Impacts of sleep disorders on the quality of life of children and adolescents

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Abstract

Sleep is an essential physiological process for the proper physical, cognitive, and emotional development of children and adolescents. Sleep disorders, including insomnia, respiratory disturbances, and circadian rhythm dysregulation, are highly prevalent in this population and are associated with negative impacts on quality of life. To analyze factors associated with sleep disorders in children and adolescents and their effects on development and quality of life. This is an integrative literature review based on articles published between 2013 and 2025 in the SciELO, LILACS, Scopus, and MEDLINE databases, using the descriptors “sleep,” “sleep disorders,” “insomnia,” “sleep apnea,” “child health,” and “adolescent.” Studies published in Portuguese, Spanish, or English were included, totaling ten selected articles, of which four were literature reviews, and four were observational studies. The main factors associated with sleep disorders were excessive use of electronic devices, unhealthy dietary habits, unfavorable school schedules, sociogeographic factors, and secondary conditions, such as ASD. Persistent sleep disorders were associated with cognitive impairment, behavioral changes, emotional compromise, and an increased risk of chronic diseases, such as asthma. Sleep disorders in children and adolescents have a multifactorial etiology and can significantly compromise quality of life and overall development. Preventive strategies and multidisciplinary interventions, combined with public health policies aimed at promoting healthy sleep, are essential to reduce their impact.

Keywords: sleep, sleep disorders, children, adolescents, quality of life.

Impactos dos distúrbios do sono na qualidade de vida de crianças e adolescentes

Resumo

O sono é um processo fisiológico essencial para o adequado desenvolvimento físico, cognitivo e emocional de crianças e adolescentes. Distúrbios do sono, incluindo insônia, alterações respiratórias e desregulação do ritmo circadiano, são altamente prevalentes nessa população e estão associados a impactos negativos na qualidade de vida. Analisar os fatores associados aos distúrbios do sono em crianças e adolescentes e seus efeitos sobre o desenvolvimento e a qualidade de vida. Trata-se de uma revisão integrativa da literatura, realizada a partir de artigos publicados entre 2013 e 2025 nas bases de dados SciELO, LILACS, Scopus e MEDLINE, utilizando os descritores “sono”, “distúrbios do sono”, “insônia”, “apneia do sono”, “saúde da criança” e “adolescente”. Foram incluídos estudos publicados em português, espanhol ou inglês, totalizando dez artigos selecionados, dos quais quatro eram revisões de literatura e quatro estudos observacionais. Os principais fatores associados aos distúrbios do sono foram o uso excessivo de dispositivos eletrônicos, hábitos alimentares inadequados, horários escolares desfavoráveis, fatores sociogeográficos e patologias secundárias, tais como o TEA. Distúrbios do sono persistentes estiveram associados a prejuízos cognitivos, alterações comportamentais, comprometimento emocional e aumento do risco de doenças crônicas, como a asma. Os distúrbios do sono em crianças e adolescentes apresentam etiologia multifatorial e podem comprometer significativamente a qualidade de vida e o

desenvolvimento integral. Estratégias preventivas e intervenções multidisciplinares, aliadas a políticas públicas voltadas à promoção do sono saudável, são fundamentais para reduzir seus impactos.

Palavras-chave: sono, distúrbios do sono, crianças, adolescentes, qualidade de vida.

1. Introduction

Sleep is a central component of a complex and dynamic physiological state characterized by a transient reduction in sensory responsiveness to external stimuli, often accompanied by partial or complete eye closure. It is a biologically active and highly regulated process, essential for maintaining organismal homeostasis. During sleep, fundamental functions occur, including synaptic plasticity and memory consolidation, emotional regulation, bodily repair (Mason et al., 2021), energy metabolism, macromolecule biosynthesis, clearance of metabolic waste and neurotoxic substances, as well as the preservation of cellular structural and functional integrity (Ouyang et al., 2026; Vyazovskiy, 2015).

In the context of child and adolescent development, sleep plays a pivotal role in supporting physical growth, cognitive maturation, and emotional and behavioral regulation. Sleep patterns during this stage of life undergo progressive changes, mainly reflected in a gradual reduction in total sleep duration over 24 hours. Newborns are estimated to require 14 to 17 hours of sleep per day, whereas children aged one to two years require between 11 and 14 hours (Zhang et al, 2022).

This duration decreases to approximately 10 to 13 hours in preschool children, 9 to 11 hours in school-aged children, and 8 to 10 hours in adolescents, as described by Hirshokowitz et al. (2015). These changes are primarily associated with the consolidation of circadian rhythms and the maturation of neurobiological mechanisms responsible for the regulation of sleep–wake cycles. Despite the essential role of sleep in maintaining and promoting physical and mental health, a substantial proportion of the population—particularly children across different age groups still fails to achieve the recommended sleep duration or experiences some form of sleep disorder (Baranwal et al., 2023).

Despite its importance, sleep disorders are highly prevalent in childhood and adolescence and may significantly compromise the physical, cognitive, and emotional well-being of affected individuals. According to the International Classification of Sleep Disorders, third edition (ICSD-3), developed by the American Academy of Sleep Medicine (AASM, 2014), the main categories of sleep disorders include insomnia, sleep-related breathing and movement disorders, central disorders of hypersomnolence, circadian rhythm sleep–wake disorders, and parasomnias. These conditions may occur as primary disorders or secondary to clinical diseases, such as asthma, obesity, neuromuscular diseases, gastroesophageal reflux disease, and epilepsy, as well as being associated with neurodevelopmental disorders—such as attention-deficit/hyperactivity disorder and autism spectrum disorder (ASD) (Albertini et al., 2025)—and psychiatric comorbidities, including anxiety, depression, and exposure to bullying (Nunes; Bruni, 2015).

