IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 21, Issue 4 Ser.3 (April. 2022), PP 28-32
www.iosrjournals.org

Evaluation of quality of life in Children and Adolescents with asthma

Vinícius Urbanowiski Ramos[1], Bruna Diniz Neiva Giorgenon[1,] Fabiano Sandrini[2], Mafalda Lucia Kuhn[3], Gleice Fernanda Costa Pinto Gabriel[4], Marcos Antonio da Silva Cristovam[4]

[1]*Pediatric Resident Physician, 3rd year, at Hospital Universitário do Oeste do Paraná, Cascavel, PR, Brazil.*
[2] *Ph.D. Assistant Professor of Pediatrics, Medical School at Western Paraná State University, Cascavel, PR, Brazil.*
[3]*Pediatric physician with expertise in pediatric pneumology at the Specialized Center for Child and Adolescent Health Care, Cascavel, PR, Brazil.*
[4] *M.D. Assistant Professor of Pediatrics, Medical School at Western Paraná State University, Cascavel, PR, Brazil.*
CorrespondingAuthor: Marcos Antonio da Silva Cristovam
Rua João de Mattos 1145, bloco B, apto 09, Coqueiral, Cascavel, PR, Brazil

Abstract
Background:*Asthma is the most common chronic disease in children and adolescents. Poor asthma control can have a negative impact on emotional, social and physical aspects of the children's life.*
Objective:*To evaluate the quality of lifeand its association with the level of asthma control in children and adolescents with asthma.*
Methods: *It was an analytical cross-sectional study that included asthmatic children and adolescents, from a Public Pediatric Pneumology Clinic in CascavelCity, Brazil. The Pediatric Asthma Quality of Life Questionnaire (PAQLQ), validated for use in Brazil, was applied to assess the patient's quality of life. Asthma control was evaluated by the questionnaire based on the Global Initiative for Asthma (2021). Data were summarized using descriptive statistics. Chi-square and Fisher's Exact Tests were used to identify associations between quality of life and disease control. Multiple Linear Regression model was performed to determine if there was relationship betweenthe variables: age, gender, asthma control and the quality of life scores. The level of statistical significance was p<0.05.*
Results: *76 children and adolescents participated in the study; 40 females (53%) and 36 males (47%);agedfrom 7 to 17 (mean: 9.6 years old). 63 patients (82.9%) were classified as having controlled asthma (CA) and 13 (17.1%) had partially controlled (PCA) or uncontrolled asthma (UA). The asthma symptoms control determined the general scores. The CA group presented significantly values for the overall PAQLQscore when compared to the PCA + UA group.Patients with poor asthma control had impairment in mean quality of life scores in the Activity Limitation and Symptoms domains. The latter was the most affected domain, with lower scores and more patients reporting moderate or severe impairment in quality of life. Nonetheless, theasthma control had no significant impacton Emotional Function domainscores.*
Conclusions: *Asthmatic children and adolescents with poor asthma control have impaired quality of life, especially in the symptoms domains. The small number of patients with UA in the study samplemay have influenced on the absence of impact on Emotional function scores.*
Keywords: *asthma; quality of life; child; adolescent.*

Date of Submission: 02-04-2022 Date of Acceptance: 15-04-2022

I. Introduction

Asthma is a chronic inflammatory disease of the airways,with diverse clinical manifestations, usually characterized by two key elements: a history of respiratory symptoms (such as wheeze, shortness of breath, chest tightness and cough, especially at night or on waking) associated with variable expiratory airflow limitation[1]. Asthma is a serious public health problem, affecting an estimated 332 million people worldwide [2]. In Brazil, although in the last two decades less hospital admissions due to asthma have been reported and a decrease in its lethality rate in pediatric patients have been observed, it remains the most common chronic disease among children and adolescents[3].

One way to categorize asthma is according to the control level of its clinical manifestations[1].Poor asthma control can have negative effects and bring about limitations in the emotional, social and physical aspects of the patient´s life. Furthermore, in the pediatrics age range, it may also have an impact on the caregivers´quality of life (QoL),due to alterations in the family routine[4].

