# Psychological Distress and Quality of Life in a Community-Based Population with Atopic Dermatitis

Florence Mei Fung Wong *, Crystal Pui Ka Fung, Karen Hoi Yan Mak, Richard Yi Tsun Kao

Posted Date: 23 December 2025

doi: 10.20944/preprints202512.2098.v1

Keywords: atopic dermatitis; anxiety; depression; quality of life

 doi:10.20944/preprints202512.2098.v1



*Article*

# Psychological Distress and Quality of Life in a Community-Based Population with Atopic Dermatitis

**Florence MF Wong [1,*], Crystal PK Fung [2], Karen HY Mak [2] and Richard YT Kao [2]**

[1] Tung Wah College; florencewong@twc.edu.hk
[2] The University of Hong Kong
* Correspondence: florencewong@twc.edu.hk; Tel.: (852) 3468-6838

## Highlights

**What are the main findings?**

- People with atopic dermatitis experience higher psychological distress and poorer quality of life.
- Their psychological distress had significant negative association with quality of life .

**What are the implications of the main findings?**

- Population with atopic dermatitis are experiencing physical and psychological distress.
- Strategies should be developed to tackle not only physical burden but also psychological distress.

## Abstract

**Background/Objectives**: Atopic dermatitis (AD) is a chronic inflammatory skin condition associated with psychological distress and diminished quality of life (QoL). The complex interplay between anxiety, depression, and multidimensional QoL in adults with AD remains insufficiently understood. This study aimed to examine the relationships and key predictors linking psychological distress and QoL in this population. **Methods**: In this cross-sectional study, 47 AD participants completed the Hospital Anxiety and Depression Scale (HADS) and World Health Organization Quality of Life (WHOQOL-BREF). Bivariate and multivariate analyses identified associations and predictors among anxiety, depression, and QoL domains. **Results**: Elevated anxiety (7.91 ± 3.27) and depression (6.28 ± 3.62) scores were observed, with moderate-to-poor QoL across all domains. Anxiety and depression were negatively correlated with all QoL dimensions ($p < 0.05$). Depression and stress predicted poorer self-perceived QoL ($p < 0.001$), and inadequate sleep was associated with lower environmental QoL ($p = 0.006$). Higher AD episode frequency correlated with reduced psychological QoL ($p = 0.007$). **Conclusions**: This study highlighted the substantial psychological burden and impaired QoL experienced by adults with AD, with depression, stress, and sleep quality serving as key modifiable factors. Integrated care addressing both physical and psychological factors is recommended to improve outcomes in this population. Future research should prioritize longitudinal designs and AD-specific assessments to further elucidate causal pathways and inform targeted interventions.

**Keywords:** atopic dermatitis; anxiety; depression; quality of life

## 1. Introduction

Atopic dermatitis (AD) is a chronic, relapsing inflammatory skin disorder that affects individuals across the lifespan, with a particularly high prevalence among children and young adults [1,2]. The condition is characterized by a range of physical symptoms, including xerosis, erythematous papules and plaques, lichenification, and severe pruritus [2,3]. These manifestations

 doi:10.20944/preprints202512.2098.v1



often lead to significant physical discomfort and functional impairment, which in turn adversely affect psychological and social well-being, ultimately diminishing overall quality of life (QoL) [4].

Beyond its dermatological presentation, AD is increasingly recognized as a systemic condition with substantial psychosocial consequences. Evidence highlights that individuals with AD experience profound physical and psychological disturbances, including an elevated risk of anxiety, depression, and social isolation [2,3]. Systematic reviews reports that adults with AD are at significantly elevated risk for comorbid anxiety and depression, with prevalence estimates ranging from 20% to 30%, substantially higher than those observed in the general population [4–6]. The burden of AD extends further to include sleep disturbances, social withdrawal, stigmatization, and reduced health-related QoL across physical, psychological, social, and environmental domains [7,8]. This relationship is bidirectional; psychological distress can exacerbate pruritus and inflammation through neuroimmune pathways, while poorly controlled symptoms perpetuate emotional and social dysfunction [7–10]. Additional consequences such as reduced work productivity, impaired concentration, and even self-harm or suicidal ideation further compromise QoL [9–11].

