

# The impact of childhood atopic dermatitis on quality of life of the paediatric population in Jeddah, Saudi Arabia

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## RESEARCH

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## ABSTRACT

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### Background

Atopic Dermatitis (AD) is a chronic skin condition characterized by pruritis which presents with xerosis, lichenification, and the eruption of eczematous lesions.

### Aims

To measure the quality of life in the paediatric population with atopic dermatitis at King Abdulaziz Medical City in Jeddah, Saudi Arabia.

### Methods

The assessment tool utilized was the Infants' Dermatitis Quality of Life Index (IDQOL) questionnaire which is validated and available in Arabic. The sample size is 80 participants. Demographics, history of atopy, current treatment, and the percentage of body involved were described as frequencies. Chi-square test was performed to determine if there was a significant difference between gender, age group and the presence of other atopic disease in comparison to percentages of body involved. The analysis

of the questionnaire's items was done by One-way ANOVA to determine where significant impact on quality of life was present.

### Results

There was a significant difference in overall IDQOL score between patient who had asthma with AD and those who did not ( $p=0.016$ ). Significantly, the higher the percentage of body area affected by AD, the higher IDQOL score ( $p<0.0001$ ). No significant difference was identified for the chi-square test. Among questionnaire's items sleep disturbance was affected the most among patients in relation to increase in distribution of disease along the body ( $p<0.0001$ ).

### Conclusion

The study concluded that the IDQOL among paediatric population with Atopic Dermatitis was significantly impaired, and it showed that the disease severity was proportionally related to the impairment of patients' quality of life. Therefore, we highly recommend further studies in the same field to be able to generalize the results in the Saudi paediatric population.

### Key Words

Infantile atopic dermatitis, quality of life, paediatric dermatology

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### What this study adds:

#### 1. What is known about this subject?

Atopic dermatitis has a major effect on various aspects of the paediatric population when compared to their healthy peers.

#### 2. What new information is offered in this study?

Atopic dermatitis remains to be one of the predictors of poor quality of life with a negative impact on paediatric population in Saudi Arabia.

### 3. What are the implications for research, policy, or practice?

We highly recommend further studies in the same field to be able to generalize the results in the Saudi paediatric population.

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## Background

Atopic Dermatitis (AD) is a chronic skin condition characterized by pruritic inflammation commonly in the cheeks, arms, or legs.<sup>1</sup> The aetiology of atopic dermatitis remains idiopathic, it has been described as being multifactorial. According to the National Eczema Association, genetics play a critical role. To illustrate, if a single parent had Atopic Dermatitis, Hay fever, or Asthma then the child has a 50 per cent chance of developing either one of the three aforementioned diseases. Atopic Dermatitis classically presents before the child reaches the age of five, yet it can also present later in life in adolescence or even adulthood. The disease has a relapsing remitting course with flare ups. The condition typically but not necessarily remits as the child progresses in age.<sup>2</sup>

Atopic dermatitis is one of the most common chronic skin conditions worldwide. The global prevalence of AD ranges from 15–20 per cent in children and 1-3 per cent in adults.<sup>3</sup> A study conducted in Jeddah, Saudi Arabia quantified the local prevalence of Atopic Dermatitis among children to be 21.6 per cent. Moreover, the research has identified that locally the disease usually presents before two years of age and mostly involves the antecubital region. The most commonly reported complain of AD was itchy skin. Pruritis associated with AD usually has a significant impact on the patients' lives with the disease even interfering with sleep.<sup>4</sup>

Throughout the years, several published studies aimed to define the magnitude of the impact Atopic Dermatitis postulated on the patients' quality of life. In 2019, a study conducted by Chan Ho Na concluded that AD impacts childhood to a greater extent than any other cutaneous diseases.<sup>5</sup> Only a single study assessing the impact of AD on quality of life of children in Buraidah was published during 2014. The study demonstrated that AD impaired the Quality of life of Saudi children severely. The research correlated that a greater impact on the quality of life was proportionate and correlated to the degree of the disease's severity.<sup>6</sup>

The aim of this study is to highlight the magnitude of impact Atopic Dermatitis has on the quality of life of children up to four years of age. Also, the research provides a more updated insight on the severity of the disease's impact

among patients in an urban city of Saudi Arabia.

