

## Quality of Life among Asthmatic Children in Zagazig University Hospitals

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### ABSTRACT

**Background:** Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation. The Pediatric Asthma Quality of Life Questionnaire (PAQLQ) is one of the most widely used instruments for measuring health-related QOL in children with asthma.

**Objective:** to evaluate health-related quality of life (HRQOL) in children with bronchial asthma to identify the most important determinants adversely affecting their QOL.

**Patients and methods:** This study was conducted on 72 asthmatic children over six months period. They were recruited from The Outpatient Clinic of Pediatrics Pulmonology Unit, Zagazig University Hospitals. All study patients were subjected to complete history taking, clinical examination, determination of level of asthma symptom control and filling PAQLQ.

**Results:** About 58% of patients had partially controlled asthma and one quarter of them had well controlled asthma (Symptoms domain was the most affected domain ranged from 3 to 5.2 with mean 4.056). There was statistically significant relation between sex and physical, emotional and overall score of PQLQ. There was statistically significant relation between residence & social class and QOL scores. There was statistically significant relation between BMI and QOL scores

**Conclusion:** Asthma significantly adversely affects the QOL of the affected children. Control of the main determinants of QOL scores might improve the QOL of these patients.

**Keywords:** Asthma, Quality of life, Children.

### INTRODUCTION

Bronchial asthma is a heterogeneous chronic inflammatory airway disease characterized by recurrent respiratory symptoms such as cough, dyspnea and wheeze with variable expiratory airflow limitation<sup>(1)</sup>. Asthma is a major public health problem in all countries. Asthma affects around three hundred million people worldwide according to the Global Burden of asthma report in 2016. the prevalence of asthma is increasing among children<sup>(2)</sup>. Asthma puts a serious burden on the child's health-related quality of life (HRQOL), despite the availability of effective and safe treatment<sup>(3)</sup>. The overall goal of asthma management is to achieve optimal disease control and HRQOL improvements<sup>(4)</sup>.

The use of HRQOL as an essential outcome measure of childhood asthma treatment and management has increased. Poorly controlled asthma symptoms impair the HRQOL of children<sup>(5)</sup>. The Pediatric Asthma Quality of Life Questionnaire (PAQLQ) was developed to measure the functional problems (physical, emotional, and social) that have the most impact on children (7–17 years) with asthma<sup>(6)</sup>.

PAQLQ has 23 questions in three domains (symptoms, activity limitation and emotional function). The PAQLQ has a time specification of one week so children were asked to recall their experiences during the previous week, there is evidence that this is the maximum length of time over which younger children can recall their experiences with any degree of accuracy<sup>(7)</sup> and to respond to each question on a 7-point scale (7

= no impairment, 1 = severe impairment). Three of the activity questions were "patient-specific" which means that each child identified and scored three activities, which were limited by his asthma<sup>(8)</sup>.

Therefore, this study aimed to evaluate health-related quality of life (HRQOL) in children with bronchial asthma to identify the most important determinants adversely affecting their QOL.

### PATIENTS AND METHODS

This study was conducted on 72 asthmatic children over six months period. They were recruited from the Outpatient clinic of pediatrics pulmonology unit at Zagazig university hospitals.

**Inclusion criteria:** Patients with bronchial asthma, aged between 7 and 14 years whose parents agreed to participate on the study. Both sexes were involved.

### Exclusion criteria:

Patients with bronchial asthma younger than 7 years of age or older than 14 years. Patients whose parents refused to participate in the study. Patients diagnosed with other chronic pulmonary disorder.

### Operative Assessment:

Full history in the form of personal history (name, age, sex, residence, parental education and occupation and parental smoking), history of present illness, history of other diseases or associated co-morbidities and past



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history of daily activities, frequency of daytime symptoms and nocturnal awakening number and forms of medication used.

Clinical examination included measuring both weight and height from which the body mass index (BMI) have been calculated as  $BMI = \text{weight (kg)} / \text{height (m)}^2$ . For children and teens, BMI is age and sex specific and is often referred to as BMI for age. A child's weight status is determined using an age and sex specific percentile for BMI rather than the BMI categories used for adults <sup>(9)</sup>.