The management of AD remains clinically challenging, often requiring prolonged, multifaceted treatment regimens involving topical therapies, systemic immunomodulators, and lifestyle modifications [12]. These interventions can be burdensome and are sometimes associated with side effects, which may further reduce QoL [3,10,13]. Visible skin lesions frequently contribute to social stigmatization, diminished self-esteem, avoidance of social and physical interactions, and impairments in academic or occupational functioning [13–15]. During flares, patients may increasingly withdraw from social activities and physical contact, intensifying feelings of isolation [16,17]. A case study of a patient with severe, uncontrolled AD highlighted not only persistent skin symptoms but also profound sleep disruption, psychosocial distress, and significant declines in academic and work performance.

Despite growing recognition of the interconnected physical and mental health impacts of AD, few studies have comprehensively examined the predictors and pathways linking psychological distress to multidimensional QoL in adults with the condition. Therefore, this study aims to 1) examine levels of anxiety, depression, and QoL in AD population, 2) explore associations between anxiety, depression, and QoL across physical, psychological, social, and environmental domains in AD population, 3) identify factors associated with anxiety, depression, and QoL outcomes in AD population.

## 2. Materials and Methods

### *2.1. Design*

A cross-sectional study was conducted.

### *2.2. Subject Recruitment and Settings*

Eligible participants were recruited from the community using convenience and snowball sampling methods to enhance subject accessibility.

#### 2.2.1. Selection Criteria

The inclusion criteria required participants to have a diagnosis of atopic dermatitis. Individuals with mental health conditions were excluded.

#### 2.2.2. Sample Size Calculation

The sample size was calculated based on an effect size of 0.39, derived from a previous study [16]. With a significance level of 0.05 and a desired power of 80%, a minimum of 46 participants was required.

### *2.3. Instruments*

#### 2.3.1. Demographics

 doi:10.20944/preprints202512.2098.v1



Demographic and AD-related medical characteristics, such as age, gender, body height, body weight, body mass index, types of atopic dermatitis/eczema, duration of atopic dermatitis/eczema, family history of atopic dermatitis/eczema, reasons for having atopic dermatitis/eczema, and current treatments, were collected as part of the study.

#### 2.3.2. The Chinese Version of the HADS

The Chinese version of the HADS will be utilized to assess anxiety and depression, which are commonly experienced psychological disturbances among individuals with chronic diseases. This instrument, validated by Leung et al. [17], comprises two major domains: anxiety (HADS-A) and depression (HADS-D). Each domain includes seven items rated on a 3-point Likert scale, ranging from 0 (never experiencing the symptom) to 3 (always experiencing the symptom), with total scores ranging from 0 to 21. Scores of ≥ 8 and ≥ 11 indicate borderline and abnormal levels of anxiety/depression, respectively. The instrument demonstrates good internal consistency, with Cronbach's alpha values of 0.81 and 0.74 for the anxiety and depression subscales, respectively, indicating high reliability. This instrument presents good reliability with Cronbach's alphas for anxiety, depression, and overall HADS at 0.765, 0.771, and 0.837 respectively.

#### 2.3.3. Hong Kong Chinese Version of the Shorter WHOQOL-BREF

The Hong Kong Chinese version of the shorter WHOQOL-BREF questionnaire was employed to evaluate quality of life in the study population. This self-reported instrument, validated by Leung et al. [18], comprises 24 items assessing four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and environment (8 items), as well as two individual items on overall quality of life and general health. Scoring is based on a 5-point Likert scale, with total scores ranging from 0 to 100 following WHO's scoring guidelines for the original WHOQOL-BREF. Higher scores indicate a better quality of life. The instrument demonstrates good reliability across all domains, with Cronbach's alpha values ranging from 0.73 to 0.83. The reliability of all domains are good with Cronbach's alphas ranging from 0.728 to 0.879.

