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Screening for emotional and psychosocial disorders in children with asthma

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Abstract
Background: *Asthma has an estimated prevalence of 20% of children and adolescents, being the most common chronic disease of childhood. Its consequences compromise the quality of life, are associated with an increase in psychiatric disorders, the number of hospitalizations, and school absenteeism, thus being considered an important public health problem.*
Objectives: *perform screening for emotional and psychosocial disorders in children and adolescents with asthma by applying the Pediatric Symptoms Checklist.*
Method: *it was an epidemiological cross-sectional study of children and adolescents with asthma assisted at the Specialized Child Care Center and the General Pediatric Outpatient Clinic of a University Hospital, both in Cascavel City, Paraná, Brazil. The variables analyzed were: gender, age, in addition to the application of the Health Quality Questionnaires and the List of Pediatric Symptoms. For description of qualitatives variables, frequencies and percentages were considered, and for data analysis, the Fisher's Exact Test was used for proportions; p values < 0.05 indicated statistical significance.*
Results: *105 questionnaires were applied, of these, five were excluded for incomplete completion, 100 questionnaires were selected, age ranged from 6 to 16 years, and 87 (87%) were under 12 years, of these, 51 (51%) were girls. Regarding health quality, 16 (16%) reported having bad quality and 67 (67%) good quality. The Pediatric Symptoms Checklist was positive in 12 (12%) of the participants.*
Conclusion: *Asthmatic children under age of 12 were more prone to develop psychoemotional disorders by the Pediatric Symptoms Checklist.*
Keywords: *Child. Adolescent. Asthma. Mental Disorders. Surveys and Questionnaires.*

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I. Introduction

Asthma is a chronic inflammatory disease whose pathophysiology involves mechanisms of hyper-responsiveness of the lower airways and is manifested by episodes of dyspnea, cough, sensation of chest oppression, and, more characteristically, wheezing [1,2]. It can there be symptoms of varying severity, from mild to fatal, and are associated with multiple triggers such as exposure to allergens, pollutants, weather conditions, exercise, or airway infections [1-4]. It is the most common chronic disease of childhood [5].

In children and adolescents, the existence of chronic illnesses such as asthma can be a potential risk factor for mental health. It is an important cause of school absenteeism and a contradiction to the freedom that adolescents crave [6,7]. In this context, mental disorders can be considered a connection between asthma and childhood morbidity [8-10].

The early recognition of psycho-emotional symptoms that suggest mental disorders in children and adolescents with asthma should be done through monitoring with a multidisciplinary team and can be facilitated through the use of validated instruments for screening emotional problems [11]. Several instruments have been validated to screening for psychoemotional problems, such as the Pediatric Symptoms Checklist (PSC), the

Child Behavior Checklist (CBCL), and the Children's Depression Inventory 2 (CDI 2); and other specific instruments such as the Asthma Control Questionnaire (ACQ) and the Asthma Control Test (ACT) [11].
The purpose of this research was to apply the Pediatric Symptoms Checklist questionnaire in children and adolescents with asthma to screening for emotional and psychosocial problems, in addition to applying a health quality questionnaire.

II. Method

This is an epidemiological, observational, cross-sectional study of children and adolescents of both genders, aged 6 to 16 years, diagnosed by a physician as having asthma employing a clinical examination and/or spirometry. For this study, the participants were classified as having asthma according to the Global Initiative for Asthma, 2021 (GINA, 2021), which uses the criteria of the presence of daytime symptoms, nocturnal awakenings due to asthma, need for rescue medication, limitation of activities due to asthma, and classifies the asthma control as controlled, partially controlled, or uncontrolled [2]. All subjects were followed at the Specialized Child Care Center *(CEACRI)* or the General Pediatric Outpatient Clinic of a University Hospital, both in Cascavel City, Paraná, Brazil.

After signing the Informed Consent Form (ICF) by those responsible and the Informed Assent Form (IAF) by the participant aged 7 years or older, two questionnaires were completed by those responsible: the Pediatric Symptoms Checklist (PSC), Brazilian-Portuguese version, and a healthy quality questionnaire.

Data collection was carried out between April and October 2021. Those responsible for the patients were invited to participate voluntarily, being previously explained the objectives of the study and have their doubts about the work answered.