Assessment of socioeconomic status by **El-Gilany et al.** <sup>(10)</sup> included seven domains: educational and cultural domain, occupation domain, family domain, family possessions domain, home sanitation domain, economic domain and health care domain.

Determining level of asthma symptoms control by GINA guidelines for the level of asthma symptoms control: To assess symptoms control, the following was asked about over the past four weeks: frequency of daytime and nighttime asthma symptoms, reliever use for relief of symptoms and activity limitation. Levels of asthma-related symptoms were classified as well controlled if none of these are present, partly controlled if 1 or 2 of these are present and uncontrolled if 3 or 4 of these are present <sup>(1)</sup>.

Filling PAQLQ for each asthmatic child: Pediatric asthma quality of life questionnaire (PAQLQ) <sup>(6)</sup>. PAQLQ has 23 questions in three domains (symptoms, activity limitation and emotional function). The number of questions in each domain is as follow: symptoms: 10, activity limitation: 5 (2 general, 3 patient specific), and emotional function: 8.

#### **Ethical consideration:**

**The study was approved by the Ethical Committee of Zagazig Faculty of Medicine. An informed consent was obtained from every patient in this research. Every patient received an explanation for the purpose of the study. All given data were used for the current medical research only. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.**

#### **Statistical analysis:**

Data were computed using a data base software program (Statistical Package for Social Science, SPSS) version 20. Quantitative variables were expressed as the mean  $\pm$  standard deviation (SD) and range, and the categorical variables were expressed as a number and percentage. For quantitative variables, independent samples t-test (t) was used to compare means of two groups and to compare means of more than two groups over time, one-way ANOVA test was used. For categorical variables, Chi square ( $X^2$ ) and Fisher's exact tests were used to compare the two studied groups. The level of statistical significance: P value  $\leq$  0.05 was considered statistically significant and P value  $<$  0.001 indicated highly significant results.

#### **RESULTS**

The present study showed age of the studied patients ranged from 7 to 14 years with mean 8.64 years. About 55.6% were females, 61.1% living in rural areas. About 50% and 37.5% of patients' mothers and fathers had secondary and high education respectively. About 71% of mothers of patients were housewives. About 72% of families had middle social class and 72% of patients denied that their parents smoke. Positive family history was present in 51.4%. About 73.6% of patients had average body built (**Table 1**). About 58% of patients had partially controlled asthma and one quarter of them had well controlled asthma (**Table 2**). Symptoms domain was the most affected domain ranged from 3 to 5.2 with mean 4.056 (**Table 3**).

There was statistically significant relation between sex and physical, emotional and overall score of PQLQ (**Figure 1**). There was statistically significant relation between residence & social class and QOL scores (urban residence & high social class had significantly higher scores) (**Table 4**).

There was statistically non-significant relation between family history & exposure to smoking and QOL scores (patients with negative family history & with no exposure to smoking had non-significantly higher scores) except emotional score (There was statistically significant relation) (**Table 5**). There was statistically significant relation between BMI and QOL scores (patients with average weight had significantly higher scores) (**Figure 2**).