### *2.4. Study Procedure*

After ethics approval was obtained, eligible participants were recruited with an explanation of the study's purpose and their role in the research. All subjects must sign an informed consent before data collection. Upon consenting by signing the informed consent form (Appendix 1), they were asked to complete a set of questionnaires, which include a demographic data form (Appendix 2), the Chinese version of the HADS (Appendix 3), and the Chinese version of the shorter WHOQOL-BREF (Appendix 4).

### *2.5. Data Analysis*

All statistical analyses were performed using IBM SPSS Statistics version 26. The distribution of continuous variables was assessed for normality using skewness statistics and normal Q-Q plots. Descriptive statistics will be used to summarize the demographic and clinical characteristics of the participants, as well as the outcome variables of psychological well-being and QoL. To explore associations between psychosocial well-being, QoL, and demographic characteristics, Chi-square tests, bivariate analyses, and one-way ANOVA were employed. All tests were two-sided, and statistical significance was defined as $p < 0.05$.

### *2.6. Ethical Considerations*

Ethical approval was obtained from the Research Ethics Committee of Tung Wah College. Eligible participants were fully informed of the study's purpose and their involvement. Written informed consent was obtained from all participants prior to data collection, which was conducted anonymously.

 doi:10.20944/preprints202512.2098.v1



## 3. Results

### *3.1. Demographic Characteristics*

Of 47 subjects, 59.6% was female. The mean age was 28.43 ± 9.30 years old. More than 50% were young people aged between 18 to 25 years old and 40.4% were between 26 to 35 years old. There were 39 out of 47 subjects (83.0%) had had AD more than 7 years and 21 subjects had longlasting AD. Regarding personal perspectives for causation of AD, weather (53.2%) and then stress (25.5%) were reported as the main triggering factor. Table 1 shows the details of demographic characteristics and AD-perceving factors.

**Table 1.** Demographic characteristics and AD-perceiving factors.

| | Frequency | Percentage |
|---|---|---|
| Gender | | |
| Male | 19 | 40.4 |
| Female | 28 | 59.6 |
| Age ranges (years old) | | |
| 18-25 | 24 | 51.1 |
| 26-35 | 19 | 40.4 |
| 36-45 | 1 | 2.1 |
| >45 | 3 | 6.4 |
| Educational level | | |
| Primary or lower | 0 | 0 |
| Secondary | 2 | 4.3 |
| Tertiary or higher | 45 | 95.7 |
| Years obtained eczema | | |
| ≤5 years | 6 | 12.6 |
| 6-≤10 years | 7 | 14.7 |
| >10 years | 34 | 72.7 |
| Eczema episode (per year) | | |
| <1 to 5 times | 19 | 40.4 |
| 6 to 10 times | 1 | 2.1 |
| 11 to 20 times | 4 | 8.5 |
| 21 to 30 times | 2 | 4.3 |
| >30 times | 21 | 44.7 |
| Related factors* | | |
| Stress | 25 | 25.5 |
| Weather | 25 | 53.2 |
| Allergy | 4 | 8.5 |
| Environment | 31 | 66.0 |
| Inadequate sleeping | 7 | 14.9 |

* The total percentage is not 100 because participants could choose multiple factors.

### *3.2. Anxiety, Depression, and QoL*

Among 47 participants with atopic dermatitis (AD), mean scores for anxiety and depression were 7.91 (SD=3.27) and 6.28 (SD=3.62), respectively. Based on the WHOQOL-BREF, the majority of participants reported moderate overall perceived QoL and general health. Domain-specific scores indicated predominantly moderate physical and psychological health. Social relationships and environmental health were rated as moderate to high.

