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Effect of Asthma on Quality of Life in Pediatrics

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ABSTRACT

Background: Asthma puts a serious burden on the child's health-related quality of life (HRQoL). The Pediatric Asthma Quality of Life Questionnaire (PAQLQ) was developed to measure the functional problems. The aim of the current study to assess HRQOL in children with bronchial asthma to recognize the most important determinants adversely affecting the QoL of them.

Patients and methods: A cross sectional study was conducted on asthmatic children aged 7-14 years attending the Outpatient Clinic of pediatrics pulmonology unit of Zagazig university hospital over a six months period. For all study patients, complete history taking and clinical examination for patients. Assessment of socioeconomic status, determining level of asthma symptom control and filling PAQLQ were done.

Results: The overall mean scores of the PAQLQ and its symptom, activity and emotional domains were 4.1, 4, 4.1 and 4.4; respectively. The score of symptoms was the most affected domain. There was statistically significant relation between residence, social class, BMI, mother education and occupation, father education, level of asthma control and the QoL of the affected children. There was statistically non-significant relation with age, sex, family history and exposure to smoking.

Conclusion: PAQLQ in asthmatic children improve the quality of routine care and quality of life which is the principle goal of management.

Keywords: Quality of Life, Asthma; PAQLQ; BMI; Family History

INTRODUCTION

Asthma is a major public health problem and implies a significant economic burden on societies through its effects on the child and his family and the health care cost **(1).**

Asthma impacts on the quality of life of both children and their caregivers. Studies have shown that asthmatic children have lower quality of life as regards their physical performance, their emotional performance, and their performance at school **(2)**.

The basic patho-physiologic features of asthma include airway hyper responsiveness (which manifest as reversible airway obstruction), inflammation, and structural changes in the airway wall, collectively termed airway remodeling. The development of allergic sensitization is the key to the immuno-pathology of pediatric disease. The combined clinical effects of these abnormalities result in the clinical manifestations of asthma including wheezing, dyspnea and cough **(3)**.

Asthma puts a serious burden on the child's health-related quality of life (HRQOL), despite the availability of effective and safe treatment **(4)**. Asthmatic children, especially those suffering from less disease control, show lower activity than normal children **(5)**.

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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 **(6)**.

This study was carried out aiming to assess health-related quality of life (HRQOL) in children with bronchial asthma to recognize the most important determinants adversely affecting the QoL of them.

PATIENTS AND METHODS

This cross sectional study was conducted on asthmatic children aged 7-14 years attending the Outpatient Clinic of pediatrics pulmonology unit of Zagazig university hospital over a six months period. Approval was taken from the ethical committee and also ethical consent was taken from parents of the patients included in the study. 72 patients diagnosed as bronchial asthma have been included in our study.

Inclusion and exclusion criteria:

Patients with bronchial asthma, aged between 7 and 14 years of both gender whose parents agreed to participate on the study. While, 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.

Operational design:

For all study patients, complete history taking and clinical examination for patients. Determining level of asthma symptoms control by GINA guidelines for the level of asthma symptoms control **(7)**.

Pediatric asthma quality of life questionnaire (PAQLQ):

Three of the activity questions were "patient-specific" which means that each child identified and scored three activities which were limited by his asthma. 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 and to respond to each question on a 7-point scale (7 = no impairment, 1 = severe impairment). Arabic version provided by the author was used.

Scoring of social class:

Social class was classified according to (El-Gilany et al., 2012) into very low (0-21), low (22-42), middle (43-63)and High (>63).

Scoring of PAQLQ

The questionnaire used seven points likert scale with maximum possible score for each item is seven (Not bothered /none of the time =Good) and the minimum score is one (Extremely bothered/All of the time =Bad). The overall PAQLQ score was the mean of the responses to each of the 23 questions. The resultant overall score would be between one and seven. Domain scores were also the mean values for the items in each domain so that the score of each domain would be also between one and seven (Eissa et al. ,2017).