## Method

This was a cross-sectional study that conducted at King Abdulaziz Medical City, Jeddah, Saudi Arabia. All patients aged  $\leq 4$  years and diagnosed with AD in an outpatient setting from January, 2019 to September, 2020 were enrolled. Patients who lost follow-up with the clinic and patients whose parents refused to answer the IDQOL questionnaire were excluded from the study. This study's protocol was approved by the International Review board of King Abdullah International Medical Research Center (KAIMRC) and informed consent from each patient was obtained.

Initially, baseline data of the enrolled patients were collected. This data included gender, age group, the presence of any other atopic disease, percentage of the body affected by the condition, and current treatment.

The assessment tool utilized was the Infants' Dermatitis Quality of Life Index (IDQOL) questionnaire which was designed for infants with atopic dermatitis below the age of four years. IDQOL was developed by Cardiff University and an approval to use a validated Arabic version was obtained from the institution prior to the initiation of the research. The questionnaire evaluated the caregiver's subjective perception of the child's condition in the past week, pruritis, mood, sleep quality, effect of condition on daily activity, and side effect of medication if any. Ten questions in the IDQOL were scored in a scale from 0 to 4 each, with 0 translating to not present and 4 being extremely affected. The higher the score in each question, the poorer the quality of life.

Nominal data were expressed with percentages, and numerical data were expressed using means and standard deviations. Internal consistency was measured using Cronbach's alpha. The difference between two-categories or three-categories nominal variables based of IDQOL score was determined using independent-sample t-test and One-way ANOVA, respectively. Chi-square test was conducted to identify any difference between two nominal variables. A 95 per cent confidence interval was used with statistical significance cutoff of  $p < 0.05$ .

## Results

The study included a total sample size of 80 subjects who were diagnosed with atopic dermatitis at King Khalid National Guard Hospital, Jeddah. The construct "quality of life", consisted of ten questions. The scale had an

acceptable level of internal consistency, as determined by a Cronbach's alpha of at 0.776.

Table 1 demonstrates patients' baseline data with the corresponding overall IDQOL score. The statistics excluded 1 patient (1.3 per cent) had both allergic rhinitis and asthma, 2 patients (2.5 per cent) had allergic conjunctivitis and asthma, and 2 other patients (2.5 per cent) had allergic rhinitis, allergic conjunctivitis, and asthma. The majority of the enrolled patients were using both moisturizers and topical steroids (48.8 per cent). There was a significant difference in overall IDQOL score between patient who had asthma with AD and those who did not ( $p=0.016$ ); patients with asthma and AD had poorer quality of life. Significantly, the higher the percentage of body area affected by AD, the higher IDQOL score ( $p<0.0001$ ).

In Table 2, Chi-square test was performed to determine if there was a significant difference between gender, age group and the presence of other atopic disease in comparison to percentages of body involved. No significant difference was identified.

The analysis of the questionnaire's items was done by One-way ANOVA to determine where significant impact on quality of life was present. Table 3 shows Mean and standard deviation ( $\pm$ SD) of each item in IDQOL in correspondence to the percentage of the body involved in the enrolled subjects. Sleep disturbance was affected the most among patients in relation to increase in distribution of disease along the body ( $p<0.0001$ )

## Discussion

This study prevailed the magnitude of the effect of Atopic Dermatitis weighs on the quality of life of children up to four years of age. In total, the study included a sample size with equal distribution across both genders. An Arabic validated version of the IDQoL index was used in this study, a questionnaire completed by parents to assess the impact of Atopic dermatitis on patients' QoL. The symptoms of AD in addition to patients' mood, sleep, dressing, and daily activities were inquired.<sup>7</sup>