**Table 1.** Quality of life based on WHOQOL-BREF (n=47).

| WHOQOL-BREF | Frequency | Percentage |
|---|---|---|
| Perceived QoL | | |

 doi:10.20944/preprints202512.2098.v1



| | | |
|---|---|---|
| 1 | 7 | 14.9 |
| 2 | 18 | 38.3 |
| 3 | 22 | 46.8 |
| Perceived health | | |
| 1 | 17 | 36.2 |
| 2 | 15 | 31.9 |
| 3 | 15 | 31.9 |
| Physical health | | |
| 1 | 3 | 6.4 |
| 2 | 34 | 72.3 |
| 3 | 10 | 21.3 |
| Psychological health | | |
| 1 | 5 | 10.6 |
| 2 | 37 | 78.7 |
| 3 | 5 | 10.6 |
| Social health | | |
| 1 | 0 | 0 |
| 2 | 26 | 55.3 |
| 3 | 21 | 44.7 |
| Environmental health | | |
| 1 | 0 | 0 |
| 2 | 25 | 53.2 |
| 3 | 22 | 46.8 |

1=low, 2=moderate, 3=high.

*3.3. Associations Between Anxiety, Depression, and QoL Domains*

Bivariate analyses revealed significant correlations between anxiety, depression, and various quality of life domains. Anxiety was negatively associated with self-perceived QoL ($r = -0.401, p = 0.005$), physical health ($r = -0.305, p = 0.037$), psychological health ($r = -0.314, p = 0.032$), social health ($r = -0.373, p = 0.010$), and environmental health ($r = -0.358, p = 0.014$), and positively associated with depression ($r = 0.533, p < 0.001$).

Depression was also negatively correlated with self-perceived QoL ($r = -0.647, p < 0.001$), self-perceived health ($r = -0.306, p = 0.037$), physical health ($r = -0.364, p = 0.012$), psychological health ($r = -0.412, p = 0.004$), social health ($r = -0.380, p = 0.008$), and environmental health ($r = -0.465, p < 0.001$), and positively correlated with anxiety ($r = 0.533, p < 0.001$).

Furthermore, strong intercorrelations were observed among all QoL domains, most reaching high statistical significance ($p < 0.001$).

*3.4. Predisposing Factors Associated with Anxiety, Depression, and QoL Domains*

Multivariate regression analyses identified several predictors for anxiety, depression, and QoL outcomes. Higher levels of anxiety significantly predicted greater depression ($B = 0.481, SE = 0.114, p < 0.001$), with the model explaining a significant proportion of variance [$F(1,45) = 17.822, p < 0.001$].

Conversely, depression was a significant predictor of higher anxiety ($B = 0.270, SE = 0.127, p = 0.040$), as well as poorer self-perceived QoL ($B = -0.098, SE = 0.020, p < 0.001$) and lower environmental QoL ($B = -1.888, SE = 0.776, p = 0.019$). The overall model was significant [$F(3,43) = 18.750, p < 0.001$].

Self-perceived QoL was adversely affected by depression, stress ($\mathrm{B} = -0.830, \mathrm{SE} = 0.216, \mathrm{p} < 0.001$), and allergy ($\mathrm{B} = -0.678, \mathrm{SE} = 0.330, \mathrm{p} = 0.046$), but positively influenced by better self-perceived health ($\mathrm{B} = 0.706, \mathrm{SE} = 0.129, \mathrm{p} < 0.001$), with the model being significant ($\mathrm{F}(4,42) = 18.935, \mathrm{p} < 0.001$).

 doi:10.20944/preprints202512.2098.v1



Self-perceived health was negatively associated with stress and allergy, and positively linked to self-perceived QoL, in a significant model ($F(3,43) = 13.192, p < 0.001$).

Environmental QoL showed a positive association with physical QoL ($B = 0.404, SE = 0.138, p = 0.005$), psychological QoL ($B = 0.421, SE = 0.114, p < 0.001$), and social QoL ($B = 0.442, SE = 0.133, p = 0.002$), but was negatively related to inadequate sleep ($B = -0.472, SE = 0.162, p = 0.006$) in a significant model ($F(3,43) = 9.321, p < 0.001$).

Psychological QoL was positively associated with environmental QoL and negatively with the frequency of atopic dermatitis episodes ($B = -0.068, SE = 0.024, p = 0.007$) ($F(2,44) = 10.987, p < 0.001$), while social QoL was positively related to environmental and physical QoL.

Detailed regression coefficients and significance values are provided in Table S2.

