Original Article

Quality of Life and Its Accompanying Factors among Adult Female Patients with Chronic Bronchial Asthma

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Abstract

Background: *Asthma is a well-known chronic respiratory disease and a common global health problem. In Bangladesh, more than 100 million people are suffering from cough and shortness of breath. Patients with a known diagnosis of asthma are an important determinant of reduced quality of life.* **Objectives:** *To determine the quality of life and its accompanying factors among adult female patients with chronic bronchial asthma.* **Materials and methods:** *This cross-sectional study was conducted at the National Institute of Diseases of the Chest and Hospital, Dhaka from January to December 2021. Total eighty-five diagnosed adult female bronchial asthma patients were included in this study. Data were collected by face-to-face interviews with a semi-structured questionnaire using the Asthma Quality of Life Questionnaire (AQLQ) and Asthma Control Test (ACT) scale. The checklist was used for collecting data by reviewing medical records.* **Results:** *Among all the patients, the mean (±SD) age was 39.74±8.98 years and the highest frequency 48 (56.5%) patient's age were in the 31-45 years group. In this study, the mean AQLQ score was 3.55 so, it indicated a moderate degree of impairment of quality of life and the most affected domain was environmental stimuli. Among all patients, 52 (61.2%) had partially controlled asthma. The study finding showed that the level of impairment of quality of life decreased with the increase of age (p=0.001). Uncontrolled asthma was associated with a lower quality of life (p=0.001). The low educational level 25 (29.4%), residing in rural areas 26 (30.6%) and having comorbidity 44 (51.8%) adversely affected the level of AQLQ.* **Conclusion:** *Now a day's chronic bronchial asthma is a major public health issue, and it affects the quality of life. So, the current study may contribute to the prevention of worsening the level of impairment of quality of life in bronchial asthma patients.*

Keywords: Chronic bronchial asthma, Quality of life, Accompanying factors.

Introduction

Since 1948, when the World Health Organization (WHO) established a definition of health, as being not only the absence of disease and infirmity but also the presence of physical, mental, and social well-being[1]. The quality-of-life issue has been increasingly significant in healthcare practice and research[2]. Quality-of-life assessment measures changes in physical, functional, mental, and social health to evaluate the human and financial costs and benefits of new programs and interventions[3].

Quality of life is defined by the WHO as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns[4]. It is a wide-ranging concept that thoroughly considers a person's physical and mental well-being, amount of independence, social connections, and religious convictions, as well as their interactions with key environmental elements[4].

Asthma is the most common chronic non-communicable lung disorder in the world. It often begins in childhood and affects all ages. During childhood, boys have nearly twice the risk of developing asthma over girls but in adulthood there is a shift to a female predominance[5]. It's interesting to note that women tend to have more severe asthma[6].

Women with bronchial asthma are more likely than men to visit the emergency room for bronchial asthma-related issues, and having bronchial asthma in women is linked to higher mortality risk[7]. Many epidemiological studies suggest that women are at increased risk of developing adult-onset bronchial asthma and suffer from more severe disease than the men[8]. These gender differences appear to be the product of biological sex differences as well as the socio-cultural and the environmental factor differences[8].

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Around 300 million people currently have asthma in the world, and it accounts for about 1 in every 250 deaths worldwide and it is noted that there may be an additional burden of 100 million persons with asthma by 2025[9]. Over 18 million working days are lost due to asthma every year[9]. According to the National Asthma Prevalence Study (NAPS) about 7 million people are suffering from current asthma (i.e., three episodes of asthma attacks in the last 12 months) in Bangladesh[10]. The prevalence of asthma was found to vary from 4.3%-6.9% in the Indian subcontinent population[11]. In a time when high-quality asthma drugs are widely accessible, both asthma prevalence and mortality have risen[12]. While the prevalence of asthma is rising globally, there are differences between Bangladesh's epidemiology, clinical spectrum, and management approaches and those in the west[13].

The risks for developing asthma depend on a complex interaction of hereditary and environmental factors. Risk factors are genetic predisposition family history of atopy or asthma perinatal factors low birth weight, prematurity exposure to allergens; infections respiratory infections, especially those caused by respiratory syncytial virus environmental air pollution; tobacco smoke; diet and obesity[14]. Factors need to be identified to improve the quality of life of asthmatic patients. It is found that factors associated with a poor quality of life are obesity (24.9%), being female (28%), advanced age (21.7%), low education (56.5%), family history of asthma (24.4%), moderate persistent severity of asthma (36.4%), being a smoker (23.3%) and pets at home (24.4%)[15].