Statistical analysis:

The analyzed by computer using a data base software program, Statistical Package for Social Science (SPSS) version 20. Quantitative variables were expressed as the mean ± 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

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variables, Chi square (X2) and Fisher's exact tests were used to compare the two studied groups. Pearson correlation coefficient and binary logistic regression were used. The level of statistical significance: P value <0.05 was considered statistically significant and P value < 0.001 indicated highly significant results.

RESULTS

The current study revealed about 58% of patients had partially controlled asthma and one quarter of them had well controlled asthma **(Figure 1)**. Symptoms domain was the most affected domain ranged from 3 to 5.2 with mean 4.056 **(Figure 2)**. There is statistically significant relation between sex and physical, emotional and overall score of PQLQ (Male patients had significantly higher scores) **(Table 1)**. High social class had significantly higher scores **(Figure 3)**.

Patients with negative family history had non-significantly higher scores **(Figure 4)**. There is statistically non-significant relation between exposure to smoking and QOL scores **(Figure 5)**. Regarding BMI, patients with average weight had significantly higher scores **(Table 2)**.

There is statistically significant relation between mother occupation and QoL scores (patients whose mothers are employee had significantly higher scores) **(Table 3)**. There is statistically significant relation between level of asthma control and QOL scores (well controlled patients had significantly higher scores) **(Figure 6)**.

On multivariate analysis of factors associated with lower symptoms domain PQLQ scores, partially and well controlled asthma non-significantly protected against low scores (AOR=0, p>0.05). Rural residence increased risk of poorer symptom domain increased risk by 1.225 (AOR=1.225, p>0.05). On multivariate analysis of factors associated with lower physical domain PQLQ scores, rural residence significantly increased risk of poorer physical domain by 4.375 (AOR=4.375, p<0.05). On multivariate analysis of factors associated with lower emotional domain PQLQ scores, partially and well controlled asthma non-significantly protected against low scores (AOR=0, p>0.05). Rural residence increased risk of poorer emotional domain increased risk by 1.143 (AOR=1.143, p>0.05) **(Table 4)**.

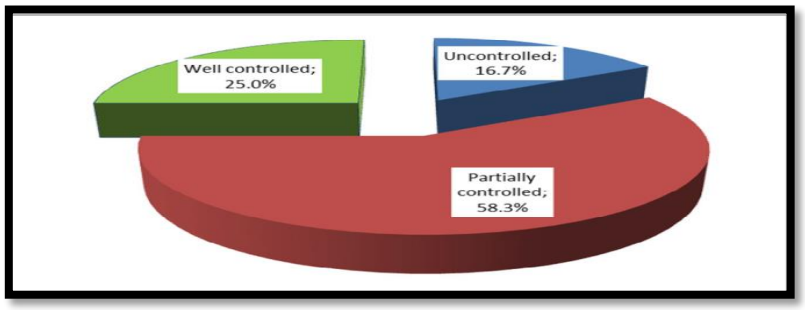

Figure (1) Pie chart showing distribution of the studied patients according to level of asthma control

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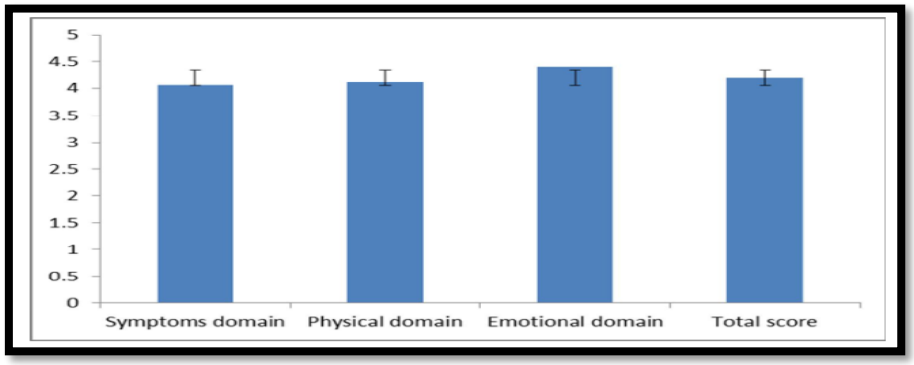

Figure (2) Pediatric asthma quality of life questionnaire (PAQLQ) scores among the studied patients.

