

## Original Research Article

# Assessment of health-related quality of life in paediatric asthma patients

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## ABSTRACT

**Background:** Bronchial Asthma is one of the important chronic disease in children. This disease can affect the children mentally and physically in various aspects. Health related quality of life (HRQoL) has become an increasing important issue in the management of Asthma and it is how often used to evaluate the effectiveness of antiasthma drugs. The objectives of the study are to assess the health-related quality of life in Pediatric patients by using Pediatric Asthma quality of life questionnaire and also to assess the impact of parent education in health-related quality life of Asthma patient. The other intention of the study is to determine the anti-asthma drugs utilisation pattern in Pediatric patients.

**Methods:** This study was conducted in in-patient and out-patient department of tertiary care Hospital for a period of 1 year. 145 pediatric patients were participated in this study. A comparative study was conducted to describe the HRQoL in asthma and the pediatric asthma quality of life questionnaire is used to determine the HRQoL of the subjects. Statistical analysis was performed using the instant prism ANOVA test and the Bartlett's test. P <0.05 was considered statistically significant.

**Results:** This study shows that asthma is more common in male compared to female and most common type was Mild Persistent (47.85). Most of the patient are treated with bronchodilator (71%) followed by steroid (49%) and Leukotrien Antagonist (30.43%). Also revealed that most of the patients are taking multiple drug therapy compared to mono therapy. Quality of life having significant difference in all domains by comparing first visits score. Those suffering from the intermittent type of asthma showed higher mean quality of life score in all domains by comparing first visit score vs second visit score vs third visit score.

**Conclusions:** The health-related quality of life having improvement in all domain and overall quality of life by comparing the initial visit to the follow up visits. The patient education plays major role in improving the quality of life of pediatric population and the quality of life score having relationship with gender, age educational status, severity of asthma and the drug utilization improving health related quality of life.

**Keywords:** Bronchial asthma, HRQoL, Intermittent, Mild, Moderate, Severe persistent asthma

## INTRODUCTION

Asthma is a disease of airway inflammation and airflow obstruction characterized by the wheezing and cough together with bronchial hyper responsiveness.<sup>1</sup> In India 3-5% pediatric population is affected by asthma.<sup>2</sup> Asthma is

a chronic disease resulting in high mortality and morbidity. Health related quality of life (HRQL) has become an increasingly important issue in the management of asthma and it is now often used to evaluate the effectiveness of antiasthma drugs.<sup>3</sup> As expected, HRQL is worse among asthmatic than among

non-asthmatic children.<sup>4</sup> There are several specific questionnaires for estimating the HRQL of children with asthma, which can be answered either by the children themselves or by their parents. Although the severity of asthma is a factor affecting HRQL, there seem to be other relevant factors.<sup>5</sup>

Children with asthma are troubled not only by symptoms such as shortness of breath, cough and wheeze, they are also bothered by the physical, social, educational and emotional impairments that they experience as a result of having asthma.<sup>4,6</sup> The present study was conducted to study awareness and perception about dog bite among the population in the rural area of Maharashtra.

The aim of the present study is assessment of health-related quality of life in paediatric asthma patients in Malappuram District. The primary objective is to assess the health-related quality of life in paediatric asthma patients by using paediatric asthma quality of life questionnaire and Observe the impact of patient education in health-related quality of life asthma patients. The secondary objectives were to study the anti-asthmatic drug utilization pattern in paediatric asthma patients and to determine the relationship between health-related quality of life in gender, age, group, educational status, severity of asthma, income and anti-asthmatic drugs.

## METHODS

This study was conducted in in-patient and out-patients department of Mes Medical College Hospital. It is tertiary care hospital in Perinthalmanna, Malappuram Dist, Kerala, with 750 bedded multispecialty hospitals. Duration of study was 1 year.

Study population consist of 145 asthmatic patients. A comparative study was conducted to describe the HRQoL in asthma and the paediatric asthma quality of life questionnaire is used to determine the HRQoL of the subjects.

### *Inclusion Criteria*

- Patients aged 7\_17 years
- Paediatric patient with asthma or symptoms of asthma
- In -patient asthmatic patients
- Out- patient asthmatic patients

### *Exclusion Criteria*

- Patients aged 0-6 years.
- Age above 17 years.
- Children they had illness other than asthma that affect the quality of life.
- Children had recurrent chest infection requiring treatment with antibiotics.
- ICU patients.