## 4. Discussion

This cross-sectional study examined psychological distress and QoL among adults with AD. The sample predominantly consisted of young adults (aged 18–35 years), a population of particular concern given the potential for AD to disrupt ongoing physical and psychosocial development [7]. A notable finding was that 72.7% of participants had lived with AD for over a decade, and more than half reported experiencing more than 10 AD episodes annually, with many exceeding 30 episodes. This high burden of chronic and recurrent disease was reflected in participants' self-rated health, which 63.8% described as moderate to poor. Commonly reported triggers for exacerbations included weather (53.2%), stress (25.5%), and other environmental factors, consistent with established psychosocial and climatic influences on AD activity [19,20].

The study population exhibited clinically relevant levels of anxiety (mean = 7.91) and depression (mean = 6.28). These scores may represent a "normalized high" baseline of psychological distress integrated into daily life, as most were not experiencing an active flare at assessment. Pruritus, a core symptom, is strongly linked to mental health disturbances, particularly depression, and can act as a persistent stressor even during quiescent periods [20–22]. Depressive symptoms may, in turn, impair self-management, reduce treatment adherence, and worsen disease control, creating a bidirectional cycle linking skin and mental health [7,22,23].

QoL was reported as moderate to poor across all measured domains. Chronic physical symptoms like pruritus, erythema, and skin damage interfere with daily activities, sleep, and consistent treatment use [26]. Even in remission, residual skin discomfort and altered integrity necessitate ongoing management. The psychological domain was notably impaired, likely due to the impact of visible lesions on body image, self-esteem, and emotional well-being [24–26]. This psychological burden can undermine social relationships by reducing satisfaction with interpersonal connections and limiting access to support [24,25], while also affecting self-management, work performance, and productivity [27]. Environmental health encompassing safety, accessibility, and social infrastructure, was also rated poorly, suggesting broader contextual factors compound daily challenges.

Bivariate analyses revealed strong intercorrelations among all QoL domains, along with significant negative associations between anxiety/depression and each domain. Depression showed particularly robust negative correlations with overall self-perceived QoL and physical, psychological, social, and environmental health. These findings underscore the pervasive impact of mood disturbances on multidimensional well-being in AD. The interconnectedness of QoL domains suggests that deterioration in one area—often beginning with physical discomfort—can propagate to others, highlighting the need for holistic intervention [28,29].

Multivariate regression identified several modifiable predictors of anxiety, depression, and QoL. Anxiety significantly predicted depression, and vice versa, supporting their close interplay in AD. Depression also predicted poorer self-perceived and environmental QoL. Self-perceived QoL was adversely influenced by depression, stress, and allergies, but positively associated with self-rated health [30,31]. Environmental QoL was positively linked to physical, psychological, and social QoL but negatively associated with inadequate sleep [19,26]. Furthermore, psychological QoL was

 doi:10.20944/preprints202512.2098.v1



negatively affected by AD episode frequency, emphasizing the cyclical relationship between disease activity and mental well-being [7].

These findings have important clinical implications. As physical symptoms, particularly pruritus, are primary drivers of distress and reduced QoL, optimizing symptom control should be a central therapeutic goal. Reducing physical discomfort may alleviate anxiety, potentially preventing or mitigating depression. Addressing sleep disturbances and stress is also crucial, as poor sleep was linked to lower environmental QoL and may exacerbate both mental health symptoms and AD frequency [18,19]. Environmental modifications, alongside psychosocial support, could help disrupt the itch–scratch–stress–flare cycle [7]. Recognizing the interrelated roles of self-perceived health, stress, and comorbidities, like allergy, is essential. Integrated care models combining dermatological treatment with psychological support, sleep hygiene education, and environmental counseling may be particularly beneficial. A multidimensional, patient-centered approach addressing physical, emotional, social, and environmental needs is recommended to improve overall well-being in this population.

This study has several limitations. Its cross-sectional design precludes causal inference. The use of generic measures (HADS for distress, WHOQOL-BREF for QoL) may not capture AD-specific concerns. Future research should employ longitudinal designs and validated AD-specific instruments to better understand distress and QoL trajectories over time.