Symptoms, emotions, level of activity limitation, school absenteeism and hospital admissions of asthmatic chidren might be analysed to evaluate their QoL. Such information is addressed in the Pediatric Asthma Quality of Life Questionnaire (PAQLQ), an instrument that enables the QoL evaluation inthe pediatric patient with asthma and that is already validated in Brazilian Portuguese. Based on this characterization and on the asthma control level, it is possible to elucidate how these two factors are related, thus making the health professionals aware of this association, in order to stablish therapeutic strategies that will lead to better clinical evolution for the patient. [5].

The aim of this study was to evaluate the quality of life according to the level of asthma control in children and adolescents diagnosed with asthma and treated at a reference center for this disease.

II. Method

This was an observational, cross-sectional, analytical clinical study conducted over a period of six months, from June to November/2021, at a public Pediatric Pneumology Clinic, in Cascavel City, Paraná, Brazil.

The study included all children aged 7-17 years old with physician-diagnosed asthma who attended the Clinic during the mentionedtime period.

The asthma control level was evaluated following the recommendations provided by the Global Initiative for Asthma (GINA, 2021) [1], based on the answers to four questions about whether the following signs were present in the four weeks prior to the interview: activity limitation, daytime asthma symptoms more than twice a week, night waking due to asthma and use of asthma reliever medication more than twice a week. If the patient's replies to all questions were negative, asthma would be classified as well controlled (WCA); for those with only one or two negative replies, asthma was sorted as partly controlled (PCA); if three or more questions received negative answers, the asthma was considered as uncontrolled (UA).

The Pediatric Asthma Quality of Life Questionnaire (PAQLQ), validated for use in Brazil, was the instrument chosen to assess the Quality of Life (QoL).It consists of 23 questions sorted into three domains. The Activity Limitation domain (AL)comprehends five questions regarding the discomfort caused by the disease during certain activities; the Symptoms domain (S) includes 10 questions concerning the malaise that asthma attacks, cough, dyspnea, wheezing, chest tightness and night waking engender in children and adolescents; and the Emotional Function domain (EF) comprises 8 questions exploring the frequency at which asthma made the patients feel angry, afraid, different, excluded, irritated or upset for not being able to keep pace with their pairs. Results are determined on a 7-point scale, in which 1 point indicates the most severe impairment and 7 points suggest no impairment at all. Equal weights were assigned to all questions. By the end, besides the domain scores, a general score was calculated using the arithmetic mean of the 23 answers. In order to evaluate how much the level of asthma symptom control interferes in the QoL of children and adolescents included in the study, based onthe PAQLQ scores, the patient's QoL was classified as follows: minimal or no impairment (≥ 6); moderate impairment (3.0 to 5.9 points) and severe impairment (≤ 2.9) [5].

Data were analyzed with the software Stata/SE v.14.1StataCorpLP.USA, 2020. Categorical variables were evaluated by Fisher's Test. The independent samples Student's T-test was used to compare two classes of a variable in relation to quantitatives variables, and the Chi-square test was used to identify the association between two qualitatives variables. The Multiple Linear Regression model was used to determine the relationship between multiple variables (gender, age, and asthma control) and the PAQLQ scores. The asthma control variables were dichotomized into "Controlled asthma" and "Partially controlled/Uncontrolled asthma". P values lower than 0.05 indicated statistical significance.

Patients with cognitive limitations that could compromise the test's execution or comprehension were excluded from the survey.

This study was submitted to and approved by the Research Ethics Committee of theWestern Paraná State University (Rulling nº 4.637.484/2021).

III. Results

101 (100%) children diagnosed with asthma who attended at the public Pediatric Pneumology Clinic during the period of the study were evaluated. 76(75.2%) were selected based on the inclusion criteria.

The age ranged from 7 to 17 years (mean: 9.6 years, median: 9). 36 (47%) were male and 40 (53%) were female.

Participants were sorted into three groups according to the asthma control level: Well Controlled Asthma (WCA), Partially Controlled Asthma (PCA) and Uncontrolled Asthma (UA), which included 63

(82.9%), 10 (13.2%) and three (3.9%) children, respectively. Considering the unrepresentative sample of individuals with uncontrolled asthma, it was chosen to unify the PCA and the UC group to perform the statistical analysis. Therefore, by the end there were only two major groups: WCA (n=63) and PCA + UA (n=13).