## *Data Collection Tool*

The data are collected in the patients first visit, Second visit and Third visit. The first visit the patient or parent will sign informed consent form and asking the paediatric asthma quality of life questionnaire. The patients will selecting response from the response sheets and educating the patients. The data collection of quality of life questionnaire is continuing the second visit and third visit.

## *Questionnaire form*

The Questionnaires is sending Elizabeth F. Juniper, MCSP MSc, professor Emeritus, Department of clinical Epidemiology and Biostatistics, McMaster University, Canada through air mail.

Questionnaires are prepared based on the paediatric asthma quality of life questionnaire. The patients were requested to answer a questionnaire the questions are following: how bothered have you been during the last 7 days doing? Physical activities, being with animals, activities with friends and family, coughing, worried because of your asthma, asthma attacks, wheezing, feel short-tempered, tightness in your chest, feel disappointed because you could not do just as others, wake up during the night, feel uncomfortable, feel difficulty in breathing, have trouble sleeping at night, feel very afraid because of an asthma attack, how much were you bothered by your asthma doing these activities have difficulty to take deep breath.

The paediatric asthma quality of life questionnaire having 23 questions. The questions are divided into three domains. The domains included activity limitation, symptoms, emotional function. Activity limitations having 5 questions, symptoms having 10 questions, emotional function having 8 questions. The health-related quality of life is measured by overall quality of life in patients. The quality of life also calculated by domains wise.

The first and second part of the study was a prospective analysis of files to document the HRQoL in paediatric asthma patients. All of the questionnaires in the study was those who affected asthma and its risk factors within the last 10 months period prior to the interview. In this study we are enrolled 138 patients according to inclusion criteria. All information was obtained through face-to-face interview. Questions were repeated and seek the information from the patients during the subsequent months. The questionnaire will take 10-20 minutes to complete the first visit and approximately 12 minutes to follow up visits.

## *Data processing and analysis*

The 23 questions in the PAQLQ(S) are divided into three areas or domains

**Domains Questions**

Activity limitations 1,2,3, 19,22

Symptoms 4,6,8,10,12,14,16,18,20,23

Emotional function 5,7,9,11,13,15,17,21

Individual questions are equally weighted. The overall PAQLQ score is the mean of the responses to each of the 23 questions.

Therefore, add all 23 responses together and divide the total by 23. The resultant overall score will be between 1 and 7. The domains are analysed in exactly the same way. Add the responses for each of the items in the domain and then divide by the number of items in the domain. Therefore, the scores from a domain with five items and a domain with ten items will both be between 1 and 7.

Statistical analysis was performed using the instant prism ANOVA test, the Bartlett's test.  $P < 0.05$  was considered statistically significant. Values are shown with the Mean and standard deviation (+ SD).

**RESULTS**

The present study was carried out in in-patient and out-patient department of MES Medical College Hospital Perinthalmanna, Malappuram Dist, Kerala. We are enrolled 145 patients according to the inclusion criteria.

**Demographic characteristic details**

This study shows that childhood asthma was more common in male's patient (60%) and less in female patients (40%). Male child patients are frequently affected with asthma than female child patients. The patient aged between 7-10 (57.97%) is more prone to asthma when compare to the other age groups.

**Characteristics of asthmatic patients**

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Study shows that the disease severity most of the patients are found to be mild persistent (47.82%). Most of the patient family is low class family. The family history of paediatric asthma patients having high (62.31%) due to the family history most of the paediatric asthma patients are affected.

**Symptoms of asthmatic patient****The prevalence of asthmatic symptom in children**

This study also shows that most among the asthmatic patients the symptom of shortness of breath is regularly affected by patient (69.56%) and then coughs (60.14%). This study shows that most of the clinical manifestation is shortness of breath and then cough

**Distribution of patient therapy**

From the study most of the male patients are more prone to mono therapy (52.17%) and combination therapy (18.84%) as compared to females. This table concludes males are more prone to drug therapy as compare to females.

As the males are more prone to paediatric asthma compare to females and also shows that child patient aged between 7-10 is more prone to mono therapy (49.27%) and combination therapy is (8.69%) and 11-14 aged patients' mono therapy (13.11%) combination therapy (12.31%) 15-17 aged patients mono therapy (4.34%) combination therapy (7.2%)

**Utilization of common drugs in asthma**

Most of the patients are treated with bronchodilator oral (71.01%) followed by antibiotics (57.24%), corticosteroids oral (49.27%) and leukotriene antagonist (30.43 %). The antibiotics are used to treating the respiratory tract infections.