Table (1) Correlation between sex and PAQLQ 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***
Sex:								
Female	3.96±0.592	3 – 5.1	3.995±0.566	3.1-5.1	4.285±0.57	3.5-5.5	4.08±0.57	3.2-5.2
Male	4.197±0.493	3.4-5.2	4.284±0.505	3.5-5.3	4.558±0.53	3.9-5.7	4.345±0.504	3.6-5.4
P (t)	0.074		0.027*		0.041*		0.043*	

t Independent sample t test F One way ANOVA *p<0.05 is statistically significant

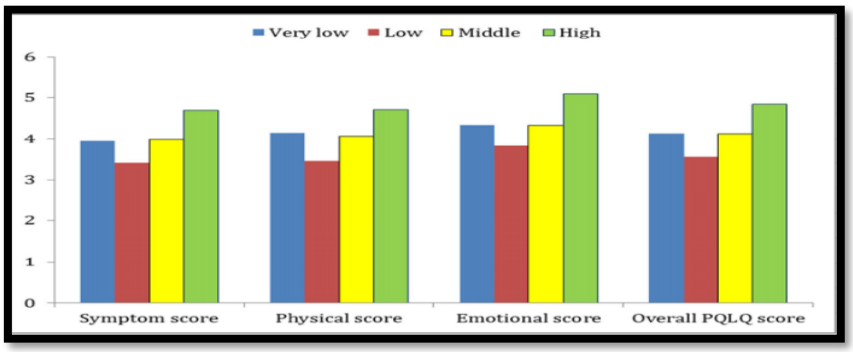

Figure (3) Multiple bar chart showing relation between social class and PAQLQ scores.

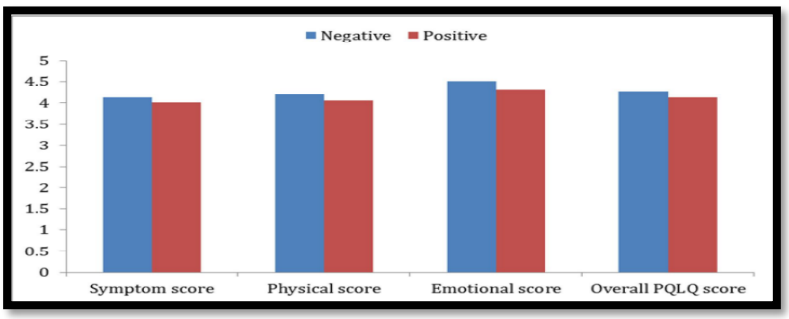

Figure (4) Multiple bar chart showing relation between family history and PAQLQ scores.

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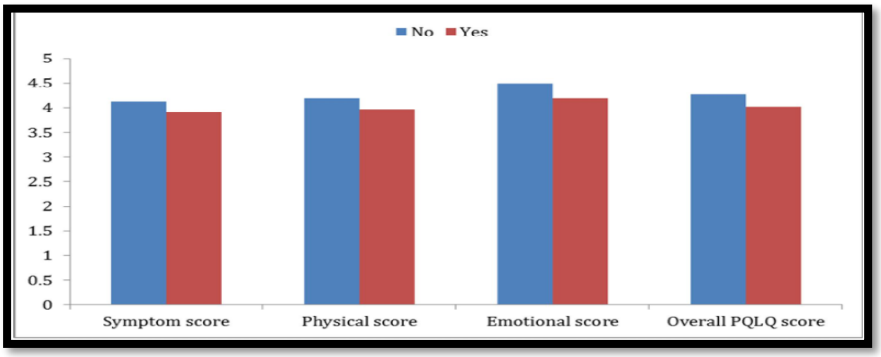

Figure (5) Multiple bar chart showing relation between exposure to smoking and PAQLQ scores.