The PSC is a screening instrument for identifying children and adolescents with emotional and/or psychosocial problems. The score indicates the frequency in which the situation occurs, with zero for "never", one for "sometimes", and two for "frequently". The instrument has 35 items, easily understood by the reader. The cut off point established for this study was 28 or more points when the result was considered positive, a situation in which the child or adolescent would be indicated for evaluation by a mental health professional. The PSC is not used to identify a specific disorder, but rather to screening of attention symptoms, internalizing problems (somatic complaints, anxiety, withdrawn, and depression), and externalizing problems (hyperactivity, aggressive and impulsive behavior). In this study, the researchers chose to apply the PCS because it is the instrument used in the work of this research group.

Additionally, a questionnaire on health quality was applied to the guardian, which was prepared by the researchers themselves. The questionnaire consists of a question about how the guardian evaluates the overall health quality of the child or adolescent and has two possible pre-established answers, which are: bad or good.

In addition to the two questionnaires, the following variables were analyzed: gender and age.

The exclusion criteria for the study were: children and adolescents outside the proposed age range, patients not accompanied by a legal guardian, guardians who did not authorize participation in the study, and subjects who did not wish to participate in the research.

The computer software Stata/SE v.14.1, Stata Corp LP, USA, 2021 was used for statistical analysis. Descriptive measures such as absolute (n) and relative (%) frequencies were made for categorical variables. Fischer's Exact Test was used for proportions, and p-value <0.05 was considered significant.

This research was approved by the Research Ethics Committee of the Western Paraná State University, in Cascavel City, PR, Brazil, under opinion number 4.637.484/2021.

III. Result

105 questionnaires were distributed, of which five were excluded for incomplete completion. One hundred children between 6 and 16 years old participated (general average: 8.86 years; female: 8.87 years and male: 8.84 years), of which 87 (87%) were younger than 12 years old. Of these, 51 (51%) were girls and 49 (49%) were boys. Regarding health quality, 17 (17%) did not answer the question, 16 (16%) reported poor quality, and 67 (67%) good quality. The majority with positive score (≥ 28) in the Pediatric Symptoms Checklist were younger than 12 years old, corresponding to a total of 11 (91.6%) individuals. The Pediatric Symptoms Checklist was positive in 12 (12.6%) of the participants, seven (58.3%) male and five (41.6%) female. Tables 1 and 2 present the results obtained in the study correlating scores on the PSC and age, health quality, asthma control, and gender, as well as the p-value.

Table 1: Correlation between PSC score and age in pediatric asthma

	Age (years)				p value
	≤ 12		> 12		
PSC classification*	n	%	n	%	
PSC negative	76	87.4%	12	92.3%	1.000
PSC positive	11	12.6%	1	7.7%	
Total	87	100.0%	13	100.0%	

*PSC (Pediatric Symptoms Checklist)

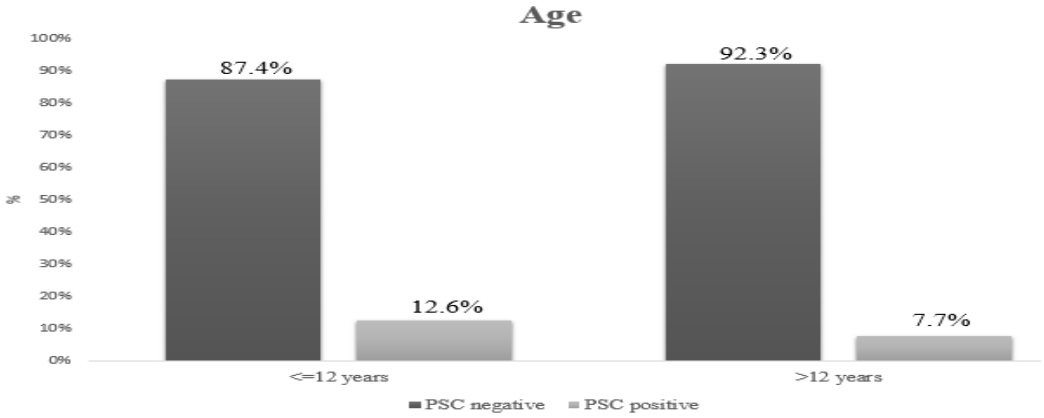
Table2: Correlation between PSC scores and health quality, asthma control, and gender.

