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Relationship between quality of life and asthma diagnosis in adolescents: a review study

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Resumo

To describe, through a Systematic Literature Review, the relationship between quality of life and the diagnosis of asthma in adolescents. Method: Article searches were conducted in November 2023 in the electronic databases PubMed, Scielo, and the Capes Journals system using the descriptors Asthma, Quality of Life, and Adolescents. The inclusion criteria were articles published in the last 6 years (2018-2023), without language restrictions, and that addressed the topic. Results: A total of 23 potentially relevant studies were identified. Fifteen articles were excluded for not presenting a primary outcome related to the objective of this review. Thus, eight articles were included for final analysis according to the inclusion criteria. Conclusion: Some variables related to asthma in adolescents are uncontrollable, such as severity. However, others can be managed, such as body weight, sleep, among others. Therefore, it is emphasized that the support of friends and family during the process of coping with asthma is crucial for adolescents, as it encourages them to adopt healthy habits, deal positively with the disease, and significantly improve their clinical condition.

1. Introduction

Asthma is a heterogeneous disease characterized by a history of respiratory symptoms such as wheezing, shortness of breath, chest tightness, and cough, which can vary over time and in intensity, and are associated with a variable limitation of expiratory airflow. The airflow limitation may be persistent and is generally correlated

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with hyperresponsiveness and inflammation of the lower airways, though these are not necessarily required for diagnosis [1]. Approximately 235 million of the world's population is affected by asthma, where it is considered one of the most common chronic diseases worldwide [2].

An average of 200,000 annual hospitalizations in Brazil are due to asthma, making it the fourth leading cause of hospitalizations in the Unified Health System. This is justified by the fact that, in 2009 alone, these hospitalizations incurred costs of R$103 million. About 5% to 10% of the global population has asthma; however, one-third are under 18 years of age, and in half of the cases, symptoms begin before the age of five, decreasing to 25% only after the age of 40 [3].

The transition period between childhood and adulthood is called adolescence, and it is characterized by significant physical, mental, emotional, sexual, and social development[4]. According to the World Health Organization (WHO), adolescence is defined as the period between 10 and 19 years of age, beginning with the bodily changes of puberty and ending when the adolescent solidifies their growth and personality [4].

Asthma symptoms can be intensified by various factors depending on the age group. In adolescents, these acute exacerbations can be triggered not only by inhalable allergens such as dust mites, fungi, pet hair, saliva, and urine, but also by sudden temperature changes and the inhalation of nonspecific irritants like strong odors and cigarette smoke, leading to symptoms through non-immunological mechanisms [4].

During childhood, asthma affects boys twice as often as girls. However, this changes radically during puberty, where the prevalence is much higher in females during adolescence, with a greater remission rate in boys and a higher number of new cases in girls [4]. Quality of life (QL) is widely used in the health field, and the WHO defines it as the perceptions that a person has about their position in life and in the

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context of their culture, including the value systems they live by, their goals, standards, concerns, and perspectives [5].

Due to its chronic nature, asthma has economic repercussions, also causing physical and social restrictions that can negatively impact the quality of life (QL) of these asthmatic adolescents[6]. Fontan (2020) highlights the importance of including health-related quality of life (QL) in the assessment and understanding of the health status of asthmatic patients, considering that the limitations imposed by the disease can often result in a decline in the QoL of those affected [6].

An individual's perception of their life after the illness, as well as how they cope with the possible side effects of treatments, or how they perceive the implications of the illness in their daily life, are factors related to the concept of Health-Related Quality of Life (HRQL) [6]. This concept can be understood as the subjective dimension of health, encompassing not only physical aspects but also psychological, social, and functional aspects of individuals' well-being in the face of an illness [1].

The quality of life of individuals with asthma becomes impaired due to respiratory crises and complications. To address this, a tool was created to specifically assess this variable in individuals with asthma: the Asthma Quality of Life Questionnaire (AQLQ). The AQLQ includes symptoms classically associated with asthma, responses to environmental triggers, the need to avoid these triggers, activity limitations, and emotional dysfunction, which are important areas of quality of life impairment for asthma patients [7].

Given the above, it becomes evident that investigating the relationship between an asthma diagnosis in adolescents and the impact of the disease on their quality of life is necessary to elucidate the extra-clinical dimensions imposed by the illness. Thus, the guiding question of this research was: "What is the relationship between quality of life and an asthma diagnosis in adolescents?".

