilitates better resource allocation and knowledge of how we can better serve the evolving patient population. The objective of this study is to assess the financial implications across various socioeconomic backgrounds and community types from the patient perspective within a single institution in the Southeastern U.S. that serves rural, suburban, and urban areas.

Methods

This study received approval from the University of Alabama at Birmingham's Institutional Review Board. A 22-question cross-sectional survey was conducted via telephone calls. Inclusion criteria included patients ≥18 years old with an ICD code for AD seen at the University of Alabama at Birmingham over the past 10 years. Patients were adults of varying ages, genders, races, and ethnicities. Verbal consent was obtained. Data was securely stored in REDCap, a HIPAA-compliant database. Patients self-reported information on their AD diagnosis, socioeconomic status (SES), education level, affordability, expenses related to their AD, and various factors affecting their QoL. Statistical analysis was performed using SPSS.

Results

Out of the 82 patients contacted by telephone, 64 consented and completed the survey, resulting in a response rate of 78%. The cohort had an average age of 41 years, with a nearly equal gender distribution (55% female, n=35). The majority of participants identified as Caucasian/White (48%, n=31) or African American / Black (36%, n=23). Most respondents lived in suburban (55%, n=35), followed by urban (28%, n=18) and rural (17%, n=11) communities. The average household size was three. Educational attainment was split among high school/GED/some college (50%, n=32), undergraduate degree (28%, n=18), and postgraduate degree (22%, n=14). Among 47 respondents, household income was less than $50,000 (32%, n=15), $50,000–100,000 (19%, n=9), $100,000–150,000 (21%, n=10), and more than $150,000 (28%, n=13). The demographics of the cohort are detailed in Table 1.

When asked questions related to the financial aspects of care, thirteen respondents (21%) reported having been unable to afford their medications at some point. Only three of these individuals had household incomes below $50,000 per year. Among the fifteen individuals within this income group, their residential locations were evenly distributed (five rural, five suburban, five urban).

When asked to identify the most expensive aspects of their AD care, most responded over-the-counter (OTC) treatments and supplies (36%), such as emollients, bandages, and itch relievers. This was followed by clinic visit co-pays (23%), prescription co-pays (17%), travel expenses (11%), and income lost from work absences (8%). Three respondents did not have current expenses related to their AD (5%). These results were then stratified by income group and shown in Table 2.

Financial expenses for each income level did not differ significantly between groups (p=0.33). Among participants earning less than $50,000 annually, OTC treatments and supplies (40%, n=6) and travel expenses (27%, n=4) were

Table 1: Cohort Demographics

Cohort Description	N=64
Age (mean)	41 (SD 19.8, IQR 24-57)
Gender	
Male	29 (45%)
Female	35 (55%)
Race	
Caucasian or White	31 (48%)
Black or African American	23 (36%)
Asian	10 (16%)
Ethnicity	
Hispanic or Latino	4 (6%)
Non-Hispanic or Latino	60 (64%)
Residential Community Type	
Urban	18 (28%)
Suburban	35 (55%)
Rural	11 (17%)
Number of Individuals living in household (mean)	3 (SD 1.7, IQR 2-4)
Highest Level of Education	
High School, GED, or Some College	32 (50%)
Undergraduate Degree (Associate or Bachelors)	18 (28%)
Post Graduate Degree of Any Kind	14 (22%)
Estimated Household Income Per Year	**N=47**
< $50,000	15 (32%)
$50,000-100,000	9 (19%)
$100,000-150,000	10 (21%)
>$150,000+	13 (28%)

[a] Abbreviations: GED, General Educational Development

Table 2: Greatest perceived financial expenses based on income level

Income	OTC Treatments and Supplies	Clinic Visit Copays	Prescription Copays	Travel Expenses	Work Absences
<$50,000 (n=15)	6 (40%)	2 (13%)	0 (0%)	4 (27%)	3 (20%)
$50,000-100,000 (n=9)	5 (56%)	2 (22%)	2 (22%)	0 (0%)	0 (0%)
$100,000-150,000 (n=10)	2 (20%)	4 (40%)	3 (30%)	1 (10%)	0 (0%)
>$150,000 (n=13)	5 (39%)	3 (23%)	2 (15%)	2 (15%)	1 (8%)
Student or declined to report income (n=14)	5 (35%)	4 (29%)	4 (29%)	0 (0%)	1 (7%)