In the broad sphere of quality of life, there are sub-entities that influence how a person evaluates his or her own quality of life. Economic, spiritual, physical, psychological, and social factors all have a role[16]. Some of these sub-entities influence an individual's health and vice versa, some aspects of quality of life are directly influenced by an individual's health status[4]. Asthma negatively impacts the quality of life of the patients who suffer from it and the clinical and physiological parameters of bronchial asthma are not enough to understand and assess how the patients perceive their state of health[16].

So, the factors related to this aspect of the disease need to be identified to improve the quality of life of the patients. This study was undertaken to evaluate the factors accompanying with quality of life in asthma patients from a multidimensional perspective while attending the country's only national-level asthma center, which may aid in the planning of scientific and cost-effective asthma management in Bangladesh, thereby alleviating the suffering of thousands of asthma patients.

Materials & Methods

The study was a cross-sectional study. It was conducted at the National Institute of Diseases of the Chest and Hospital (NIDCH), Dhaka from 1st January 2021 to 31 December 2021 to determine the quality of life and its accompanying factors among adult female patients with chronic bronchial asthma. Permission for the study was taken from the Institutional Review Board of NIPSOM (NIPSOM/IRB/2021/18) permission form data collection was taken from the director of NIDCH (NIDCH/Aca/2021/324/2(7). Inclusion Criteria were diagnosed adult female bronchial asthma patients over the age of 18 years who were given consent to participate in the study. Exclusion Criteria were patients who had overlap syndrome (COPD plus asthma) or Tuberculosis and severely ill patients.

A convenient type of non-probability sampling technique was adopted for this study. Within the data collecting period, 85 samples were collected. After taking informed written consent from every patient, data were collected by face-to-face interview with a semi-structured questionnaire using the Asthma Quality of Life Questionnaire (AQLQ) & Asthma Control Test (ACT). Asthma Quality of Life Questionnaire (AQLQ) was created by Prof. Elizabeth Juniper and colleagues at McMaster University, Hamilton, Ontario, Canada. It was a disease-specific scale to measure the quality of life in patients with bronchial asthma aged above 17 years old. It consists of 32 questions and divided into four domains[17]. The purpose and objectives of the study were explained to the patients before the interview. The privacy and confidentiality of every patient were maintained strictly. In this study, after data collection and data processing, edited and analyzed according to the objectives and variables by IBM Software-Statistical Package for Social Science (SPSS) version 25.

Results

The socio-demographic characteristics of the patients included in this study are expressed in Table-I, Figure-1,2,3,4 and 5. The distribution of the patients by level of asthma control is shown in figure-6. Descriptive analysis of the accompanying factors with the quality of life of adult female chronic bronchial asthma patients are tabulated in Table-II. Findings related to Asthma Quality Life Questionnaire (AQLQ) are expressed in Table-III. The p-value of age group, educational qualification, residence, use of carpet at home, severity of asthma and having comorbidity with the comparison of mean total AQLQ score was statistically significant and the p-value of the presence of pets at home, family history of asthma with a comparison of mean total AQLQ score was not statistically significant (Table-IV).
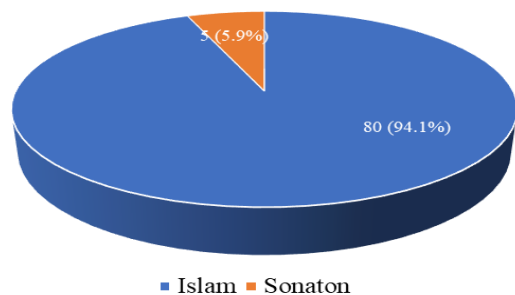
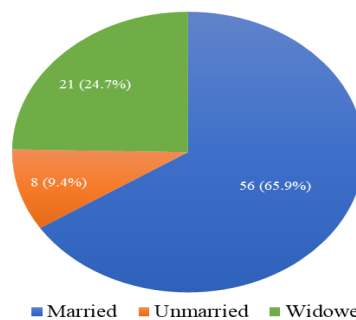**Figure-1: Distribution of the patients by religion (n=85)**

Figure 2: Distribution of the patients by marital status (n=85)

Table-I: Findings related to socio-demographic characteristics of patients (n=85)