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2. Method

This is a Systematic Literature Review aimed at synthesizing previously published articles on the proposed topic.

2.1 Protocolo e registro

This systematic review was conducted in accordance with the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The review protocol will be registered with the International Prospective Register of Systematic Reviews (PROSPERO).

The guiding question of the study was: "What is the relationship between quality of life and an asthma diagnosis in adolescents?" To address this question and to compile the research corpus, article searches were conducted in November 2023 across the electronic databases PubMed, Scielo, and the CAPES Periodicals system using the following descriptors in Portuguese: asma, qualidade de vida, adolescentes, and in English: asthma, quality of life, and adolescent. These descriptors were combined using the logical operator AND. The selection of descriptors used in the review was based on consultations with MeSH (Medical Subject Headings) and DeCS (Health Sciences Descriptors).

The inclusion criteria were articles published in the last 6 years, from 2018 to 2023, with no language restrictions, that address the relationship between quality of life and an asthma diagnosis in adolescents. Review studies, dissertations, theses, duplicated articles, conference papers, and research that did not link quality of life with an asthma diagnosis in adolescents were excluded.

All search, selection, and evaluation processes of the articles were carried out by two researchers. The publications that met the inclusion criteria were original articles and controlled studies, analyzed comprehensively and independently, and then compared to verify concordance between the researchers, following the steps outlined by the Cochrane method. Additionally, the articles were evaluated for relevance using

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the PEDro Scale by Claudia Costa and Jan Cabri and classified as poor (<4), fair (4-5), good (6-8), and excellent (9-10).

The review was conducted in three stages. In the first stage, articles were included or excluded based on their titles. In the second stage, after reading the abstracts. In the third stage, the full text was accessed and evaluated for relevance.

3. Results

The following steps were taken for the search and selection process of articles included in this review: Initially, 23 potentially relevant studies were identified, and after reading them, 15 were discarded for not presenting a primary outcome related to the objective of this review. Thus, 8 articles were included for final analysis according to the pre-established inclusion criteria (TABLE 1).

Of these, 2 articles are in Portuguese and 6 in English, published between 2018 and 2023 in the databases Scielo, PubMed, and Capes Periodicals.

Figure 1: Source own elaboration based on PRISMA

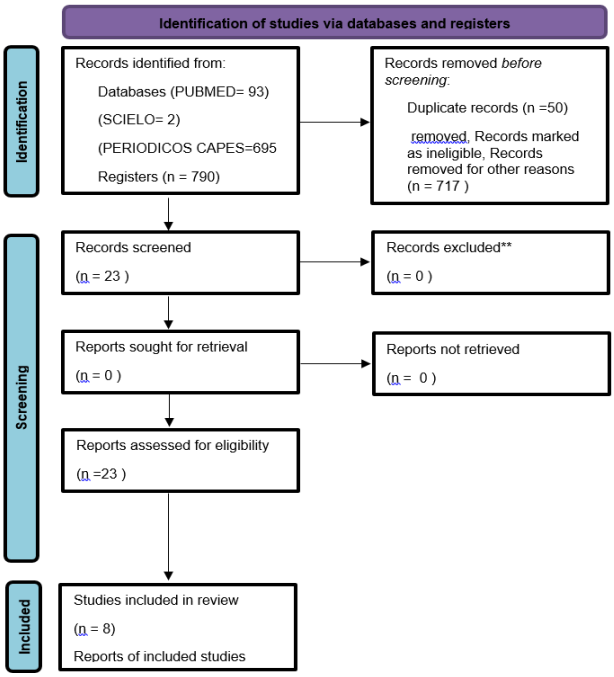

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Table 1 - Presentation of the characteristics of the articles included in the Systematic Review. Brazil, 2022