**Table 1: Relationship between PAQLQ age group.**

Age group	Domains	1 <sup>st</sup> visit score	2 <sup>nd</sup> visit score	3 <sup>rd</sup> visit score
7-10	Symptoms	2.62±0.48	3.69±0.89***	4.63±0.97***
	Activity limitation	3.32±0.50	4.43±0.48***	5.01±1.05***
	Emotional function	2.78±0.50	4.01±0.44***	5.25±0.85***
	Overall	2.90±0.42	4.04±0.68***	4.96±0.97***
11-14	Symptoms	3.14±0.61	4.28±0.66***	5.59±0.99***
	Activity limitation	3.30±0.48	4.36±0.71***	5.43±0.96***
	Emotional function	2.93±0.57	4.45±0.76***	5.76±0.87***
	Overall	3.12±0.53	4.36±0.76***	5.59±0.98***
15-17	Symptoms	2.98±0.49	5.62±0.68***	6.08±0.72***
	Activity limitation	3.67±0.98	4.63±0.97***	5.95±1.08***
	Emotional function	3.23±0.73	4.86±1.06**	6.09±0.75***
	Overall	3.42±0.68	5.03±0.97***	6.04±0.66***

Values are given as Mean + SD, \*\*P value is < 0.05 significant, \*\*\*P value is < 0.001 extremely significant

**Table 2: Relationship between PAQLQ score and severity of asthma.**

Severity of asthma	Domains	1 <sup>st</sup> visit score	2 <sup>nd</sup> visit score	3 <sup>rd</sup> visit score
Intermittent persistent (44)	Symptoms	3.30±0.66	4.51±0.59***	6.50±0.58***
	Activity limitation	3.51±0.51	4.87±0.38***	6.59±0.37***
	Emotional function	3.58±0.57	4.88±0.49***	6.61±0.41***
	Overall	3.45±0.58	4.75±0.45***	6.56±0.39***
Mild persistent (66)	Symptoms	2.60±0.35	3.94±0.85***	5.36±1.0***
	Activity limitation	3.29±0.35	4.48±0.59***	6.16±0.79***
	Emotional function	3.33±0.25	4.58±0.55***	6.31±0.63***
	Overall	3.05±0.27	4.32±0.61***	5.93±0.82***
Moderate persistent (28)	Symptoms	2.37±0.30	3.55±0.64***	5.02±0.71***
	Activity limitation	2.77±0.60	3.88±0.68***	5.45±0.73***
	Emotional function	2.92±0.72	4.11±0.70***	5.64±0.66***
	Overall	2.68±0.53	3.84±0.58***	5.38±0.57***

Values are given as Mean + SD, \*\*P value is < 0.05 significant, \*\*\*P value is < 0.001 extremely significant

### **Relationship between PAQLQ score and age group**

#### *Utilization of anti-asthmatic drugs*

Shows that the pattern of drug Prescription in asthmatics showed the highest prevalence of  $\beta$ -agonist followed by corticosteroids and leukotriene antagonist, and most of the patients received multiple drug therapy compared to single drug therapy. In multiple drug therapy, two drug combinations were as more widely prescribed than combinations of three/four drugs.

### **Relationship between PAQLQ score and other variables**

#### *Relationship between PAQLQ score and gender*

Study shows that the quality of life having significant difference in all domains by comparing first visit score Vs second visit score and first visit score Vs third visit score, the quality of life score having improvement in male than female.

Table (1) shows that quality of life score having significant difference in all domains by comparing first visit score Vs second visit score and first visit score Vs third visit score, the quality of life having association with age groups. The age group 15-17 having improvement in quality of life, when compare to other age groups first visit score second visit score and third visit score.

#### **Relationship between PAQLQ score and severity of asthma**

Table (2) shows a statistically significant difference was observed between patients with intermittent asthma and those with mild and moderate asthma. Those suffering from the intermittent type of asthma showed higher mean quality of life scores in all domains, in comparison first visit score, second visit score and third visit score with their counterparts with mild and moderate asthma.

### **DISCUSSION**

Children with asthma are troubled not only by symptoms such as shortness of breath, cough and wheeze, they are also bothered by the physical, social, educational and emotional impairments that they experience as a result of having asthma. In response to the need for an instrument to measure health related quality of life (subsequently referred to as quality of life) in children with asthma.<sup>7</sup> This study attempted to estimate the health-related quality of life in paediatric asthma patients by using paediatric asthma quality of life questionnaire. And how the patient education will affect the health-related quality of life of paediatric asthma patients.