No association between gender and asthma control (p=0.104) or between age and asthma control was found (p=0.282).

The distribution of quantitatives variables of the overall PAQLQ score, as well as of the scores for the Activity Limitation (AL), Symptoms (S) and Emotional Function (EF) domains of the PAQLQ is shown in Table 1.

After evaluating the joint association between age and overall score (p=0.574) and age and AL (p=0.561), S (p=0.240) and EF (p=0.472) scores, as well as the joint association between gender and overall score (p=0.754) and gender and AL (p=0.750), S (p=0.644) and EF (p=0.126) scores, no correlation was found. As for the joint association of asthma control and the overall score (=0.003), S score (p<0.001)and EF score (p=0.016), considering the variables age and gender, correlation was found, but not referring to the AL score (p=0.056), although a certain tendency to it could be noticed.

Table1. *Distribution of the values for the Pediatric Asthma Quality of Life Questionnaire components, by level of asthma control.*

Variable	Group	Mean	Minimum	Median	Maximum	SD	p
Overall	WCA	6.4	2.8	6.5	7	0.7	0.014
	PCA + UC	5.4	3.4	6	6.6	1.2	
PAQLQ-AL	WCA	6.0	2.8	6.2	7	1.0	0.050
	PCA + UC	5.4	4.4	5	7	0.8	
PAQLQ-S	WCA	6.4	2.9	6.7	7	0.7	0.007
	PCA + UC	5.1	2.5	5.2	6.8	1.5	
PAQLQ-EF	WCA	6.5	2.8	7	7	0.9	0.121
	PCA + UC	5.8	2.3	6.5	7	1.5	

WCA: Wel lControlled Asthma; PCA: Partially Controlled Asthma; and UC: Uncontrolled Asthma..AL: Activity limitation; S: Symptoms; and EF: Emotional function.

The distribution of the degree of impairment reported by the participants according to PAQLQ's overall and domains scores, byasthma control level, is presented on Table 2.

Table 2.*Distribution of the cases by level of asthma control and by degree of impairment reported in the components of the Pediatric Asthma Quality of Life Questionnaire.*

Variable	WCA n (%)	PCA + UA n (%)	Cases n	p
Cases	63 (82.8)	13 (17.2)	76	
Overall				
Minimal or no impairment	51 (80.95%)	7 (53.85%)	58	
Moderate impairment	11 (17.46%)	6 (46.15%)	17	0.072
Severe impairment	1 (1.59%)	0	1	
Activity limitation				
Minimal or no impairment	40 (63.4%)	4 (30.7%)	44	
Moderate impairment	22 (34.9%)	9 (69.2%)	31	0.045
Severe impairment	1 (1.5%)	0	1	
Symptoms				
Minimal or no impairment	53 (84.1%)	5 (38.4%)	58	
Moderate impairment	9 (14.2%)	7 (53.8%)	16	0.001
Severe impairment	1 (1.5%)	1 (7.6%)	2	
Emotional Function				
Minimal or no impairment	56 (88.8%)	8 (61.5%)	64	
Moderate impairment	6 (9.5%)	4 (30.7%)	10	0,050
Severe impairment	1 (1.5%)	1 (7.6%)	2	

WCA: well controlled asthma; PCA: partially controlled asthma; and UC: uncontrolled asthma.

IV. Discussion

Evaluating the quality of life (QoL) of asthmatic children and adolescents is a way to complement the analysis of clinical signs, allowing the professional to have a better perception of the impact the disease and its treatment have on the patients' well-being[6].

In this study, an association between the general QoLindicators and the asthma control level in children and adolescents was found, as well stablished in literature [4-15]. This suggests that patients with WCA have less impairment in social interaction and lower frequency of clinical, physical and emotional signs. Asthma symptoms control is recognized as the best predictor of QoL of asthmatic children. [8].