**Table (1):** Socio-demographic and personal characteristics of the studied patients

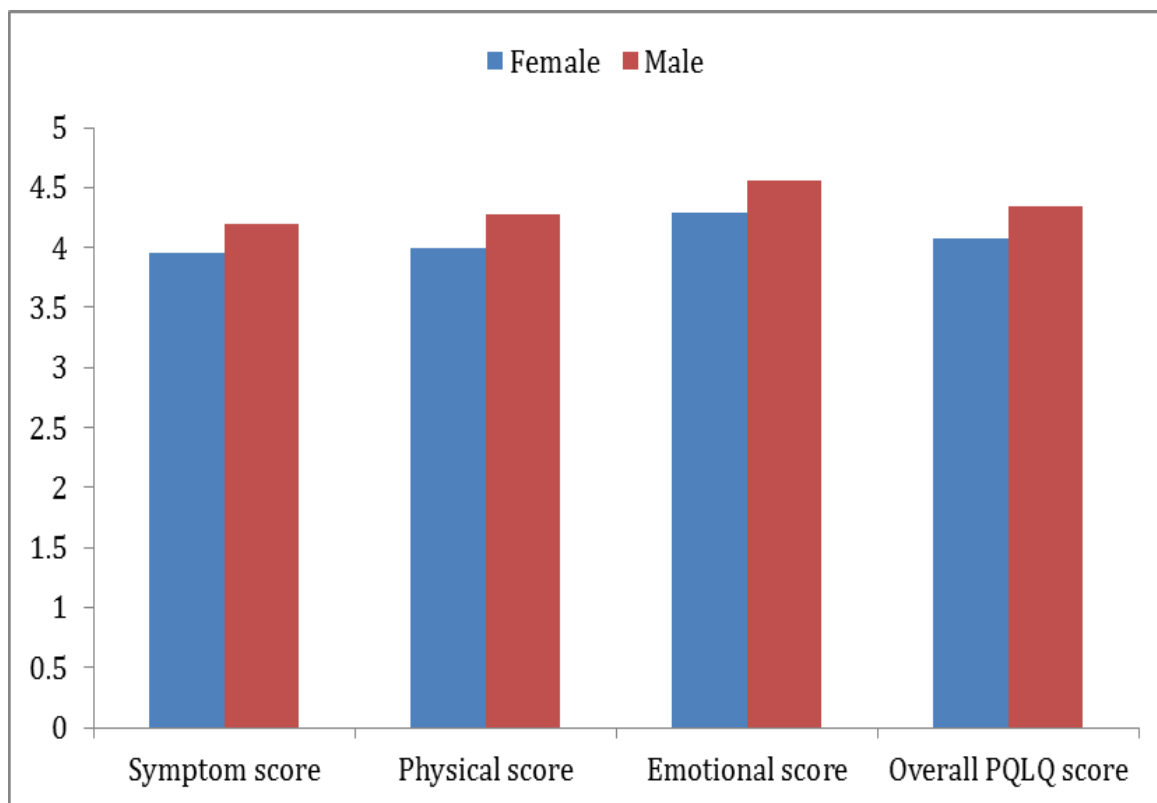
	N=72	%
Age (years): Mean ± SD Range	8.64 ± 2.002 7 – 14	
Gender: Female Male	40 32	55.6 44.4
Residence: Rural Urban	44 28	61.1 38.9
Mother education: Illiterate Basic Secondary High	6 6 36 24	8.3 8.3 50 33.3
Father education: Illiterate Basic Secondary High	17 3 25 27	23.6 4.2 34.7 37.5
Mother occupation: Housewife Employee	51 21	70.8 28.2
Social class: Very low Low Middle High	2 6 52 12	2.8 8.3 72.2 16.7
Family history of asthma: Negative Positive	35 37	48.6 51.4
Exposure to smoking: No Yes	52 20	72.2 27.8
BMI: Underweight Average Overweight Obese	6 53 9 4	8.3 73.6 12.5 5.6

**Table (2):** Level of asthma control of the studied patients

Level of asthma control	N=72	%
Well controlled	18	25
Partially controlled	42	58.3
Uncontrolled	12	16.7

**Table (3):** Pediatric asthma quality of life questionnaire (PAQLQ) scores among the studied patients

PQLQ domains	Mean ± SD	Median	Range
Symptoms domain	4.056 ± 0.559	4	3 – 5.2
Physical domain	4.124 ± 0.555	4.05	3.1 – 5.3
Emotional domain	4.406 ± 0.566	4.2	3.5 – 5.7
Total score	4.198 ± 0.554	4.1	3.2 – 5.4