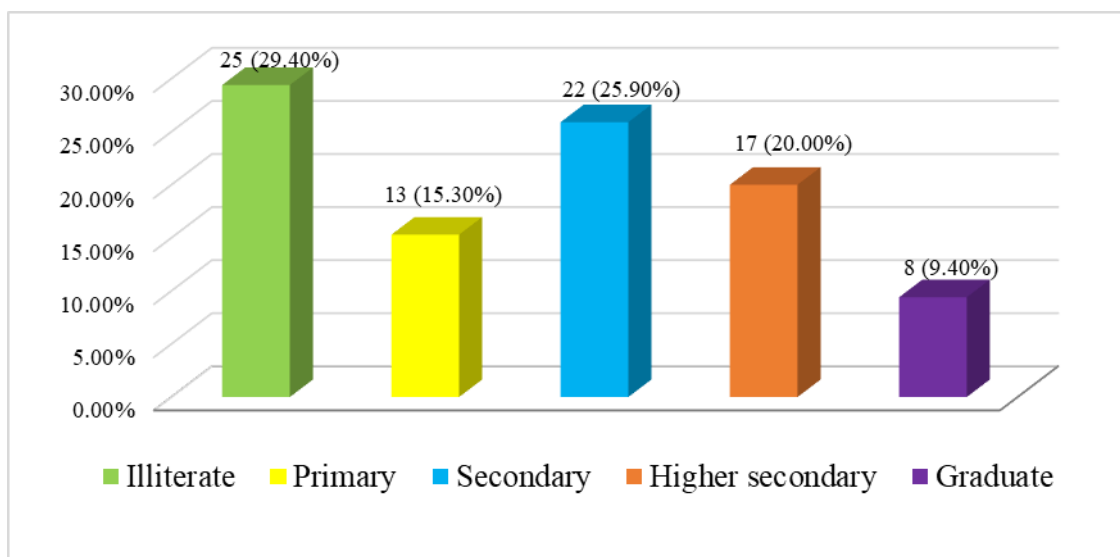| Characteristics	Frequency (n=85)	Percentage (%)	Mean ± SD
Age group (in years)			
18-30	14	16.5	
31-45	48	56.5	39.74 ± 8.98
46-60	23	27.1	
Occupation			
Homemaker	67	78.8	
Govt service	1	1.2	
Private employee	8	9.4	-
Student	9	10.6	
Monthly family income (in taka)			
10000-20000	17	20.0	
21000-35000	30	35.3	36882.35
36000-50000	27	31.8	±15137.78
51000- 70000	11	12.9	
Age of onset of asthma diagnosis (in years)			
10-20	79	92.9	
21-30	4	4.7	15.09 ± 5.31
31-40	2	2.4	
Duration of sufferings from asthma (in years)			
5-20	31	36.5	
21-35	47	55.3	24.60 ± 8.37
36-50	7	8.2	

Figure-3: Distribution of the patients by educational qualification (n=85)
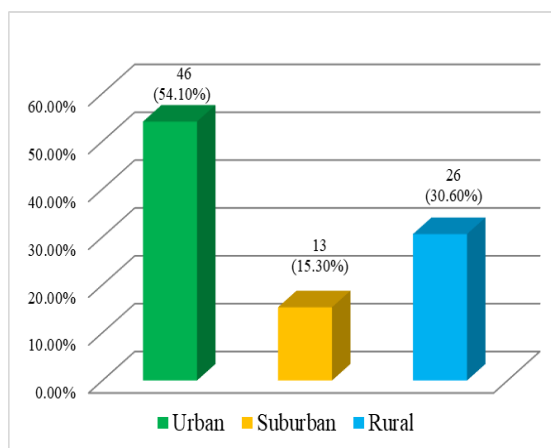
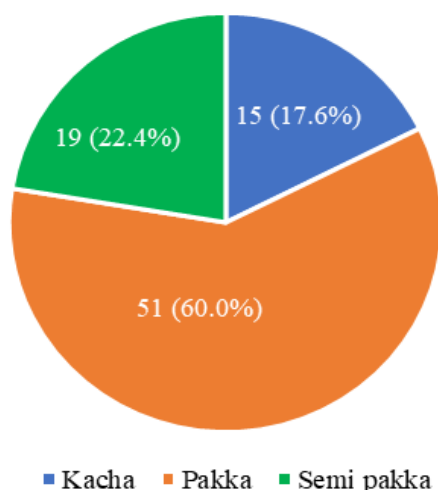**Figure-4: Distribution of the patients by residence (n=85)**