[a] % reflects the proportion of expenses reported within a specific income subgroup

the most common financial concerns, followed by work absences (20%, n=3). In the $50,000–100,000 income group, OTC expenses were also the most frequently reported (56%, n=5), followed by clinic visits and prescription copays (22%, n=2 each). In the $100,000–150,000 income group, respondents reported a higher prevalence of clinic visit copays (40%, n=4) and prescription copays (30%, n=3), with fewer concerns related to travel and OTC treatments and supplies. For those earning over $150,000, OTC treatments (39%, n=5) and clinic visit copays (23%, n=3) were the most frequent financial burdens. Finally, students or individuals who declined to report income most commonly identified OTC expenses (35%, n=5), clinic visit copays (29%, n=4), and prescription copays (29%, n=4) as financial concerns. Notably, travel expenses and work absences were infrequently reported across all income groups except the lowest-income bracket.

In addition, those from a rural location did not report travel expenses at increased frequency compared to other expenses (p=0.19). In terms of performance at work or school, income level was associated with perceived decreased performance due to AD (p=0.55), but 70% of those in the income range of $100,000-150,000 stated their performance had been impacted. Regarding environmental influences on AD, 38% of those in the highest income range ($150,000+) reported environmental factors worsening their symptoms, more than other groups.

In terms of education, all respondents had at least a high school degree or high school equivalency. Half of the participants held either an undergraduate degree (bachelors or associates) (28%, n=18) or a post-graduate degree (22%, n=14). When asked about their understanding of their disease and treatment options, the majority (81%) reported that they almost or completely understood their condition and available treatments. Among those who reported little to no understanding of their disease and treatment options, there was no significant difference based on education level (p=0.45). Figure 1 illustrates patients' perception of their understanding of AD in relation to their education level.

Across all education levels, the majority of patients reported high levels of understanding. Patients with a college degree reported the highest understanding (nearly

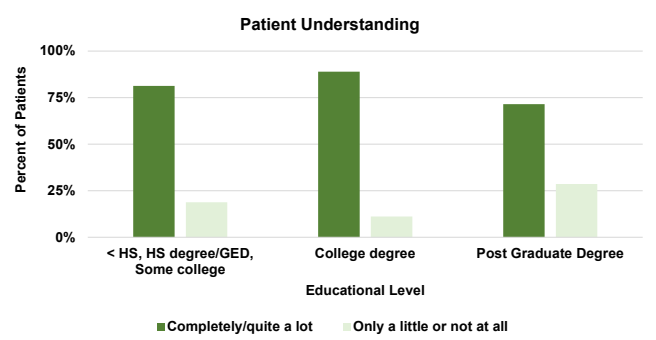

Figure 1. Patients' perceptions of their AD understanding according to education level. This graph illustrates the percentage of patients reporting their level of understanding based on their highest level of education.

90%). Those with a postgraduate degree reported slightly lower complete understanding (~70%) and a higher percentage of limited understanding (~30%) than those with college degrees. Surprisingly, patients with lower educational attainment report higher understanding (~80%) than those with postgraduate degrees, though not as high as those with a college degree. Furthermore, most patients (89%) reported that their doctor explained information related to their AD in a way they could understand.

When asked to choose their top three biggest factors that decreased their QoL due to AD, fourteen respondents chose finances, five chose transportation, five chose access to medical care, and two chose access to supplies. These selections did not significantly differ among different income groups. Interestingly, from the rural group, only two chose transportation as a top three factor, and none chose access to care or supplies. Figure 2 displays the QoL factors distribution based on each residential category.

Among participants who identified financial burden as a top three factor decreasing their QoL, most were urban residents (50%, n=7), followed by suburban residents (43%, n=6) then rural residents (7%, n=1). Transportation barriers were identified equally by rural and suburban residents (40%, n=2 each), while urban respondents reported slightly less difficulty in this domain (20%, n=1). Challenges in accessing medical care were highest among urban participants (60%, n=3), followed by suburban