**Figure (1):** Multiple bar chart showing relation between sex and PAQLQ domains and overall score

**Table (4):** Effect of residence and social class on QOL scores among the studied patients

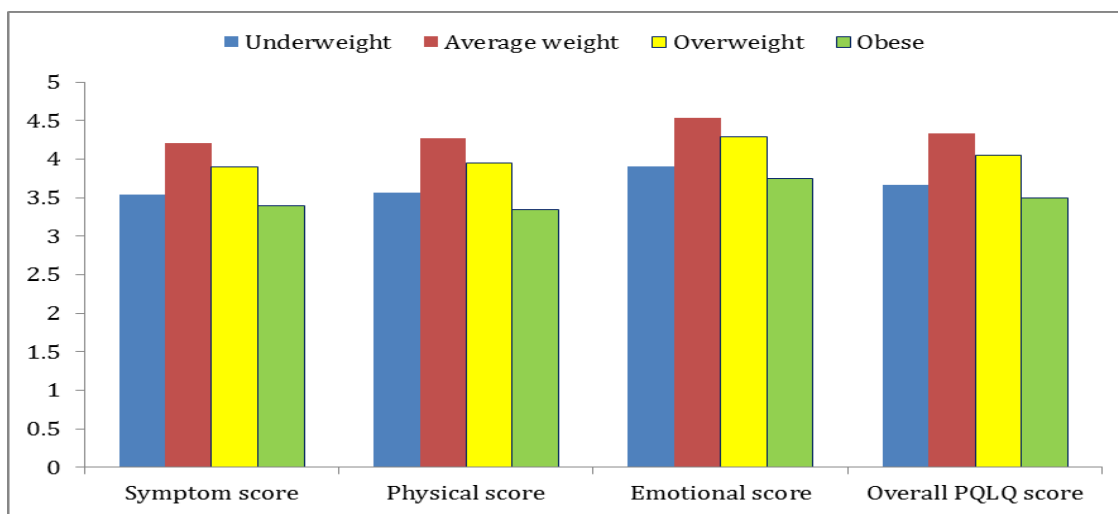
	Symptom score		Activity score		Emotional score		Total score	
	Mean ± SD	Range	Mean ± SD	Range	Mean ± SD	Range	Mean ± SD	Range
Residence:								
Rural	3.963±0.523	3-5.2	3.991±0.517	3.1-5.3	4.264±0.511	3.5-5.7	4.064±0.509	3.2-5.4
Urban	4.268±0.562	3.2-5.1	4.332±0.558	3.3-5.1	4.63±0.584	3.7-5.4	4.409±0.564	3.4-5.2
P (t)	0.013*		0.01*		0.009*		0.009*	
Social class:								
Very low <sup>a</sup>	3.95 ±0.707 <sup>a,d</sup>	3.9-4	4.15±0.707	4.1-4.2	4.325±0.11 <sup>a,d</sup>	4.25 - 4.4	4.125±0.106 <sup>a,d</sup>	4.05-4.2
Low <sup>b</sup>	3.4 ± 0.358 <sup>b,c,d</sup>	3-3.8	3.467±0.314 <sup>b,c,d</sup>	4.2	3.833±0.274 <sup>b,c,d</sup>	4.4	3.567±0.314 <sup>b,c,d</sup>	4.2
Middle <sup>c</sup>	3.985±0.436 <sup>c,b,d</sup>	3.2-5	4.062±0.454 <sup>b,c,d</sup>	3.1-3.8	4.319±0.462 <sup>b,c,d</sup>	3.5-4.1	4.127±0.45 <sup>b,c,d</sup>	3.2-3.9
High <sup>d</sup>	4.7 ± 0.519 <sup>a,b,c,d</sup>	3.8-5.2	4.717±0.592 <sup>b,c,d</sup>	3.3-5.1	5.083±0.57 <sup>a,b,c,d</sup>	3.7-5.5	4.833±0.558 <sup>a,b,c,d</sup>	3.4-5.2
P (F)	<0.001**		<0.001**		<0.001**		<0.001**	

t Independent sample t test F One way ANOVA \*p<0.05 is statistically significant \*\*p≤0.001 is statistically highly significant

**Table (5):** Effect of family history of asthma and exposure to smoking on QOL scores among the studied patients

	Symptom score		Activity score		Emotional score		Total score	
	Mean ± SD	Range	Mean ± SD	Range	Mean ± SD	Range	Mean ± SD	Range
Family history								
Negative	4.127±0.652	3.3-5.2	4.203±0.641	3.1-5.3	4.507±0.658	3.5 – 5.7	4.278±0.647	3.2-5.4
Positive	4.011±0.463	3.2-4.9	4.053±0.463	3.3-5	4.316±0.458	3.7-5.4	4.126±0.452	3.4 – 5.1
P (t)	0.393		0.263		0.162		0.259	
Exposure to smoking:								
No	4.123±0.587	3.2-5.2	4.185±0.583	3.3-5.3	4.489±0.592	3.7-5.7	4.265±0.583	3.4-5.4
Yes	3.915±0.456	3 – 4.6	3.965±0.45	3.1-4.7	4.19±0.433	3.5-5.1	4.023±0.434	3.2 – 4.8
P (t)	0.159		0.134		0.024*		0.096	

t Independent sample t test F One way ANOVA \*p<0.05 is statistically significant \*\*p≤0.001 is statistically highly significant