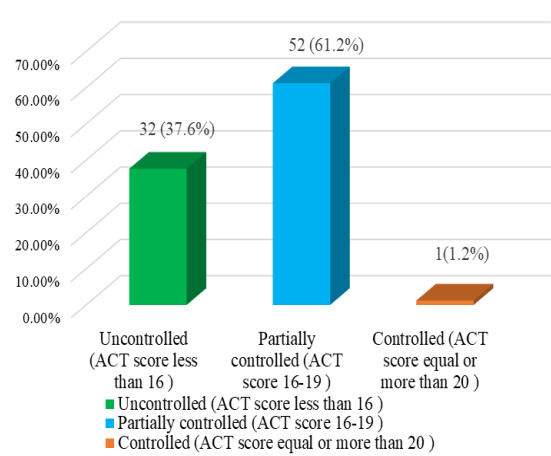**Figure-5: Distribution of the patients by accommodation (n=85)**

Figure-6: Distribution of the patients by level of asthma control (n=85)

Table-II: Findings related to the accompanying factors with the quality of life of adult female chronic bronchial asthma patients (n=85)

Characteristics	Frequency (n=85)	Percentage (%)
Use of carpet in the room		
None	68	80.0
Occasionally	12	14.1
Always	5	5.9
Presence of pets at home		
Yes	48	56.5
No	37	43.5
Use of air cooler in the room		
None	72	84.7
Occasionally	13	15.3
Use of face mask		
Yes	72	84.7
No	13	15.3
Family history of asthma		
Yes	74	87.1
No	11	12.9
Development of asthma symptoms during exercise		
Yes	40	47.1
No	45	52.9
Face masks effectiveness in cold weather		
Yes	77	90.6
No	8	9.4
Body Mass Index (BMI) category		
Under weight	7	8.2
Normal weight	39	45.9
Overweight	30	35.3
Obese	9	10.6
Having co morbidity		
Yes	44	51.8
No	41	48.2
Diabetes Mellitus		
Yes	34	40.0
No	51	60.0
Chronic kidney disease		
Yes	17	20.0
No	68	80.0
Hypertension		
Yes	27	31.8
No	58	68.2
Severity of asthma		
Severe persistent asthma	19	22.4
Moderate persistent asthma	36	42.4
Mild persistent asthma	23	27.1
Intermittent asthma	7	8.2

Table-III: Findings related to Asthma Quality of Life Questionnaire (AQLQ) (n=85)

Statistical Parameters	Overall AQLQ score	Activity limitation	Symptoms	Emotional function	Environmental stimuli
Mean	3.5533	3.3936	3.7931	3.5224	3.1441
Std. Deviation	1.08958	1.10314	1.20971	1.05021	1.00547
Minimum	1.81	1.45	1.83	1.20	1.50
Maximum	5.69	5.27	6.42	5.40	5.00

Table-IV: Comparison of mean total AQLQ score with different variables (n=85)

Variables	Mean total AQLQ score statistics	
Age group	F=7.540	p=0.001*
Educational qualification	F=7.152	p=0.001*
Marital status	F=4.834	p=0.010*
Residence	F=12.860	p=0.001*
Use of carpet at home	F=2.759	p=0.069
BMI categories	F=2.502	p=0.065
Severity of asthma	F=34.587	p=0.001*
Family history of asthma	t-test = 0.072	p=0.943
Presence of pet at home	t-test = 0.513	p=0.609
Use of face mask regularly	t-test = 2.965	p=0.004*
Use of air cooler in the room	t-test = -3.320	p=0.003*
Development of asthma symptoms during exercise	t-test = -8.137	p=0.001*
Having comorbidity	t-test = -4.059	p=0.001*
Diabetes	t-test = -2.989	p=0.004*
Chronic kidney disease	t-test = -3.390	p=0.001*
Hypertension	t-test =-2.501	p= 0.014*
Level of asthma control	F= 412.571	P= 0.001*

AQLQ score: Asthma quality of life questionnaire score, *Statistically significant

Discussion

This cross-sectional study was conducted amongst 85 diagnosed adult female bronchial asthma patients focusing on 3 age groups 18-30 years, 31-45 years, and 46-60 years. Maximum portions of patients 48 (56.5 %) age were between 31-45 years. The mean total AQLQ score was greater in patients <30 years compared to another age group. There was a significant relation between age and mean total AQLQ score (p=0.001) (Table-I, IV). The mean total AQLQ score was lower with the increase in the age of the patients. Similarly, the previous study from India reported that there was oldest age group with asthma had a significantly lower mean total AQLQ score than the younger age groups[18].