In a local study that was conducted by Abolfotouh et al. to assess burden of various dermatological conditions. The study used Skindex-16 scale to assess the QoL of 283 patients with skin diseases. It showed that Atopic dermatitis was associated with the highest score in terms of impact on life. Additionally, a recent research published in 2019 estimated that patients with Atopic dermatitis had the third highest dermatology life quality index (DLQI). A higher DLQI

represents a lower quality of life as the number to quantify each entity impacted by the disease is marked higher. In another study done in Buraidah, Alzolibani AA reported data from 630 patients with Atopic Dermatitis who completed the IDQoL score. The study displayed that Atopic Dermatitis had quite a negative impact on the QoL of Saudi children along with their families.<sup>6</sup> The total IDQoL score was found to be 12.3. Similarly, the results in this study are consistent with the previous data available in the literature in context of ascertaining the severe impact the condition has on the patients' life. However, in this study the total IDQoL score was found to be 15.52, and it was higher than results reported previously.<sup>6,7,11</sup> The reason behind this may be attributed to our study including a large number of patients with a more severe pattern of Atopic Dermatitis.

Atopic Dermatitis was classified as mild, moderate or severe depending on the percentage of body area affected by the disease.<sup>10</sup> In accordance to the finding of Alzolibani, the impairment of patients' QoL was directly proportional to the disease severity. Similarly, our study did not expose a significant gender difference in IDQoL score. However, this study showed a significant difference in overall IDQOL score between patient who had asthma with AD and those who did not; patients with asthma and Atopic Dermatitis had poorer quality of life.<sup>6</sup> No a significant age group difference in IDQoL score was identified in this study. In contrast with these findings, a recent study was published during 2019 showed that the QoL of children was most impaired in the age group 5–9 years. "Sleep disturbance," "itching and scratching," and "discomfort while dressing" were respectively found to be the highest scored negative factors on patients' QoL. However, "problems from treatment" was the lowest scored factor. Similarly, a study conducted by Chan Ho Na concluded that sleep disturbance has been reported in 60 per cent of children suffering from AD and the percentage increases to 83 per cent during flare ups.<sup>5</sup>

The study limitations included absence of a control group and not considering the seasonal variation of the disease. Furthermore, this study was conducted at only one tertiary care center in Saudi Arabia with a small sample size that does not represent all Saudi population. Therefore, we recommend further studies that include dermatology centers from all the regions of Saudi Arabia.

## Conclusion

In conclusion, this study used IDQoL score to identify the negative impact of Atopic Dermatitis on the quality of life of children, and it showed that the disease severity was directly proportional to the impairment of patients' QoL.

Also, no significant difference was identified between gender, age group in comparison to the severity. Briefly, the study infers how the disease's span across the body correlated with deterioration in the patients' life quality. Therefore, prompt management and control of the condition is suggested especially in infancy and early childhood.

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## PEER REVIEW

Not commissioned. Externally peer reviewed.

## CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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## ETHICS COMMITTEE APPROVAL

King Abdullah International Medical Research Center, institutional review board. Study number: SP20/095/J Ref. No. JED-20-427780-59454

**Table 1: Demographics and medical history of the enrolled subjects with the corresponding overall Infant’s dermatitis quality of life (IDQoL) score**