In present study sex wise distribution, the male patients are more prevalence when compare to the female patients. The study of Rijssenbeck-Nouwens L H et al also shown that early childhood asthma is more common among males, but after puberty the incidence in females and decreases in males.<sup>8</sup> In addition, asthma after childhood is more severe in females than in males. In my study also correlated to that of previous study.<sup>9</sup> The patients who are in age between 7-10 years are more prone to asthma when compare to other age groups. The study of Christie MJ et al. shows that the children have aged between 6-10 are more prone to asthma. In this age the children are more exposed to allergic materials.<sup>10</sup>

Among this study the prevalence of asthma was higher in lower primary (5.17%) when compare to the other educational status patients. and most of the patients are affecting mild persistent asthma and the most patients low class family.

Due to the family history most of the patients are affecting the childhood asthma. Study of Harju T et al found that the prevalence of asthma was higher in pre-school ages.<sup>11</sup> In the previous study in Tehran (1995), the prevalence of asthma was higher in pre-high school, similar to present study.<sup>11</sup>



In present study most among the asthmatic patients the symptoms of shortness of breath is regularly affected by patient (69.56%) and cough (60.14%). The most of the clinical manifestation is shortness of breath and the cough. Previous study of Roberts G et al also shows the same result.<sup>12</sup> According to present study most of the male patients are more prone to monotherapy (52.17%) and combination therapy (18.84%) as compared to females. These children aged between 7-10 is more prone to mono therapy (49.27%) and the combination therapy is (8.69%). The findings of Kanter LJ et al study is consistent with present study.<sup>13</sup> Drug utilization of common drugs in asthma most of the patients are treated with bronchodilator oral (71.01%) followed by antibiotics (57.24%), corticosteroids oral (49.27%) and leukotriene antagonist (30.43%).

The drug utilization of anti-asthmatic drugs the highest prevalence of  $\beta$ -agonist followed by corticosteroids and leukotriene antagonist. The corticosteroids are mainly giving in mild and moderate persistent asthma patients. Lazarus SC study was found to be beta-agonist were the most frequently prescribed anti- asthmatic drugs followed by methylxanthine, corticosteroids and leukotriene antagonist in present study also correlated to that of previous study.<sup>14</sup>

In present study most of the patients received multiple drug therapy compared to single drug therapy. In multiple drug therapy, two drug combinations were as more widely prescribed than combinations of three/four drugs. Anderson HR et al study was found to be multiple drug therapy was opted for a significant number of patients as compared to single drug therapy. In present study also correlated to that of previous study.<sup>15</sup> Among present study the quality of life score having significant difference in male compare to female in all domains and overall score. The patient education male patients are more responding than female patients. Study of Kanter L J et al, Juniper EF et al also shown that girls had a slightly lower mean PAQLQ score than boys. In present study also similar to that of study.<sup>16,17</sup>

According to demographic details in age group (15-17 years) and educational status (higher secondary) has improvement in quality of life compare to other groups because their having awareness about asthma disease and the patient education to (15-17 years) patients are more effective and they will be taking regular medications.<sup>18</sup> In present study the health-related quality of life score having significant difference between patients with intermittent asthma and those with mild and moderate asthma. Those suffering from the intermittent type of asthma showed higher mean quality of life scores in all domains in comparison with their counterparts with mild and moderate asthma. Study of Robert G et al also shown that those suffering from the intermittent type of higher mean quality of life score in all domains in comparison with their counterparts with mild to moderate asthma.<sup>19</sup>

The quality of life score having improvement in rich patients (income >15,000) Because of the patients will take regular medication and healthy foods, the patients more supporting the patient education and following the instructions. Study of Khot A et al, 1984 also shown that household income was related to quality of life.<sup>20</sup>

## CONCLUSION

This study has shown that the paediatric asthma quality of life questionnaires is easy to understand. It provides information on the different aspects of health-related quality of life that is troublesome to children with asthma (symptoms, emotions and activity limitations).

The health-related quality of life having improvement in all domains and overall quality of life by comparing the initial visits to the follow up visits. The patient education plays major role in improving the quality of life of paediatric population, and the quality of life score having relationship with gender, age, educational status, severity of asthma, income, and the drug utilization improving health related quality of life. The common drug utilization pattern of the patients was oral bronchodilator followed by antibiotics, corticosteroids and leukotriene antagonist. The drug utilization pattern of anti-asthmatic drugs showed the highest prevalence of  $\beta$ -agonist followed by corticosteroids and leukotriene antagonist.

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