Autores	Ano	Objetivo	N° de Participantes (m/f)	Conclusões	Local do Estudo	Pontuação escala de pedro
Sleath B.[8]	2019	This study examined whether young people who received a list of questions about asthma/video intervention were more likely to have their asthma controlled and a better quality of life at 12 months compared to those who received usual care.	359 **M=** 205 (57,10%) **F=** 154 (42,9%)	Asthma control and quality of life did not improve significantly more in the intervention group than in the usual care group.	North Carolina, USA	10 points (Excellent)
Fontan[6]	2020	Evaluate the quality of life and its association with disease control, severity, allergic comorbidities, and treatment adherence in children and adolescents with asthma.	104 **M=** 63 (62,4%) **F=** 41 (37,6%)	Children and adolescents with asthma experience a reduced quality of life, which is associated with poorer disease control and greater severity, as well as the presence of allergic comorbidities.	Santa Catarina, Brazil	6 points (good)
Íris Santos Silva[11]	2022	Evaluate the perception of quality of life (QoL) in asthmatic adolescents followed up in a pediatric allergy clinic at a level II hospital.	41 **M=** 28 (68,3%) **F=** 13 (31,7%)	QoL is directly related to the level of control and severity of asthma. The use of a Portuguese questionnaire, which allows for the assessment of QoL, can be a useful tool both in encouraging adolescents to adhere to therapy and in guiding the healthcare professional in their work.	Guarda, Portugal.	5 points (reasonable)
Lisa J Meltzer[12]	2019	Examine the impact of sleep opportunity on asthma in adolescents.	54 **M=** 17 (31,48%) **F=** 37 (68,52%)	Insufficient sleep opportunity negatively impacts both the daily objective and subjective symptoms of asthma in adolescents, as well as health-related quality of life. Given that a majority of adolescents suffer significantly from sleep deprivation, it is important to focus on sleep health in asthma treatment.	Denver, Colorado.	7 points (good)
Mota[13]	2018	Assessing health-related quality of life (HRQOL) among adolescents diagnosed with various chronic conditions and identifying demographic, socioeconomic, and health status outcomes associated with impaired HRQOL.	276 **M=** 140 (50,7%) **F=** 136 (49,3%)	The probability of cancer affecting HRQOL was higher compared to other chronic diseases, and the OW group had worse overall scores compared to CA. Adolescents with CA, AS, and OW reported worse school dimensions compared to healthy adolescents. The education level of adolescents and their parents, body weight, and family income influence HRQOL dimensions in adolescents with chronic diseases. OW = overweight; CA = cancer; AS = asthma; DM1 = Diabetes Mellitus	Goiás, Brazil.	8 points (good)

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Sangngam[10]	2023	Examine the causal relationships between asthma self-management behaviors, asthma symptom control, health-related quality of life, and influencing factors among Thai adolescents.	240 **M=** 165 (68,75%) **F=** 75 (31,25%)	The results confirmed causal relationships between asthma symptom control, self-management behaviors, depression, and health-related quality of life. Health literacy, family and peer support, and relationships with healthcare providers also influenced asthma self-management behaviors.	Bangkok, Thailand.	6 points (good)
Valero-Moreno[5]	2023	The study aims to analyze which variables related to asthma, psychological factors, and family dynamics affect the quality of life of adolescents with asthma.	150 **M=** 91 (60,7 %) **F=** 59 (39,3%)	The adolescent's quality of life is affected by variables related to their asthma that are beyond their control, as well as by other psychological and family-related variables that can enhance their perception of quality of life.	Valencia, Spain.	4 points (reasonable)
Valero-Moreno[9]	2023	Analyzing the relationship between family styles and quality of life (QoL) in adolescents with bronchial asthma, and studying the influence of self-esteem as a protective factor and perception of threat as a risk factor.	150 **M=** 91 (60,7%) **F=** 59 (39,3%)	Self-esteem and family support are protective factors for the well-being of adolescents with bronchial asthma. However, high perceived threat of the disease can have negative consequences for the adolescent's health and adversely impact their quality of life.	Valencia, Spain.	4 points (reasonable)

4. Discussion

It was observed that the articles included in this review addressed the relationship between quality of life and an asthma diagnosis in adolescents, investigating how the diagnosis of asthma impacts and influences the daily life of these adolescents.

It was found that the diagnosis affects not only the adolescents themselves but also those who live with them. The family environment and the behaviors practiced can impact, either positively or negatively, how the adolescent will cope with the challenges posed by asthma over the years.

According to Valero-Moreno, Health-Related Quality of Life (HRQL) is the perception of an individual's or a group's physical and mental health over the years [5]. According to the WHO (2020), the chronic respiratory disease that most affects children and adolescents today is asthma [5].