Table (2) Effect of BMI 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*
BMI:								
Underweight [a]	3.533±0.273[a,b]	3.2-3.8	3.567±0.225[a,b]	3.3-3.8	3.9±0.155 [a,b]	3.7-4	3.667±0.207[a,b]	3.4-3.8
Average [b]	4.204±0.509[b,a,d]	3.3-5.2	4.276±0.501[b,a,d]	3.4-5.3	4.533±0.522[b,a,d]	3.8-5.7	4.337±0.514 [b,a,d]	3.5-5.4
Overweight [c]	3.9±0.608	3.4-5.1	3.944±0.568[c,d]	3.5-5.1	4.289±0.53	3.9-5.4	4.044±0.568	3.6-5.2
Obese [d]	3.4±0.462[b,d]	3-3.8	3.35±0.289[b,c,d]	3.1–3.6	3.75±0.289[b,d]	3.5-5.7	3.5±0.346[b,d]	3.2-3.8
P (F)	0.001**		<0.001**		0.003*		0.001**	

Table (3) Effect of mother occupation on QoL scores:

	Symptom score		*Activity score*		*Emotional score*		*Total score*	
	Mean±SD	*Range*	*Mean±SD*	*Range*	*Mean±SD*	*Range*	*Mean±SD*	*Range*
Occupation:								
Housewives	**3.973±0.532**	**3-5.2**	**4.031±0.524**	**3.1-5.3**	**4.307±0.511**	**3.5-5.7**	**4.103±0.517**	**3.2-5.4**
Employee	**4.291±0.57**	**3.4 -5.1**	**4.348±0.578**	**3.5-5.1**	**4.648±0.584**	**3.8-5.4**	**4.429±0.585**	**3.6-5.2**
P (t)	0.027*		0.027*		0.034*		0.022*	

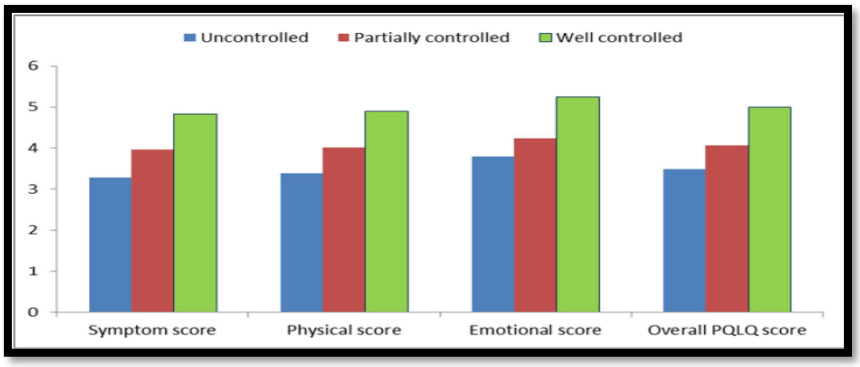

Figure (6) Multiple bar chart showing relation between level of asthma control and PAQLQ scores.

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Table (4) Binary logistic regression of variables associated with poorer PQLQ score (less than median)

	symptoms domain		physical PQLQ		Emotional domain		Total QOL domain	
	AOR	p	AOR	p	AOR	p	AOR	p
Residence (rural)	1.225	0.769	4.375	0.005*	1.143	.845		
Uncontrolled		1.000				1.000		1.000
Partially controlled	0.000	0.999			0.000	0.999	0.000	0.998
Control (well)	0.000	0.998			0.000	0.998	0.000	0.998
High father education								0.822
Illiterate fathers							0.400	0.347
Fathers with basic education							1292379891.7	0.999
Fathers with secondary							0.727	0.691

DISCUSSION

Asthma is a serious worldwide health problem affecting all age groups. Its prevalence is increasing in many countries. Although some countries have seen a reduction in hospitalizations and deaths from asthma, asthma still imposes a burden on health care systems, and on society **(7)**.

Asthma is a major problem for the child, the family and the community. Asthma attacks are responsible for disruption of life and reduced physical ability. There is an emotional, as well as economic impact of the disease. The social burden of asthma is considerable, affect all family members not only on the sick child **(8)**.