The current findings show correlation between the"activity limitation" domain and asthma symptoms control, corroborating existent literature's results[6, 16]. Nonetheless, part of this studies reported that this domain was less affected than the others[16, 17].On the other hand, previous researchers demonstrated that this was the most affected domain, with the lowest average scores [4, 5, 9]. This contradiction of the perception of asthma impact on activity limitationis attributed by certain authors to the variation in physical activity levels of the individuals in the sample, even though recent research has not found any association between this variable and QoL or asthma control[18]. The limited concepts that asthmatic children have about themselves, as well as the parents' and caregivers' concerns about the risks of exercising may explain the relation between this domain and asthma control level [9]. Patients with uncontrolled asthma symptoms may avoid some activities, fearing to exacerbate the disease or trigger an asthma attack[16].

The "symptoms" (S) domain was also correlated to asthma control. Previous studies found similar results, with lower scores in this domain [6,19]. It is possible to find a greater impact of the S domain on QoL perception in samples whose patients have worse asthma control levels (related to more frequent symptoms and use of rescue medication)[6], even though it is not the case of the current study.

No correlation between asthma control and emotional function was found. Although two studies conducted in India reported improvement in all domains after the disease control, the authors emphasized that the improvement in the emotional domain was not as high as in the others, a result similar to our findings[4, 16]. Other authors have found that the worse the asthma control, the more present anxiety symptoms associated to emotional function were, and the worse the QoL would be[21]. One study from Nigeria and another from Bosnia-Herzegovina reported this domain as the most affected[17,20].

There is divergence in the literature about which domain of the PAQLQ has the greatest influence on perceived quality of life. This perception might be influenced by cultural aspects, level of physical activity, and inclusion and exclusion criteria of each study [5].For Banjari et al., all domains were equally affected [7].

"Activity Limitation" and "Symptoms" were associated to impairment degree. Patients with greater impairment of QoL in these domains were more prone to have partially controlled/uncontrolled asthma.These results are similar to those found in other papers [5,6]. It is interesting to notice that objective questions are used to classify the patients in the symptoms control categories, while there is some subjectivity in the answers to the QoL questionnaire. This could explain the severe impairment reported by a patient sorted in the "Controlled Asthma" group.

This study had one limitation: the non-representative number of patients with uncontrolled asthma in the sample may have influenced the lack of significance in the specific domain "emotional function".

V. Conclusion

The study revealed that asthmatic children and adolescents with poor asthma control had impaired quality of life, especially in the Symptom's domain, which was the most affected. Including the PAQLQ in the evaluation of asthmatic children may be an important strategy to provide the health professionals with information about the impact of asthma on pediatric patient's quality of life.

References

[1]. Global Initiative for Asthma. Global strategy for asthma management and prevention. Fontana, WI: Global Initiative for Asthma; 2021 [cited 2022 Jan 15]. Available from: https://www.ginasthma.org/reports

[2]. The Global Asthma Report 2018. Auckland, New Zealand: Global Asthma Network, 2018. [cited 2022 Jan 15]. Available at: www.globalasthmareport.org.

[3]. Fonseca LG, Florêncio RB, Lima IN, Gualdi LP. Time trend of Brazilian hospital admissions and deaths due to asthma among children and teenagers, 1998–2019. PLoS ONE. [Internet]. 2021 [cited 2022 Jan 15];16(3):e0248472. Available from: https://doi.org/10.1371/journal.pone.0248472.

[4]. Battula M, Arunashekar P, Vinoth P. A Prospective Study to Assess the Quality of Life in Children with Newly Diagnosed Asthma and Their Caregivers using the Pediatric Asthma Quality of Life Questionnaire. J Prim Care Com Health. 2020;11:1-7.

[5]. Matsunaga NY, Ribeiro MA, Saad IA, Morcillo AM, Ribeiro JD, Toro AA. Evaluation of quality of life according to asthma control and asthma severity in children and adolescents. J Bras Pneumol. 2015;41(6):502-8.

[6]. Fontan F, Duwe S, Isoppo KS, Da Silva J. Quality of life evaluation and associated factors in asthmatic children and adolescents attended in a specialized outpatient clinic. Rev Paul Pediatr. [Internet]. 2020 [cited 2022 Jan 15];38:e2018172. Available from: https://doi.org/10.1590/1984-0462/2020/38/2018172.