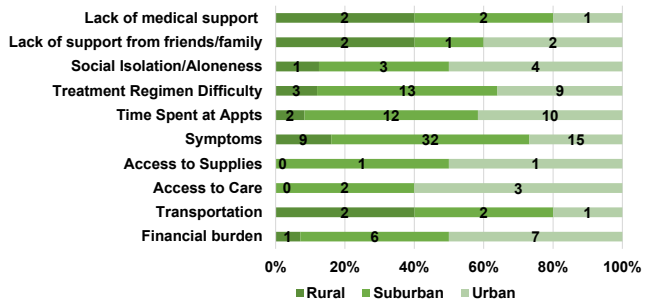

Figure 2. Percentage distribution of selected factors decreasing QoL by residential community type. This graph displays the reported factors that negatively impact QoL among patients, categorized by community type. The percentages represent the proportion of individuals within each residential geographic group (rural, suburban, urban) who indicated a particular factor as decreasing their QoL. This visual schematic is intended to highlight the relative burden of each factor within community types. For example, among those who reported lack of medical support, 40% were rural, 40% were suburban, and 20% were urban.
[a] Abbreviations: Appts, Appointments

residents (40%, n=2); rural participants did not report access to care as a significant issue. Similarly, concerns related to access to medical supplies were noted only by suburban and urban respondents (50%, n=1 each), with no reports from rural communities.

Discussion

Our study found that one in five patients have been unable to afford treatment at some point. This finding is not confined to the lowest income group but rather all groups have experienced affordability difficulty. This finding may be due to patients being unable to afford treatment at a past point in their life. However, it may be warranted for clinicians to avoid assumptions related to the need for financial assistance. For example, for middle-class individuals, the cost of medications can be a significant barrier to treatment. Despite earning above the poverty line, many in the middle class face a financial squeeze. High insurance premiums, co-pays, and deductibles often make medications unaffordable, especially for those with multiple chronic conditions.

Notably, 14 patients stated that financial burden was one of their top three factors that decreased their QoL. In 2010, the estimated out-of-pocket cost in the treatment of AD in the US was $37.8 million[2]. On average, eczema treatment sustained higher out-of-pocket costs than hypertension and diabetes[1]. There are direct and indirect costs that contribute to the financial burden in AD.

Direct costs include clinic visits, transportation to and from clinic visits, prescription medications (topical steroids, biologics), OTC treatments, and hospitalizations[4]. A recent study performed on National Eczema Association members found that US individuals spend an average of $600 annually on out-of-pocket costs, with some spending more than $1,000[5]. Out-of-pocket costs include co-pays, prescriptions, nonprescription products (moisturizers, hygiene products, allergy medications, itch relivers), complementary approaches (cleaning products, clothing, bedding), alternative medications (naturopathic medicine), and adjunctive therapies (acupuncture, yoga)[5]. Some respondents spent up to $100 on specialized laundry and household cleaners, and specialized clothing[5]. In terms of direct costs, our study found that 36% of respondents identified OTC treatments and supplies as the most expensive component of their AD care, followed by clinic visit co-pays (23%) and prescription co-pays (17%). Additionally, two respondents chose access to supplies as one of their top three factors that decreased their QoL.

Indirect or hidden costs include lost income due to work absences for appointments or symptoms, diminished productivity, loss of employment due to inability to perform, and reduced QoL[4]. One study found that employees with AD were more likely to take five or more days off work as compared to employees without AD[4]. In 2012, eczema was associated with over 68 million days of lost work[2]. In terms of indirect costs, our study found that 11% of respondents identified travel expenses as the most expensive component of their AD care, followed by income lost from work absences (8%).

Furthermore, 70% of participants in the $100,000–150,000 income group reported decreased performance at work or school, suggesting a notable impact from presenteeism. Prior research has shown that AD can significantly impair productivity and lead to long-term career consequences[6]. Expanding assessments to include these indirect costs could provide a more accurate picture of the total burden of AD, particularly among those who remain employed despite ongoing symptoms.

Moreover, insurance coverage for OTC treatments and access to financial assistance programs are important policy considerations in AD care. OTC moisturizers are essential for disease management, yet most Medicaid programs do not cover them, creating a financial burden that may affect adherence[7]. One study estimated that the out-of-pocket annual cost of OTC moisturizers can be prohibitive, especially for families with limited income, and emphasized that removing these financial barriers could improve adherence and reduce long-term healthcare costs[7]. To bridge these gaps, organizations like the National Eczema Association offer financial aid resources, and The Assistance Fund recently launched a copay assistance program to support patients with AD-related out-of-pocket costs[8,9]. These efforts highlight the need for more inclusive insurance policies to improve treatment access.

This cohort brings unique perspectives in that the institution provides care for many rural areas and surrounding states in the Southern U.S. Many patients travel long distances to receive AD follow-up at a care center in an urban location. Due to the national shortage of dermatologists, patients must travel further to receive care outside of their home community, leading to large time investments, work absences, lost income, and high travel costs for patients[10].

