

## Quality of Life of Patients with Asthma in Saudi Arabia

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### ABSTRACT

**Introduction:** Asthma is a condition in which your airways narrow and swell and may produce extra mucus. This can make breathing difficult and trigger coughing, a whistling sound (wheezing) when you breathe out and shortness of breath.

**Objective:** To assess the quality of life for adult patients with asthma in Saudi Arabia.

**Method:** This was an online cross-sectional study that was conducted on adult patients with asthma. Data were collected for the period between November 2022 and April 2023. Asthma Quality of Life Questionnaire (AQLQ) was used to assess patients' quality of life. Binary logistic regression analysis was used to identify predictors of better quality of life.

**Results:** A total of 355 patients with asthma participated in this study. Patients with asthma showed moderate to high quality of life with a mean quality of life score of 121.8 (SD: 31.8) out of 196 (equal to 72.7%). Patients' quality of life score ranged between 19 and 196. Binary logistic regression analysis identified that patients aged 36-40 years, males, and married patients were more likely to have better quality of life compared to others ( $p < 0.05$ ).

**Conclusion:** Overall, the quality of life for adult patients with asthma was moderate to high, which reflects good control over their disease. Patients need further support to maintain and improve their quality of life, specifically, these efforts should be directed towards females and elderly patients.

**Keywords:** Asthma; Patients; Quality of Life; Saudi Arabia

### INTRODUCTION

Asthma is a chronic inflammatory respiratory condition that is characterized by a variety of symptoms, such as decreased expiratory airflow, shortness of breath, coughing, chest tightness, and wheezing, influencing a person's daily activities performance during the day and night<sup>1</sup>. Globally, asthma is a significant public health issue that affects all age groups; it impacted approximately 262 million individuals<sup>2</sup> and resulted in 455,000 mortality in 2019<sup>3</sup>.

The principal asthma therapy goal is to realize optimal lung function, ensure normal activity and sleep patterns, and reduce or eliminate symptoms, which can be attained through regular follow-up, individualized medication, environmental triggers avoidance, and patient education<sup>4</sup>. Poorly managed asthma affects the quality of life (QoL) significantly, including social, occupational, emotional, and physical domains of QoL. Still, manifestations vary across different people<sup>5</sup>.

Earlier studies have reported deterioration of QoL and psychological distress among patients with asthma<sup>6</sup>. Many previous studies have demonstrated decreased health-related QoL in asthmatic patients<sup>7-10</sup>. In addition, asthma can adversely affect patients' QoL by limiting overall physical activity and lowering the productivity of employees<sup>11</sup>. Numerous factors can affect health-related QoL in asthmatic patients, including access to healthcare insurance, adherence to treatment guidelines by healthcare providers, comorbidities, level of asthma control, and gender<sup>12-19</sup>.

In the Middle East, compared to controlled asthma, uncontrolled asthma sets a significant burden, leading to more daily life disruption,

decreased QoL, and raised health service use<sup>20</sup>. Asthma is increasingly common in Saudi Arabia, with prior investigations implying an upsurge in its prevalence as one of the most frequently occurring chronic diseases<sup>21-24</sup>. In Saudi Arabia, asthma prevalence is 17.6%, which is the third most elevated asthma prevalence rate in the Eastern Mediterranean Region (EMR), according to an earlier meta-analysis<sup>25</sup>.

Understanding factors that affect the QoL for asthmatic patients in Saudi Arabia will aid in informing tailored interventions to enhance asthma management approaches. Such research can highlight the broader impacts of asthma on physical, emotional, social, and occupational functioning and hence has significant implications for public health policies, patient-centered care, resource allocation, and, finally, the well-being of asthma patients in Saudi Arabia. Accordingly, this study aimed to assess the QoL for adult patients with asthma in Saudi Arabia.

### METHODS

#### Study design:

This was an online cross-sectional study that was conducted on adult patients with asthma. Data were collected for the period between November 2022 and April 2023.

#### Sampling procedure

Convenience sampling technique was employed to recruit the sample for this investigation. This method of sampling falls under the classification of non-probability sampling. This research comprised eligible patients who met our inclusion criteria and were willing to participate. On the first page of the questionnaire, patients were presented with an informed consent form and given the option to

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continue or discontinue. To ensure that the patients understood the significance of their involvement, the study's objectives were presented in detail. In the invitation letter for the study, the inclusion criteria were specified.

### Study population and recruitment

This study's population consisted of patients with asthma who were 18 years or older. There were no exclusion criteria based on gender, age, or disease duration. The survey link was shared on social media platforms to invite those with asthma to participate.