## 5. Conclusions

This study has demonstrated a substantial burden of psychological distress and diminished QoL among individuals with AD, along with key associations and contributing factors. The findings indicate that adults with AD commonly report elevated levels of anxiety and depression, alongside moderate to poor QoL across physical, psychological, social, and environmental domains. The chronic and relapsing course of AD results in persistent physical symptoms, compromised skin integrity, and altered appearance, which collectively contribute to reduced psychological well-being, social engagement, and environmental satisfaction.

The identification of modifiable predictors, such as stress, inadequate sleep, comorbid allergies, and frequency of AD episodes, provides a foundation for developing targeted strategies to mitigate adverse outcomes and reinforce protective factors. These insights offer valuable guidance for healthcare policymakers, dermatologists, and mental health professionals in designing integrated, holistic care models that address both the dermatological and psychosocial dimensions of AD.

Future research should prioritize longitudinal designs and incorporate AD-specific assessment tools to better elucidate the dynamic relationship between disease activity and well-being over time. Additionally, advancing more effective medical treatments to reduce physical symptom burden remains essential for disrupting the cycle of symptom exacerbation and psychological distress, ultimately improving overall QoL in this population.

**Supplementary Materials:** The following supporting information can be downloaded at the website of this paper posted on Preprints.org, Table S1: Associations among HADS and QoL domains, Table S2 Predictors associated with anxiety, depression, and QoL domains.

**Author Contributions:** Conceptualization, F.W. and R.K.; methodology, F.W.; validation, F.W. and R.K.; formal analysis, F.W.; investigation, F.W.; resources, F.W.; data curation, F.W.; writing—original draft preparation, F.W.; writing—review and editing, F.W., C.F., K.M, and R.K.; visualization, F.W. and R.K.; supervision, F.W. and R.K.; project administration, F.W., C.F., and K.M. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** The study was conducted in accordance with the Declaration of Helsinki and approved by the Research Ethics Committee of Tung Wah College (protocol code REC2024220 and 3 October 2024).

 doi:10.20944/preprints202512.2098.v1



**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study. Written informed consent has been obtained from the subjects to publish this paper.

**Public Involvement Statement:** Guidance for Reporting Involvement of Patients and the Public Long Checklist was completed.

**Guidelines and Standards Statement:** This manuscript was drafted against the STROBE Checklist for a cross-sectional study. A complete list of reporting guidelines can be accessed via the equator network: https://www.equator-network.org/.

**Data Availability Statement:** The data presented in this study are available on request from the corresponding author. The data are not publicly available due to keep the confidentiality.

**Acknowledgments:** We thank Mr. Kelvin So of Anitch Limited for his crucial support in subject recruitment. His assistance was essential to the successful completion of this project.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Abbreviations

The following abbreviations are used in this manuscript:

| | |
|---|---|
| AD | Atopic Dermatitis |
| HADS | Multidisciplinary Digital Publishing Institute |
| QOL | Directory of open access journals |
| WHOQOL-BREF | World Health Organization Quality of Life |