	Quality of Health				p value
	Poor		Good		
PSC classification*	n	%	n	%	
PSC negative	12	75.0%	60	89.6%	
PSC positive	4	25.0%	7	10.4%	0.210
Total	16	100.0%	67	100.0%	
	Asthma Control				
	Controlled		Partly controlled or Uncontrolled		
PSC classification*	n	%	n	%	
PSC negative	72	88.9%	16	84.2%	
PSC positive	9	11.1%	3	15.8%	0.694
Total	81	100.0%	19	100.0%	
	Gender				
	Male		Female		
PSC classification*	n	%	n	%	
PSC negative	42	85.7%	46	90.2%	0.550
PSC positive	7	14.3%	5	9.8%	
Total	49	100.0%	51	100.0%	

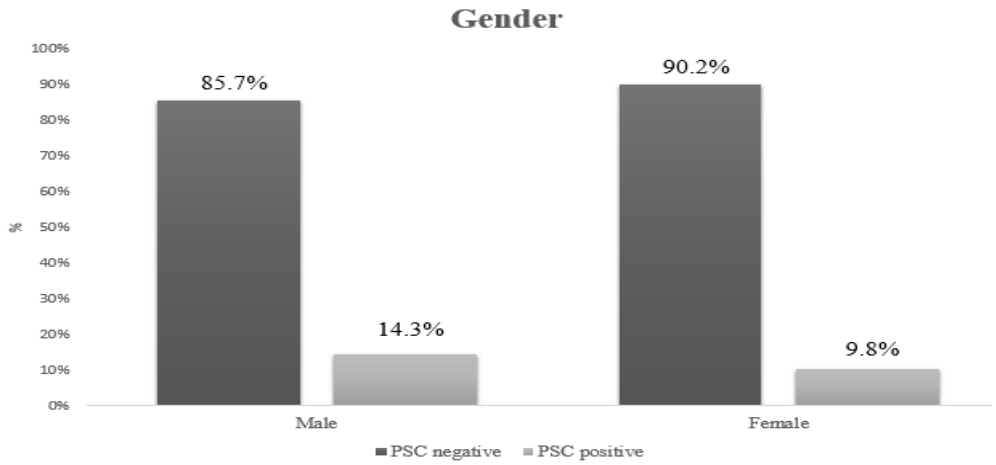
*PSC (Pediatric Symptoms Checklist)

Graphic 1, 2, 3, and 4 show the percentages on the PSC score and their relationship to age, gender, health quality, and asthma control.

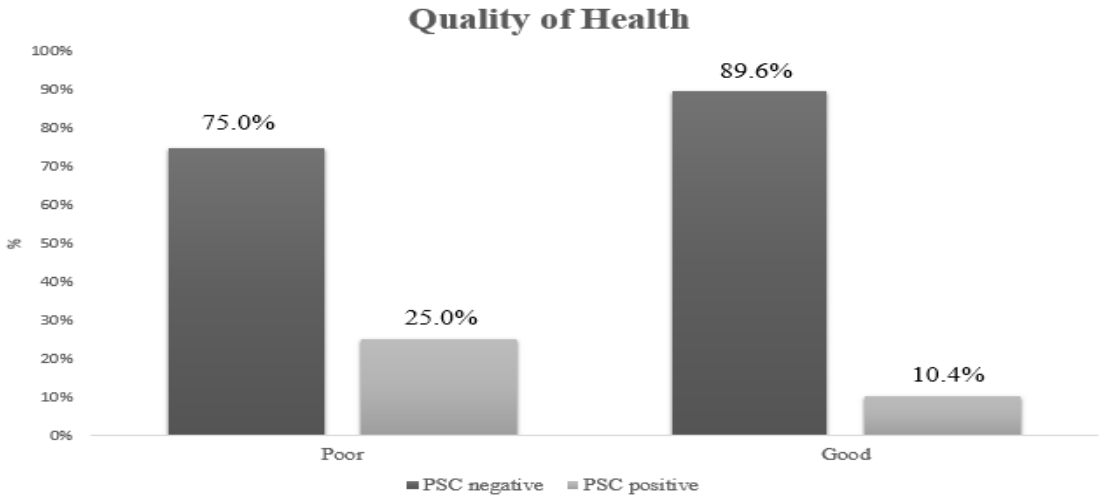
Graphic 1: Relationship between age and PSC score