### Questionnaire tool:

Asthma Quality of Life Questionnaire (AQLQ) is a 32-item questionnaire used to assess the physical, occupational, emotional, and social qualities of adults aged 17 to 70 years with asthma<sup>26</sup>. The AQLQ has 4 domains: symptoms (12 items), activity limitation (6 generic and 5 patient-specific items), emotional function (5 items), and environmental stimuli (4 items). The AQLQ was developed for patients exhibiting mild to moderate asthma<sup>27</sup>. The AQLQ items are each scored on a 7-point Likert scale, with 1 representing maximal impairment and 7 representing no impairment. The maximum attainable score is 196, the higher the score the higher the QoL.

### Ethical approval

The study was approved by the Research Ethics Committee at King Faisal University, Saudi Arabia (KFU-REC-2022-NOV-ETHICS302). This study was performed in accordance with the principles stated in the Declaration of Helsinki. All participants gave their consent before being involved in this study.

### Statistical analysis

This study's data were analyzed using version 29 of the SPSS program. Normality measurements and a histogram indicated that the QoL score followed a normal distribution. Therefore, we presented it using the mean (standard deviation (sd)). The factors impacting patients' QoL were determined using binary logistic regression analysis, with the patients' mean QoL score (121.8) serving as the dummy variable. Statistical significance was determined as a two-sided p-value less than 0.05.

## RESULTS

### Patients' demographic characteristics

A total of 355 patients with asthma participated in this study. More than half of them were aged 18-25 years (64.5%) and were females (58.3%). Around 54.0% of the patients were unemployed and 25.4% of them reported that they work outside the healthcare sector. Around 67.0% of the patients were married. For further details on the demographic characteristics of the study patients refer to Table 1.

**Table 1.** Patients' demographic characteristics

Percentage	Frequency	Variable
<b>Age</b>		
64.5%	229	18-25 years
11.0%	39	26-35 years
12.4%	44	36-40 years
8.2%	29	41-50 years
3.4%	12	51-60 years

0.6%	2	60 years and above
<b>Gender</b>		
58.3%	207	Females
<b>Occupation</b>		
53.5%	190	Unemployed
25.4%	90	Work outside healthcare sector
6.2%	22	Retired
14.9%	53	Work in healthcare sector
<b>Marital status</b>		
67.0%	238	Single
29.6%	105	Married
2.0%	7	Divorced
1.4%	5	Widowed

### Patients' quality of life

Patients with asthma showed moderate to high QoL with a mean QoL score of 121.8 (SD: 31.8) out of 196 (equal to 72.7%). Patients QoL score ranged between 19 and 196. Binary logistic regression analysis identified that patients aged 36-40 years, males, and married patients were more likely to have better QoL compared to others ( $p < 0.05$ ), Table 2.

**Table 2:** Binary logistic regression analysis

P-value	Odds ratio of having better of quality of life	Variable
<b>Age</b>		
1.00		18-25 years (Reference group)
0.429	0.76 (0.39-1.49)	26-35 years
0.023*	2.16 (1.11-4.18)	36-40 years
0.809	1.10 (0.51-2.35)	41-50 years
0.976	1.02 (0.32-3.22)	51-60 years
0.990	1.02 (0.06-16.39)	60 years and above
<b>Gender</b>		
1.00		Females (Reference group)
0.039*	1.57 (1.02-2.39)	Males
<b>Occupation</b>		
1.00		Unemployed (Reference group)
0.410	1.22 (0.76-1.98)	Work outside healthcare sector
0.078	2.29 (0.91-5.76)	Retired
0.829	1.07 (0.60-1.91)	Work in healthcare sector
<b>Marital status</b>		
1.00		Single (Reference group)
0.038*	1.63 (1.03-2.58)	Married
0.277	0.40 (0.08-2.09)	Divorced
0.206	4.14 (0.46-37.41)	Widowed

## DISCUSSION

Comprehending quality of life is vital to enhancing rehabilitation, care, and relief of symptoms among patients<sup>28</sup>. Therefore, quality-of-life assessment among asthmatic patients is fundamental. In our study, we declared that patients with asthma demonstrated a moderate to high QoL, based on the mean QoL score of 121.8 (SD: 31.8) out of 196, equal to 72.7% among patients, whose scores ranged between 19 and 196. These findings underline a generally favorable QoL among the Saudi population. However, the variability between individuals indicates the complex interplay between asthma symptoms, treatment management, and psychosocial factors that affect the QoL for the patients.