In a study conducted by Sleath, adolescents were divided into an intervention group (185) and a usual care group (174). It was observed that 60% of the adolescents

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in the usual care group had well-controlled asthma, compared to those in the intervention group8. This can be related to Valero-Moreno's study, which found that family characteristics such as promoting autonomy, communication, and affection contributed to greater well-being in adolescents. Conversely, factors like psychological control and behavioral control negatively affected their lives [9].

Additionally, Sangngam found that adolescents with support from family and friends exhibited appropriate asthma self-management behaviors. This suggests that asthma imposes a treatment burden on those who live with the adolescent as well [10].

Moreover, Sangngam states that loneliness was reduced in adolescents with asthma when they perceived support from friends. As a result, this support encouraged them to maintain asthma self-management behaviors, feel comfortable self-medicating in public, and openly express their symptoms. This underscores the significant influence of social support on asthma control in adolescents.

In another study by Valero-Moreno, which assessed family styles and quality of life in adolescents with asthma, focusing on self-esteem and perceived threat of the disease, it was observed that high quality of life in patients was associated with healthy family styles. High self-esteem scores played a protective role, reducing the emotional impact on the adolescents [9].

This study revealed a low score of perceived threat from the disease, which the author attributed to a lack of understanding or appreciation of asthma. Specifically, when asked about the main causes related to asthma, 63% of the adolescents did not know what caused their condition [9].

Regarding the sex of adolescents with asthma, Valero-Moreno observed that girls had lower scores in quality of life, particularly in areas such as feelings of fatigue, disease control, and emotional well-being. This finding is consistent with Fontan's report, which found a relationship between the severity of asthma and the adolescent's emotional functioning [6].

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Fontan's study showed that, in relation to asthma severity, adolescents with moderate to severe asthma had 63.3% moderate to severe impairment in quality of life, compared to adolescents with mild asthma, where 68.2% experienced none or minimal impairment. On the other hand, regarding asthma control associated with emotional function, 69.8% of adolescents with well-controlled asthma had none or minimal impairment in quality of life, whereas 75.9% of those with partially controlled or uncontrolled asthma experienced moderate to severe impairment in quality of life [6].

This corroborates the findings of Silva, where adolescents with well-controlled asthma scored higher in all domains and in the total score of the PAQLQ (Pediatric Asthma Quality of Life Questionnaire) compared to those with uncontrolled asthma. This resulted in a statistically significant difference in scores across all groups of the questionnaire [11].

Silva also found that the presence of anxiety revealed a statistically significant difference ($p<0.05$) in the quality of life of adolescents with asthma, particularly in the domains of symptoms and emotional well-being. This was justified by the fact that anxiety acts as a trigger for asthma episodes, maintaining a significant relationship with the symptoms domain [11].

However, it is known that anxiety can be a consequence of uncontrolled asthma rather than a cause of the disease. As a result, anxiety may contribute to a worsening quality of life [11]. This implies the need for a more detailed investigation of each adolescent's history to design the best strategies for maintaining an optimal quality of life.

Results from Valero-Moreno's study found that adolescents who required more frequent emergency care and hospitalization had a lower quality of life. Thus, the number of hospitalizations is negatively associated with the quality of life of these adolescents [5].

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This low quality of life and inadequate asthma control corroborates the findings of Fontan, who observed that adolescents treated at the Municipal Polyclinic of Palhoça exhibited moderate to severe impairment in quality of life [6].

In contrast, the study by Sangngam shows that 93.8% of adolescents did not visit the emergency room for asthma exacerbation in the past 12 months, while only 6.2% of adolescents made such visits10. Some of these data suggest that asthma control by adolescents is not consistently managed, particularly with regard to seeking regular follow-up for the disease. This can lead to issues with self-management and overall asthma control.

In a study conducted by Meltzer on asthmatic adolescents, which aimed to manipulate sleep through 5 nights of "short" sleep opportunity and 5 nights of "long" sleep opportunity, the adolescents reported that during the short sleep week, asthma had a greater impact on their daily life12. This suggests that adolescents who have longer nights of sleep may experience an improvement in symptom control.

Thus, the author concluded that insufficient sleep is a factor that negatively impacts both the subjective and objective daily symptoms of asthma, as well as health-related quality of life (HRQL). Meltzer also reaffirms that insufficient sleep in adolescents can lead to issues such as increased daytime sleepiness, poor school performance, inattention, mood problems, depression, risky behaviors, and is a risk factor for hypertension and obesity. This underscores the importance of adequate and prolonged sleep for adolescents [12].