It is clinically significant that five patients chose transportation and five chose access to medical care as one of their top three factors that decreased their QoL (Fig. 2). These findings suggest that QoL related to finances, transportation, and access concerns vary meaningfully across residential community types.

Urban residents appear to experience greater financial burden compared to residents of other communities, which may be attributed to higher healthcare costs, limited insurance coverage, or elevated living expenses in urban environments. Despite their proximity to healthcare facilities, urban participants also reported more difficulty accessing medical care, potentially reflecting systemic issues such as provider shortages or administrative barriers. In contrast, transportation emerged as a more prominent concern for rural and suburban residents, likely due to greater geographic distances and limited public transit options. The lack of reported difficulties in access to care and supplies among rural respondents may indicate under-recognition of these barriers, different care expectations, or alternative resource networks.

These patterns underscore the importance of addressing the unique structural and systemic challenges faced by different communities when developing strategies to improve QoL. Expanding access to include telehealth options could help address disparities in AD care, particularly for those in underserved or rural areas.

Moreover, it is important to note that the understanding of disease and treatment options may not be based on education level (Fig. 1). This non-linear relationship suggests that while formal education generally supports better health comprehension, individuals with postgraduate education may possess a heightened awareness of medical complexity or may hold themselves to higher standards of understanding. Conversely, patients with less formal education may perceive a higher level of understanding than they actually possess, potentially due to limited exposure to medical terminology.

Additionally, a dynamic that may affect this includes health literacy independent of societal education level. Health literacy is the ability of individuals to obtain and understand basic health information and services needed to make appropriate health decisions[11]. Low health literacy is associated with more emergency visits, less primary care visits, more hospitalizations, worse health outcomes, decreased interpretation of medication labels, high mortality, and higher healthcare costs[12,13]. Further research may be needed to examine the connection between educational level and health literacy in our patient population. Understanding this relationship can help guide the development of targeted resources that meet patients where they are.

To support patients with varying educational backgrounds, health literacy interventions, such as visual aids and simplified materials, can be especially helpful. For example, visual-based education has been shown to significantly improve health knowledge and engagement, particularly in patients with limited literacy skills[14]. Studies recommend that patient materials be written at a 5th–6th grade reading level and include illustrations to make content easier to understand[15]. Additionally, it is important to tailor health communication strategies not only to educational attainment but also to patients' self-perceived understanding. Incorporating these strategies into clinical practice may help improve disease understanding, treatment adherence, and overall QoL for patients.

There are some limitations in this study. First, all participants in this study achieved at least a high school education or GED equivalent. Therefore, this study does not contain information from patients who did not finish primary education and thus may not reflect the entire AD population. Another limitation is that our institution utilizes a clinical pharmacist to assist patients with obtaining medications, including biologics. This may not demonstrate the entire population of those who are unable to obtain treatment due to insurance coverage or less resources. Lastly, our small sample size limits our data and may not be reflective of the population. A larger sample size may be necessary to gain statistical significance.

Further research may be needed to demonstrate associations between income level and affordability of treatments, missed treatments and education level, and educational level and treatment regimen difficulty. Additional studies may be necessary to accurately assess patients' understanding of their disease and treatment options. Improved patient counseling may be useful for enhanced outcomes across education levels.

Conclusions

Overall, this study highlights the financial and educational challenges faced by patients with AD and underscores the complexity of these factors in their impact on patients' QoL. Notably, affordability difficulties were reported across all income groups, emphasizing the need for clinicians to avoid assumptions about financial barriers based solely on SES. While most patients responded having

a strong understanding of their condition and treatment options, further efforts to assess their understanding are needed. Also, providing patient education and counseling across various educational levels could enhance treatment adherence and outcomes.

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Conflicts of Interest

Dr. Mayo has received grants and/or personal fees from Pfizer, Abbvie, Arcutis, Bodewell, Janssen, Lilly, Leo Novartis, Physicians' Education Resource, Union Chimique Belge, Leo Pharma, Acelyrin, Galderma, Bristol Myers Squibb, Procter & Gamble, and ChemoCentryx. Dr. Mayo has also received non-financial support from the Association of Clinical Research Professionals, Southeastern Consortium for Dermatology, Skin of Color Society, and the Journal of the American Academy of Dermatology. All authors declare no other relationships or activities that could influence the submitted work.

Abbreviations

AD: Atopic Dermatitis

QoL: Quality of Life

SES: Socioeconomic status

OTC: Over-the-counter

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