## References

1. Chai, H.; Siu, W.S.; Ma, H.; Li, Y. Understanding Atopic Dermatitis: Pathophysiology and Management Strategies. *Biomolecules* **2025**, *15*, 1500. https://doi.org/10.3390/biom15111500
2. World Allergy Organization (WAO). *Global report on atopic dermatitis 2022*. **2022**. https://www.eczemacouncil.org/assets/docs/global-report-on-atopic-dermatitis-2022.pdf
3. Chovatiya R. Atopic dermatitis (Eczema). *JAMA*. **2023**; 329(3): 268. doi:10.1001/jama.2022.21457.
4. Cai XC; Wang SH; Wang CX; Liu L; Wang J; Shen YH; et al. Epidemiology of mental health comorbidity in patients with atopic dermatitis: an analysis of global trends from 1998 to 2022. *J Eur Acad Dermatol Venereol*. **2024**; 38(3): 496.
5. Patel KR; Immaneni S; Singam V; Rastogi S; Silverberg JI. Association between atopic dermatitis, depression, and suicidal ideation: a systematic review and meta-analysis. *J Am Acad Dermatol*. **2019**; 80(2): 402–410. doi: 10.1016/j.jaad.2018.08.063.
6. Silverberg JI. Comorbidities and the impact of atopic dermatitis. *Ann Allergy Asthma Immunol*. **2019**; 123(2): 144–151.
7. LeBovidge JS; Schneider LC. Depression and anxiety in patients with atopic dermatitis Recognizing and addressing mental health burden. *Ann Allergy Asthma Immunol*. **2025**; 134: 506-515. doi: 10.1016/j.anai.2025.02.017.
8. Ring J; Zink A; Arents BWM; Seitz IA; Mensing U; Schielein MC; Wettemann N; de Carlo G; Fink-Wagner A. Atopic eczema: burden of disease and individual suffering – results from a large EU study in adults. *J Eur Acad Dermatol Venereol*. **2019**; 33: 1331–1340. https://doi.org/10.1111/jdv.15634.
9. Silverberg JI; Gelfand JM; Margolis DJ; Boguniewicz M; Fonacier L; Grayson MH; Ong PY; Chiesa Fuxench ZC; Simpson EL. Symptoms and diagnosis of anxiety and depression in atopic dermatitis in U.S. adults. *Br J Dermatol*. **2019**; 181(3): 554–565. https://doi.org/10.1111/bjd.17683.
10. Ghio D; Greenwell K; Muller I; Roberts A; McNiven A; Santer M. Psychosocial needs of adolescents and young adults with eczema: A secondary analysis of qualitative data to inform a behavior change intervention. *Br J Health Psychol*. **2021**; 26(1): 214–231. https://doi.org/10.1111/bjhp.12467.