[7]. Banjari M, Kano Y, Almadani S, Basakran A, Al-Hindi M, Alahmadi T. The Relation between Asthma Control and Quality of Life in Children. Int J Pediatr. [Internet]. 2018 [cited 2022 Jan 15];2018:1-6. Available from: https://doi:10.1155/2018/6517329.

[8]. Dardouri M, Sahli J, Ajmi T, Mtiraoui A, Bouguila J, Mallouli M. Quality of Life Determinants in Children and Adolescents with Mild to Moderate Asthma in Tunisia. Comprehensive Child and Adolescent Nursing, [Internet]. 2020 [cited Jan15];39(1):1–11. Available from: https://doi:10.1080/24694193.2020.178.
[9]. Furtado PR, Maciel AC, Barbosa, RR. Silva AA, Freitas DA, Mendonça KM. Association between quality of life, severity of asthma, sleep disorders and exercise capacity in children with asthma: a cross-sectional study. Braz J Phys Ther. 2018;23(1):12-18.
[10]. Garina LA, Grahadinta MR, Mansoer FA, Puspitasari I. The Quality of Life on Asthmatic Adolescent and Its Correlation with the Severity and Control of Asthma. Glob Med Health Commun. 2020;8(1):53–8
[11]. Karadeniz P, Özdoğan Ş, Ayyıldız-Emecen D, Öncül Ü. Asthma control test and pediatric asthma quality of life questionnaire association in children with poor asthma control. Turk J Pediatr. 2016;58(5):464-472.
[12]. Lozier MJ, Zahran HS, Bailey CM. Assessing health outcomes, quality of life, and healthcare use among school-age children with asthma. Journal of Asthma. 2018;56(1):1–8.
[13]. Montalbano L, Ferrante G, Montella S, Cilluffo G, Di Marco A, Bozzetto S, et al. Relationship between quality of life and behavioural disorders in children with persistent asthma: a Multiple Indicators Multiple Causes (MIMIC) model. Sci Rep. [Internet]. 2020 [cited 2022 Jan15];10:1-9. Avaiable from: https://doi:10.1038/s41598-020-62264-9.
[14]. Netz M, Fedele DA, Sweenie R, Baker D, Light M, McQuaid EL. Asthma Management Responsibility, Control, and Quality of Life Among Emerging Adolescents. J Pediatr Psychol. 2020;45(1):40-49.
[15]. Tan L, Zhang Q, Wu CQ, Wang J, Li M, Ye DM, et al. Influencing factors and evaluation indicators for asthma control level in children. Chin J Contemp Pediatr. 2016;18(9):812-816.
[16]. Wander A, Bhargava S, Pooni PA, Kakkar S, Arora K. Quality of life in children with bronchial asthma. Pediatric rev: int j pediatrics res. 2017;4:382-387.
[17]. Ahmed PA, Ulonnam CC, Mohammed-Nafi'u R. Assessment of quality of life among children with bronchial asthma and their caregivers at the National Hospital Abuja, Nigeria. Niger J Paediatr. 2016;43(2):88-94.
[18]. Matsunaga NY, Oliveira MS, Morcillo AM, Ribeiro JD, Ribeiro MA, Toro AA. (2017). Physical activity and asthma control level in children and adolescents. Respirol. 2017;22(8):1643–1648.
[19]. Chipps BE, Haselkorn T, Rosén K, Mink DR, Trzaskoma BL, Luskin AT. Asthma Exacerbations and Triggers in Children in TENOR: Impact on Quality of Life. J Allergy Clin Immunol Pract. 2018;6(1):169-176.
[20]. Jović D, Petrović-Tepić S, Knežević D. Assessment of the quality of life in children and adolescents with asthma. Slovenian Nursing Review, 2018;52(2):81–89.
[21]. Barbosa RR, Monteiro KS, Maciel ÁC, Da Silva FE, Jales LM, Santino TA, et al. Relationship between anxiety symptoms, clinical control and quality of life of children with asthma: A cross-sectional study. Pediatr Pulmonol. 2021;56(7):1906-1914.