Validity and reliability of the adapted Arabic translation of PAQLQ-A was assessed among Egyptians **(9).**

This study showed that Asthma significantly adversely affects the QoL of the asthmatic children. The most affected QoL domain for asthmatic children was the symptoms domain. There is statistically significant relation between the QoL of the affected children and residence, social class, BMI, mother education and occupation, father education and level of asthma control. But there is statistically non-significant relation with age, sex, family history of asthma and parental smoking.

This study was lower than Jordanian asthmatic children, **Al-Akour and Khader, (10)**,also in Sweden **Nordlund et al. (11)** and in Brazil **Sarria et al.(12).** This might be related to the difference in the level of medical service and ethnic differences between our study and other studied populations.

This study demonstrated that the score of symptoms was the most affected domain, suggesting limitations in the medical service or non-compliance of the patients which is reflected on the level of control of their asthma and hence their symptoms. Similarly, previous studies reported that score of symptoms was the most affected **(9,13)**.

On the other hand, activity limitation domain was the most affected domain in previous studies measuring QoL among asthmatic children in Jordan (**10)**, Poland and Brazil **(12).** This might be related to the discrepancy in the level of medical service and life style between Egypt and these countries.

The patients' QoL scores were lower in females than males in our study, **Al-Gewely et al. (13)** reported that QoL scores were lower in males than females. Similarly, asthmatic boys were found to have lower QoL scores than asthmatic girls in Iran **(14)** and Brazil **(15).** and explained their findings by high prevalence, mortality, airway resistance and wide range of activities among males than females.

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Previous studies could not demonstrate a significant difference in the QOL scores between rural and urban residence **(13).** Also, **El-Gilany et al.(16)** and explained their findings by equal health awareness and accessibility of means of transportation to the nearby hospitals.

Our study significant relation between BMI and all of symptom, physical, emotional and overall (total) score of PQLQ.

Al-Gewely et al. (13) and (**El-Gilany et al. (16)** could not find a significant effect of increased BMI on QoL scores. The authors attributed to possibility of the presence of other factors that influence QOL of these children rather than body weight.

Higher QoL scores were observed in patients with working mothers reflecting possible better level of asthma control while mothers of children with less controlled asthma usually found a conflict between work and care for their children preferring to stay home. This is consistent with the findings of **(13).**

QoL scores in Patients with highly educated mothers and fathers in our study were higher than those with other levels of education. A higher caregiver educational level has been associated with the ability to care properly, greater appreciation of scientific knowledge, awareness about chronic diseases which leads to improvement of QoL scores among their children **(17).**

Similarly, previous studies reported that higher caregiver educational level is associated with higher QoL scores among their children in Egypt **(13 ,16),** and Brazil **(17).**

In this study, hat the patients' QoL scores were worse in those with lower level of asthma control ($p<0.05$)**.** Uncontrolled asthma is associated with more frequent symptoms, more limitations in activities that might exacerbate asthma attacks. Moreover, children with uncontrolled asthma are often worried about asthma attacks. Similar results were reported in previous studies on asthmatic children in Egypt **(Al-Gewely et al.(13)** and (**El-Gilany et al., (16)**.

A study limitation is related to its conduction among a sample of asthmatic children who had particular characteristics. Therefore, our patients were not representative of all asthmatics, which restrict the possibility of extrapolating our findings to the asthmatic population in general. Another limitation of our study is related to its cross-sectional design, and hence the long term effects of asthma on QoL of asthmatic children could not be evaluated.

CONCLUSION

PAQLQ in asthmatic children improve the quality of routine care and quality of life which is the principle goal of management.

There is statistically significant relation between residence, social class, BMI, mother education and occupation, father education, level of asthma control and the QoL of the asthmatic children. There is statistically non-significant relation with age, sex, family history of asthma, and parental smoking.

Therefore, asthmatic children and their families should be aware of the overall goal of asthma management is to achieve optimal disease control and HRQoL improvements.

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No Conflict of interest.

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