In this study in the context of the marital status of the patients, most of the patients were married 56 (65.9 %) (Figure-3). This finding agrees with a study on "predictors of asthma treatment adherence in rural Appalachian adults with asthma in West Virginia" and reported that 68.6% of the study participants were married[19]. It happened due to the

study that was done among adult bronchial asthma patients.

Regarding the educational level of the adult people with chronic bronchial asthma, this study revealed that the mean total AQLQ score was higher in those who passed higher secondary (4.2831±0.70913) followed by graduate, secondary, primary, and illiterate. There was a significant relation between the mean total AQLQ score and educational qualification (p=0.001) (Figure-2, Table-IV). That indicates the quality of life in asthma patients is better in educated people than in illiterate. In a previous study in Karachi, Pakistan lower health proficiency has been reported in patients with a lower education level[20].

Most of the patients in this study were from urban 46 (54.1%) and the rest of them were from rural 26 (30.6%) and suburban 13 (15.3%). The mean total AQLQ score was maximum in those who lived in the urban area. We found a significant relation between the mean total AQLQ score and residence

(p=0.001) (Figure-4, Table-IV). There was a common suggestion that AQLQ score in asthmatic patients would be lower in rural inhabitants than urban ones because of the difficulties in reaching medical health care centers, while urban people can probably attend medical facilities more easily and thus receive better care for their asthma. This was demonstrated in previous studies in Jordan, Serbia and Spain[21].

Out of 85 patients, 48 (56.5%) had pets at home. The mean total AQLQ score was higher in those who had pets at home (3.6068±1.07002). There was no significant relation between the mean total AQLQ score and having pets at home (p=0.609) (Table-II, IV). As in this study half of the participants belong to the urban area and they were well educated, they had knowledge about the careful handling of their pets, that's why pets did not contribute to poor quality of life. On other hand in a previous study reported pets at home were significant contributors to poor quality of life[20].

In this study, the mean total AQLQ score was maximum in those who were obese followed by overweight, normal weight and underweight. There was no significant relation between the mean total AQLQ score and BMI (p=0.065) (Table-IV). On the other hand, a previous study showed that overweight asthma patients had greater impairment in quality of life than patients with a normal BMI[22].

According to GINA (Global Initiative for Asthma) guideline 2020, level of asthma symptom controls out of 85 participants 52 (61.2 %) were partially controlled followed by 32 (37.6%) were uncontrolled and 1 (1.2%) were controlled. The mean total AQLQ score was maximum in those who were controlled followed by partially controlled and uncontrolled asthma. There was a significant relation between the mean total AQLQ score and the asthma control test (ACT) (p=0.001) (Figure-6, Table-IV). That indicates the quality of life in asthma patients improves when the asthma is controlled. In the previous study, they found a relation between asthma control and asthma-related quality of life. The mean asthma quality of life scores was significantly higher in patients achieving good control compared to patients who did not achieve control[23].

Among all participants, the overall AQLQ score ranged between 1.81 and 5.69 with a mean ± SD of 3.5533±1.08959 (Table-III). According to AQLQ, the best score is 7.0, which means that the patient has no impairments due to their asthma. However, once the score begins to drop below 7.0, this means that the patient is experiencing some degree of impairment even if quite mild. When the score of 1.0 is at the other end of the range it indicates severe impairment. 4.0 is right in the middle of the range which indicates a moderate degree of impairment[17]. As in this study, the mean AQLQ score was 3.55 so, it indicates a moderate degree of impairment.

In this study among four domains of the asthma quality of life questionnaire (AQLQ), the score of the environmental stimuli domain (3.1441±1.00547) was the most affected one. As the study was conducted in Dhaka city and most of the patients reside in urban areas, the amount of dust in the air is more. This increase in the amount of dust in the air acts as a contributing factor of aggravating asthma in our country. The previous study from Ethiopia reported that from the four domains the environmental mean score was the lowest domain[23]. That indicates asthmatic patients tend to be affected more by environmental stimuli than other domains.

Conclusion
Severe asthma has a great impact on the quality of life of patients and their families. The study findings suggested that uncontrolled asthma was linked to a considerable reduction in the quality of life of asthma patients. So, it is essential that patients take proper steps in the prevention of asthma symptoms and their accompanying factors to achieve a good quality of life.

Acknowledgment

Conflict of interest
The authors declared no competing interests.

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