Variables	n=80 (%)	Mean overall IDQoL (±SD)	p-value $\alpha$
<b>Gender (%)</b>			
Male	41 (51.2)	18.51 (±5.58)	0.495
Female	39 (48.8)	17.74 (±4.33)	
<b>Age group (%)</b>			
1 month-2 years	37 (46.3)	18.57 (±4.67)	0.774
2 years – 3 years	29 (36.3)	17.83 (±5.46)	
>3 years	14 (17.5)	17.64 (±4.08)	
<b>History of atopy<sup>⊠</sup></b>			
Atopic conjunctivitis (AC) (%)			0.179
Negative	73 (91.2)	17.90 (±5.14)	
Positive	7 (8.8)	20.57 (±1.81)	
<b>Allergic rhinitis (AR) (%)</b>			
Negative	77 (92.6)	17.99 (±4.99)	0.174
Positive	3 (3.8)	22.00 (±3.46)	
<b>Asthma (%)</b>			
Negative	63 (78.7)	17.44 (±4.97)	0.016
Positive	17 (21.3)	20.71 (±4.28)	
<b>Current treatment (%)</b>			
No treatment is used	16 (20)	15.25 (±4.58)	0.025
Moisturizers only	19 (23.8)	17.89 (±5.30)	
Moisturizers and topical steroids	39 (48.8)	19.49 (±4.53)	
Moisturizers, topical steroids, and calcineurin inhibitors*	1 (1.3)	-	
Unknown	5 (6.3)	16.40 (±4.98)	
<b>Percentage of body involved: (%)</b>			
Less than 5%	39 (48.8)	15.28 (±3.63)	<0.0001
5-30%	28 (35)	20.25 (±4.01)	
>30%	13 (16.3)	22.15 (±5.64)	

p-value was calculated at a confidence interval of 95%

**Table 2: Univariate analysis in correspondence to the percentage of the body involved of the enrolled subjects**

Variables	Percentage of body involved			p-value $\alpha$
	<5% n=39	5-30% n=28	>30% n=13	
<b>Gender (%)</b>				
Male	22 (56.4)	14 (50)	5 (38.5)	0.526
Female	17 (43.6)	14 (50)	8 (61.5)	
<b>Age group (%)</b>				
1 month-2 years	18 (46.2)	13 (46.4)	6 (46.2)	0.631
2 years – 3 years	15 (38.5)	8 (28.6)	6 (46.2)	
>3 years	6 (15.4)	7 (25)	1 (7.1)	
<b>Concurrent allergic conjunctivitis (%)</b>	2 (5.1)	5 (17.9)	0	0.091
<b>Concurrent allergic rhinitis (%)</b>	0	3 (10.70)	0	0.055
<b>Concurrent asthma (%)</b>	5 (12.8)	10 (35.7)	2 (15.4)	0.066

$\alpha$  p- value was calculated at a confidence interval of 95% using chi-square test

**Table 3: Mean and standard deviation (SD) of each item in Infant’s dermatitis quality of life (IDQoL) questionnaire in correspondence to the percentage of the body involved of the enrolled subjects**

IDQoL questionnaire items	Overall item mean (±SD)	Percentage of body involved			p-value <sup>ⓧ</sup>
		<5%	5-30%	>30%	
1. Itching and scratching	2.21 (0.92)	1.82 (±0.82)	2.54 (±0.84)	2.69 (±0.95)	0.001
2. Mood	1.85 (1.15)	1.49 (±0.91)	2.07 (±1.18)	2.46 (±1.39)	0.012
3. Time to get to sleep	1.58 (0.76)	1.33 (±0.53)	1.75 (±0.93)	1.92 (±0.76)	0.015
4. Sleep disturbance disturbed	1.48 (0.76)	1.18 (±0.45)	1.61 (±0.79)	2.08 (±1.04)	<0.0001
5. Interfering with playing time	1.48 (0.73)	1.23 (±0.49)	1.64 (±0.87)	1.85 (±0.80)	0.008
6. Interfering with family activity	1.23 (0.48)	1.10 (±0.31)	1.25 (±0.52)	1.54 (±0.66)	0.014
7. Interfering with mealtime	1.55 (0.63)	1.41 (±0.59)	1.79 (±0.69)	1.46 (±0.52)	0.048
8. Problems from treatment	1.11 (0.32)	1.13 (±0.34)	1.07 (±0.26)	1.15 (±0.38)	0.682
9. Discomfort while dressing	1.53 (0.68)	1.28 (±0.46)	1.82 (±0.72)	1.62 (±0.87)	0.004
10. Problems at bath time	1.50 (0.73)	1.31 (±0.52)	1.68 (±0.82)	1.69 (±0.95)	0.069

ⓧ p- value was calculated at a confidence interval of 95% using one-way ANOVA test