 doi:10.20944/preprints202512.2098.v1




11. Teasdale E; Muller I; Sivyer K; Ghio D; Greenwell K; Wilczynska S; Roberts A; Ridd MJ; Francis N; Yardley L; Thomas KS; Santer M. Views and experiences of managing eczema: systematic review and thematic synthesis of qualitative studies. *Br J Dermatol*. **2020**, 184 (4): 627–637. https://doi.org/10.1111/bjd.19299
12. Hartono SP; Chatrath S; Aktas O; et al. Interventions for anxiety and depression in patients with atopic dermatitis: a systematic review and meta-analysis. *Sci Rep*. **2024**; 14: 8844. https://doi.org/10.1038/s41598-024-59162-9.
13. Birdi G; Cooke R; Knibb RC. Impact of atopic dermatitis on quality of life in adults: a systematic review and meta-analysis. *Int J Dermatol*. **2020**; 59(4): e75–e91. https://doi.org/10.1111/ijd.14763.
14. Schwartzman G; Lei D; Ahmed A; Chavda R; Gabriel S; Silverberg JI. Association of adult atopic dermatitis severity with decreased physical activity: a cross-sectional study. *Dermatitis*. **2023**; 34(3): 218–223. DOI: 10.1097/DER.0000000000000921
15. Meltzer LJ; Flewelling KD; Jump S; Gyorkos E; White M; Hauk PJ. Impact of atopic dermatitis treatment on child and parent sleep, daytime functioning, and quality of life. *Ann Allergy Asthma Immunol*. **2020**; 124(4): 385–392. doi: 10.1016/j.anai.2019.12.024.
16. Langenbruch A; Andrees V; Scherer M; Augustin M. Healthcare of patients with atopic dermatitis by general practitioners - a nationwide survey in Germany. *J Dtsch Dermatol Ges*. **2024**; 22(12): 1620-1629. doi: 10.1111/ddg.15529.
17. Leung CM; Ho S; Kan CS; Hung CH; Chen CN. Evaluation of the Chinese version of the Hospital Anxiety and Depression Scale: A cross-cultural perspective. *Int J Psychosom*. **1993**; 40(1-4): 29–34.
18. Leung KF; Wong WW; Tay MSM; Chu MML; Ng SSW. Development and validation of the interview version of the Hong Kong Chinese WHOQOL-BREF. *Qual Life Res*. **2005**; 14(6): 1413–1419. https://doi.org/10.1007/s11136-004-4772-1.
19. Samynathan A; Fishbein AB; Abbott SM; Booster GD; Zee PC; Sheldon SH; Yosipovitch G; Silverberg JI. Assessment and management of sleep disturbances in atopic dermatitis: a review. *Dermatitis*. **2024**; 35(suppl 1): S7–S12. doi: 10.1089/derm.2023.0074.
20. Schonmann Y; Mansfield KE; Hayes JF; Abuabara K; Roberts A; Smeeth L; Langan SM. Atopic eczema in adulthood and risk of depression and anxiety: a population based cohort study. *J Allergy Clin Immunol Pract*. **2020**; 8(1): 248-257. doi: 10.1016/j.jaip.2019.08.030.
21. Chatrath S; Lei D; Yousaf M; Chavda R; Gabriel S; Silverberg JI. Longitudinal course and predictors of depressive symptoms in atopic dermatitis. *J Am Acad Dermatol*. **2022**; 87(3): 582–591. doi: 10.1016/j.jaad.2022.04.061
22. Johnson JK; Loiselle A; Chatrath S; Smith Begolka W. Patient and caregiver perspectives on the relationship between atopic dermatitis symptoms and mental health. *Dermatitis*. **2024**; 35(4): 386–391. doi: 10.1089/derm.2023.0365.
23. Cheng BT; Silverberg JI. Depression and psychological distress in US adults with atopic dermatitis. *Ann Allergy Asthma Immunol*. **2019**; 123(2): 179–185. doi: 10.1016/j.anai.2019.06.002.
24. Kage P; Simon JC; Treudler R. Atopic dermatitis and psychosocial comorbidities. *J Dtsch Dermatol Ges*. **2020**; 18(2): 93–102.
25. Polaskey MT; Chovatiya R. Moving beyond biology: the critical role of social and structural determinants in atopic dermatitis. *Int J Dermatol.* **2025**; 64(2): 272–281. doi: 10.1111/ijd.17491
26. Esposito M; Amicucci G; Salfi F; Pellegrini C; De Berardinis A; Chiricozzi A; Peris K; Tempesta D; Ferrara M; Fargnoli MC. Exploring the interplay of atopic dermatitis severity with sleep and mental health: a case-control study in adult patients. *Postgrad Med*. **2024**; 136(5): 533-540. doi: 10.1080/00325481.2024.2366162.
27. Chan TC; Lin YC; Cho YT; Tang CH; Chu CY. Impact of Atopic Dermatitis on Work and Activity Impairment in Taiwan. *Acta Derm Venereol.* **2021**; 101(9): adv00556. https://doi.org/10.2340/00015555-3918.
28. Yardley L; Morrison L; Bradbury K; Muller I. The person-based approach to intervention development: application to digital health-related behavior change interventions. *J Med Internet Res*. **2015**; 17(1): e30. https://doi.org/10.2196/jmir.4055.
29. Mirchandaney R; Barete R; Asarnow LD. Moderators of cognitive behavioral treatment for insomnia on depression and anxiety outcomes. *Curr Psychiatry Rep*. **2022**; 24(2): 121–128. doi: 10.1007/s11920-022-01326-3.

 doi:10.20944/preprints202512.2098.v1



30. Bashyam AM; Ganguli S; Mahajan P; Feldman SR. Lifelong Impact of Severe Atopic Dermatitis on Quality of Life: A Case Report. *Dermatol Ther (Heidelb)*. **2021**; 11(3): 1065-1070. doi: 10.1007/s13555-021-00515-x.
31. Chatrath S; Lei D; Yousaf M; Chavda R; Gabriel S; Silverberg JI. Longitudinal course and predictors of depressive symptoms in atopic dermatitis. *J Am Acad Dermatol.* **2022**; 87(3): 582–591. https://doi.org/10.1016/j.jaad.2022.04.061.