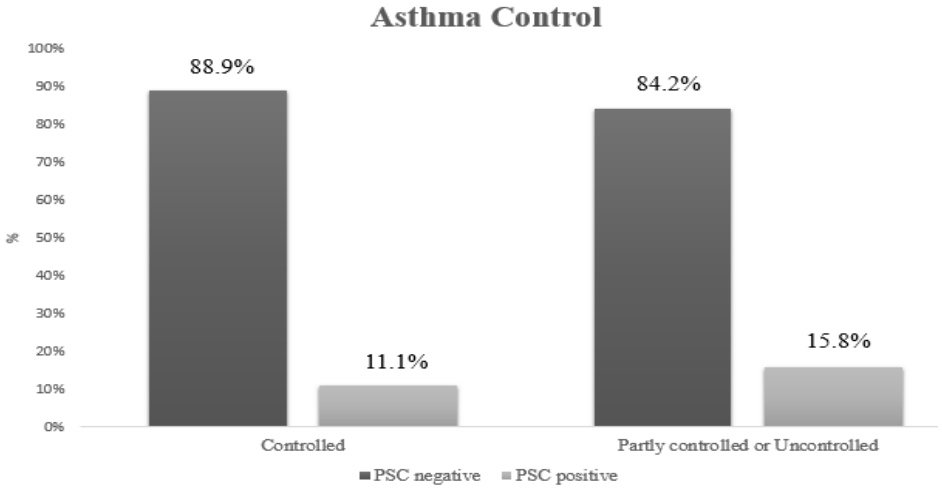
Graphic 2: Relationship between gender and PSC score



Graphic 3: Relationship between quality of health and PSC score



Graphic 4: Relationship between asthma control and PSC score



IV. Discussion

Asthma is the most prevalent chronic disease in childhood, of inflammatory etiology, whose pathophysiology involves hyper-reactivity of the airways, mediated by immunoglobulin E, resulting in airflow obstruction, alteration in ventilation/perfusion, leading to a state of hypoxemia that compromises the quality of life of the patient, and is considered an important public health problem. In Brazil, the prevalence of asthma is estimated to be 19 to 24.3% in children and adolescents [7]. The damages resulting from asthma are countless, from problems of physical nature to public health problems, such as increase in the number of hospitalizations, social problems such as school and work absenteeism, as well as associated psychiatric comorbidities, mainly Attention-Deficit;Hyperactivity Disorder (ADHD), anxiety, and depression [10,12, 13].

In this study, the percentage of children with positive PSC scores was similar to that found in the literature, both in Brazil and in international studies [11, 14].

It is noted in the literature that uncontrolled asthma is related to the development of psychoemotional disorders and poorer quality of life [10, 15], and these results are similar to this research. Although PSC's positivity does not necessarily mean psychiatric disorder, it does indicate those who would benefit from further investigation by mental health professionals [11].

As in some studies, this research showed that compromised mental health in children with asthma may be related to worse quality of health, moreover, the more controlled asthma, the better the quality of life, and the reverse is also true [17-20].

Uncontrolled asthma interferes with mental health, as demonstrated in this study. Children and adolescents with uncontrolled asthma are more likely to developmental disorders such as depression and anxiety, part of these results are explained by the limitations imposed by a chronic disease that can interfere with their body image, self-esteem, and self-confidence, which increases the risk of emotional disorders. [10, 20].

In this paper, asthmatic boys had higher scores for developing mental disorders. One study evaluated a population of 21,065 children and adolescents and showed scores for positive responses more significantly in the male gender [7]. Another study showed twice the prevalence of attention-deficit-hyperactivity disorder (ADHD) in boys than in girls [9]. Two other studies in asthmatic children identified a significantly higher association of boys over girls in scores on the PSC [15, 16]. It is evident in the literature that children with asthma are more likely to develop psychiatric disorders, such as ADHD, anxiety, and depression, as well as higher rates of disability [10, 15-18].

An early and continued evaluation of the mental health of these children and adolescents is necessary, and it is up to the physician and the multidisciplinary team the ability to question and identify risk factors for mental disorders. It is known that it is common for these disorders to emerge during the course of the illness. Children and adolescents with psychoemotional disorders have worse disease control and higher rates of hospitalization. This finding reinforces the need for adequate screening methods and early multidisciplinary follow-up, since these complications may present potential life-threatening and increased health care costs, and are avoidable and preventable with adequate follow-up and early diagnosis. The treatment of psychiatric comorbidities favors the individual globally, contributing to a better quality of life and control of the underlying disease, reducing complications, and improving prognosis. The multidisciplinary support offered to the family and the patient can mitigate the damage caused by the disease and favor a healthy development, valuing well-being and quality of life [8, 10, 15].

This research presented some limitations: the fact that the questionnaire was answered only by the parents limits the perception to only one of the parties, restricting the information collected, in addition, the low number of participants impaired the statistical analysis.

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