Regarding factors influencing the quality of life of asthmatic adolescents, a study on chronic diseases, including asthma, by Mota showed that the HRQL (Health-Related Quality of Life) score was positively influenced by the variable of engaging in physical activity (8.23 ± 2.25, $p < 0.001$). Additionally, the variables of income (0.02 ± 0.003, $p < 0.001$), engaging in physical activity (11.09 ± 2.77, $p < 0.001$), and being in school (13.91 ± 4.06, $p < 0.001$) had positive effects on physical health. Moreover, compared

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to healthy adolescents, the group of adolescents with asthma reported poorer school dimensions [13].

On the other hand, HRQL was negatively influenced by the following variables: having a higher body weight (-0.20 ± 0.07, $p < 0.01$), having widowed parents (-12.27 ± 4.01, $p < 0.01$), being from another state (-8.97 ± 2.89, $p < 0.01$), and having a negative effect from BMI (-0.81 ± 0.26, $p < 0.01$), as well as having widowed parents (-16.53 ± 5.05, $p < 0.01$), and the number of people living in the same household as the adolescent (-5.02 ± 1.53, $p < 0.01$) [13].

Fontan's study found that 79.7% of patients with activity limitations had moderate to severe asthma, and 82.8% of patients with activity limitations had asthma that was partially or not controlled, both of which consequently resulted in moderate to severe impairment in quality of life. Additionally, in Silva's study, the domain of activity limitation showed the least statistical difference between groups, which was attributed to the fact that parents often do not encourage their children to engage in physical exercise due to fear of exercise-induced asthma [11].

In a study conducted with Thai adolescents with asthma in Bangkok, Thailand, it was reported that depression also indirectly affects quality of life through the management of asthma symptoms. Symptoms such as moodiness and aversion can interfere with and exacerbate the situation for asthmatic adolescents, as they can negatively impact the adolescent's cognitive abilities, personality, and overall well-being [10].

Therefore, the study concluded that adolescents with depressive symptoms, compared to those without depression, are more adversely affected in terms of performing daily activities, work motivation, nighttime sleep, social life, and relationships. This leads to a poorer health-related quality of life [10]. Moreover, the ability to interpret information about the disease, family support, peer support, and a

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good relationship with healthcare providers had direct and significant effects on asthma self-management behaviors [10].

Regarding factors associated with asthma, Fontan's study with 104 patients showed that 23.8% of adolescents were exposed to smoking in their homes, 67.3% had some type of pet in the house, and 79.2% lived in urban areas [6].

In terms of clinical profile, 58.4% of adolescents were classified as having a normal weight and 34.7% were considered obese. Regarding family history, 85.1% reported that someone in the family had asthma, with 53.5% indicating that it was a parent and/or siblings. Concerning allergic comorbidities, 98.2% had such conditions, with 94.1% mentioning allergic rhinitis6. In Silva's study, it was also shown that 82.9% of adolescents had allergic rhinitis, while only 17.1% did not have this condition [11].

An interesting finding in Fontan's study is that adolescents without any allergic comorbidities showed no impairment in quality of life related to activity limitations, symptoms, or emotional function. In contrast, adolescents with allergic comorbidities largely exhibited moderate to severe impairment in quality of life related to these factors. This confirms that having additional comorbidities can significantly impact the quality of life for adolescents [6].

5. Conclusion

After evaluating 8 systematically reviewed articles, we concluded that asthma is a condition that can negatively affect the adolescent, not only the individual but everyone they interact with, whether at home, school, or work, impacting them physically and psychologically. Many of the variables related to asthma in adolescents are beyond their control, such as the severity of the condition; however, many variables can be controlled, such as body weight and sleep, among others. Therefore, the support of friends and family throughout this process is crucial, as it motivates the adolescent to handle and manage asthma more effectively.

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Lacking a support network—family, emotional, and health care support, especially when not receiving follow-up or treatment—can have serious consequences for these adolescents, such as low self-esteem, depression, deficits in disease threat control and management, and poor psychological and behavioral control. This can impact their performance in daily activities and their interactions with others. Therefore, it is extremely important to conduct studies that assess the quality of life in asthmatic adolescents to ensure that better measures are taken.

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