Our results contrast with results from Europe, in which 56.5% of the patients had suboptimal control and insufficient QoL<sup>29</sup>, and with results from Pakistan, in which 71.4% of the bronchial asthma patients reported poor QoL<sup>8</sup>. In Indonesia, the mean QoL was fair, with scores of  $3.82 \pm 1.18$  out of 7<sup>30</sup>; that is, it was lower than the QoL we have found. In the same way, patients in Semnan had a lower score in all domains compared to the reference population<sup>31</sup>; in Tehran, 48.3% of patients scored below the mean QoL and 51.7% scored above it<sup>32</sup>. These suggested that asthma patients in Saudi Arabia may have more effective management and healthcare resources, resulting in a better QoL. Healthcare framework, economic status, and cultural attitudes toward health factors may result in these regional disparities. Other factors brought out by prior studies are that QoL scores are affected by aspects such as the overall QoL, public health perception, functional situation, disorder symptoms, and physiological aspects<sup>33,34</sup>; all this underlines the importance of having a person-centered approach in healthcare strategies for better asthma-related QoL.

In our study, binary logistic regression analysis identified that patients aged 36-40 years, males, and married patients were more likely to have a better QoL compared to others ( $p < 0.05$ ). These findings underline the enormous influence of demographic factors on asthma-related QoL and agree with multiple findings from the existing literature in this consideration. Prior studies' results underline factors such as gender (females), body mass index (BMI) (obese), and age (middle-aged), which contribute to the effect on asthma patients' QoL<sup>35</sup>. Asthma control has appeared as the most significant factor related to QoL, disease management<sup>36</sup>, place of residence<sup>36</sup>, occupation<sup>37,38</sup>, education level<sup>36,37,39</sup>, BMI<sup>40,41</sup>, age<sup>36,42,43</sup>, gender<sup>36,44,45</sup>, marital status<sup>36</sup>, and employment status<sup>36</sup> also influence health-related QoL. Other significant factors, including exposure to environmental triggers, emotional well-being, symptoms presence, and physical inactivity are diminished asthmatic patient health-related QoL<sup>36</sup>. Such findings offer influential evidence of the complex nature of asthma and its management, hence the need to understand how these factors interact to generate comprehensive management strategies that adopt medical and socioeconomic aspects of asthma care.

Regarding our finding that middle-aged patients (36-40 years) reported better QoL, it contrasts with several prior studies. A previous investigation in Taiwan has shown that patients in the younger and older age group often have a better QoL compared with their middle-aged counterparts due to the lower level of physical impairments associated with emotional stress and family responsibilities<sup>46</sup>. Another study indicated that family responsibilities and financial problems negatively affected the health-related QoL in middle-aged patients in India; hence, they have lesser scores for asthma-specific QoL than other age counterparts<sup>35</sup>. Such differences might be due to differences in socio-economic conditions and healthcare support systems in different regions.

Our finding that males have a better QoL was consistent with many previous studies in which males generally reported better asthma-related QoL<sup>8,43,47-51</sup>. Previous studies have demonstrated that females usually have a more significant impairment of QoL, with an increased depression rate, elevated healthcare utilization, more symptoms, and inadequate asthma control than males<sup>29,47,52</sup>. Studies conducted in the Riyadh emergency rooms found that the preponderance of the asthma asthmatics admitted to hospitals were female<sup>53</sup>. Most of the asthmatic patients in Saudi Arabia had uncontrolled asthma, primarily female<sup>54</sup>. Besides, being a male was identified as a protective factor against the poor QoL<sup>55</sup>. On the other hand, females had heightened exposure to triggers of asthma related to hormonal changes, including raised exacerbations during menstruation, which influenced their health-

related QoL negatively<sup>56</sup>.

Several studies support the finding that the QoL was better in married patients; this could be due to marriage bringing substantial financial, emotional, and social support, which may ease the stresses associated with chronic illnesses<sup>57-59</sup>. Married people tend to report higher QoL levels, greater psychological well-being, and lower psychological distress compared with their unmarried counterparts<sup>60-62</sup>. Nevertheless, other investigations have demonstrated that unmarried patients reported better health-related QoL<sup>63,64</sup>, which may be due to fewer familial responsibilities and stressors. These underline the dual nature of marriage, which provides support and, at the same time, imposes other responsibilities that adversely affect the QoL under certain circumstances.

Based on our findings in the present study, to improve the QoL of asthma patients in Saudi Arabia, we recommend the development of health interventions that are individualistic to the needs of the patients, education about asthma, psychosocial support, health care policy change, and further research on the underlying factors associated with differences in QoL among asthma patients in the country.

## CONCLUSION

**Overall, the QoL for adult patients with asthma was moderate to high, which reflects good control over their disease. Patients need further support to maintain and improve their QoL, specifically, these efforts should be directed towards females and elderly patients.**

## Author Contributions

A.K.A supervised this study in term of methodology, statistical analysis and rafting. All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

## Ethics Approval and Informed Consent:

The study was approved by the Research Ethics Committee at King Faisal University, Saudi Arabia (KFU-REC-2022-NOV-ETHICS302). This study was performed in accordance with the principles stated in the Declaration of Helsinki. All participants gave their consent before being involved in this study.

**Potential Conflicts of Interest:** None

**Competing Interest:** None

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