**Figure (2):** Multiple bar chart showing relation between BMI classes and PAQLQ scores

**DISCUSSION**

Asthma is a heterogeneous, multifactorial disease with variable and mostly reversible bronchospasm based on a chronic bronchial inflammatory reaction. The clinical picture (cough, wheezing, or shortness of breath) are changeable and correlated with expiratory flow restriction (11). The overall goal of asthma management is to achieve optimal disease control and HRQOL improvements (12). The use of HRQOL as an essential outcome measure of childhood asthma treatment and management has increased (13). The Pediatric Asthma Quality of Life Questionnaire (PAQLQ) is one of the most widely used instruments for measuring health related quality of life in asthmatic children (14).

The aim of this study was to detect the impact of bronchial asthma on quality of life of asthmatic children and to identify the most important factors affecting their QOL. Our study was a cross sectional study, which included 72 asthmatic children aged 7-14 years attending the Outpatient Clinic of Pediatrics Pulmonology Unit, Zagazig University Hospital over a six months period. all study patients were subjected to complete history taking clinical examination, determination of level of asthma symptom control and filling PAQLQ. The study included 72 patients with bronchial asthma with mean age 8.64 years. About

55.6% were females. Our data showed that there was no statistically significant difference between patient’ age and QOL, which is in agreement with **Al-Gewely et al.** (15). Studied patients showed impaired QOL, with mean score 4.19 (3.2-5.4), which is far away from the ideal score of seven for the total and each of the three domains. Similarly **Al-Gewely et al.** (15) reported that participants showed impaired QOL (4.1). However, this is slightly higher than the corresponding mean score reported by previous studies in other regions of Egypt like that of **El-Gendi et al.** (16) and **Abdel-Hai et al.** (17). In our study, the patients’ QOL scores were lower in females than in males. It has been reported that females are more anxious about their health and therefore are more likely to over-report their symptoms and to show their deficiencies than males. This agrees with **El-Gendi et al.** (16) and with the results of previous studies measuring QOL in asthmatic adolescents using PAQLQ in Sweden **Rydstrom et al.** (18), in Jordan **Al-Akour and Khader** (19), and in Germany **Warschburger et al.** (20). QOL scores in asthmatic patients in our study were lower in rural inhabitants than urban ones, because of the difficulties to reach medical health care services, while urban children can probably attend medical facilities more easily and thus receive better care of their asthma (21). This is demonstrated in previous studies in

Egypt by **El-Gendi et al.** <sup>(16)</sup> and in Jordan by **Al-Akour and Khader** <sup>(19)</sup>.

In our study children from low social class had lower scores of QOL compared to high class. This reflects the lack of awareness of affordability of health care. This finding agrees with previous studies in Egypt **El-Gendi et al.** <sup>(16)</sup> and **Elshazly et al.** <sup>(22)</sup>.

In this study, there was no significant relation between parental smoking and QOL scores. This agrees with **Al-Gewely et al.** <sup>(15)</sup>. However, previous studies did not find a direct relationship between parental smoking and QOL of asthmatic children in United States <sup>(23,24)</sup>.

The present study showed a significant relation between BMI and all of symptom, physical, emotional and overall (total) score of PQLQ. QOL scores were lower in overweight/obese asthmatic children than those with average BMI. Similar results were reported in previous studies <sup>(25,26)</sup>.

## CONCLUSION

Asthma significantly adversely affects the QOL of the affected children. Control of the main determinants of QOL scores might improve the QOL of these patients.

**Financial support and sponsorship:** Nil.

**Conflict of interest:** Nil.

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