Considering the importance of sleep for overall development and quality of life in children and adolescents, the present study aimed to examine, through a systematic review of the scientific literature and technical publications published between 2013 and 2025, the effects of sleep disorders, as categorized by the ICSD-3, on the quality of life of individuals aged 18 years or younger.

2. Material and Methods

The present study was conducted as an exploratory bibliographic investigation over 12 months, utilizing an integrative literature review approach. The methodological procedure comprised systematic and well-defined stages, including identification of the theme and delimitation of the object of investigation; establishment of inclusion and exclusion criteria for the selected studies; analysis and interpretation of the results; and, finally, critical reflection on the topic under investigation (Souza et al., 2010; Mendes et al., 2008).

According to Sousa et al. (2017), this methodological approach enables the incorporation of scientific evidence into clinical practice, contributing to the development of more accurate and evidence-based diagnoses. From this perspective, the integrative review, by encompassing studies with different methodological designs—both experimental and non-experimental—promotes a broad, critical, and in-depth understanding of the phenomenon under study.

Initially, an integrative literature review was conducted through systematic searches in the Scientific Electronic Library Online (SciELO), Latin American and Caribbean Health Sciences Literature (LILACS), Scopus

(Elsevier), and Medical Literature Analysis and Retrieval System Online (MEDLINE) databases. The search strategy employed the Health Sciences Descriptors (DeCS): "sleep," "sleep disorders," "insomnia," "sleep apnea," "child health," "child," "adolescent health," and "adolescent". Inclusion criteria comprised full-text articles published in Portuguese, Spanish, or English between 2013 and 2025. Exclusion criteria included duplicate studies across databases, as well as publications that did not directly address the proposed topic, in accordance with the methodological recommendations of Ercole et al. (2014).

After independent screening of titles and abstracts, 37 (thirty-seven) articles were pre-selected for detailed evaluation. Of these, 27 (twenty-seven) were excluded for not meeting the scope criteria or the established time frame (the last twelve years). Thus, the final sample consisted of 10 (ten) articles that directly addressed the topic in the period between 2013 and 2025. The sample included 6 (six) literature reviews and 4 (four) observational studies, whose characteristics are detailed in Table 1.

Table 1. Summary of studies included in the integrative review (2013–2025).

Author(s) / Year	Study Type	Objective	Main Findings	Conclusions
Nunes; Bruni (2015)	Literature review	To describe clinical and diagnostic aspects of insomnia in children and adolescents	Insomnia is highly prevalent in this age group, with etiologies varying according to age and developmental stage	Insomnia has a significant impact on behavior, learning, and emotional regulation
El Halal; Nunes (2018)	Observational study	To assess the frequency and profile of sleep disorders in childhood	High prevalence of sleep disorders associated with cognitive, behavioral, and social changes	A targeted clinical history is often sufficient for diagnostic suspicion
Felden et al. (2018)	Observational study	To investigate the influence of contextual factors on adolescents' sleep patterns	Adolescents from metropolitan areas go to sleep and wake up later than those from rural areas	Urban environment and social habits influence circadian rhythm without changing total sleep duration
Widome et al. (2020)	Observational study	To evaluate the impact of school start times on sleep	Later school start times increased nocturnal sleep duration without impairing sleep efficiency	Adjustments to school schedules may promote better sleep health in adolescents
Khan et al. (2020)	Observational study	To analyze the relationship between diet and sleep disorders in adolescents	High consumption of fast food and sugary beverages doubled or tripled the risk of sleep disorders	There is a direct association between unhealthy dietary habits, anxiety, and poor sleep quality
Bakour et al. (2020)	Longitudinal observational study	To investigate the effects of chronically short sleep duration during adolescence	Insufficient sleep was associated with an increased risk of asthma in young adulthood	Sleep plays a protective role in immune and respiratory health
Rocha et	Systematic	To evaluate the impact	Excessive screen	Screen time

Author(s) / Year	Study Type	Objective	Main Findings	Conclusions
al. (2022)	review	of screen use on sleep in children and adolescents	time causes delayed sleep onset, cognitive impairment, and increased risk of obesity	regulation is essential to promote adequate sleep and behavioral balance
Oliveira et al. (2022)	Literature review	To discuss the main sleep disorders and their impact on quality of life	Disorders such as insomnia and sleep apnea affect multiple physical and emotional domains	Early identification and interdisciplinary management are essential to prevent long-term consequences
El Halal; Nunes (2025)	Narrative review	To analyze sleep disorders in children and adolescents with neurodevelopmental disorders	High prevalence of insomnia, circadian rhythm disorders, sleep-related breathing disorders, and parasomnias, with negative effects on behavior and cognition	Early recognition and targeted clinical assessment are essential to reduce developmental and quality-of-life impairments
Albertini et al. (2025)	Narrative review	To evaluate the prevalence, developmental impact, and intervention strategies for sleep disorders in children with ASD	Sleep disorders are common in ASD and are associated with cognitive, behavioral, and social impairment; behavioral interventions and melatonin are effective	Proper sleep management improves overall functioning and quality of life for children and their families

Source: Authors, 2025.

The methodological process of the study is presented in (Figure 1). Initially, the guiding question was formulated: "What are the factors associated with sleep disorders in children and adolescents, and what are their impacts on development and quality of life?" Subsequently, a search for scientific articles was conducted in the SciELO, LILACS, Scopus, and MEDLINE/PubMed databases, using controlled DeCS descriptors combined with the Boolean operator AND. In total, 37 studies were identified. After applying the previously defined inclusion and exclusion criteria, the final sample consisted of 10 articles, which were qualitatively analyzed.

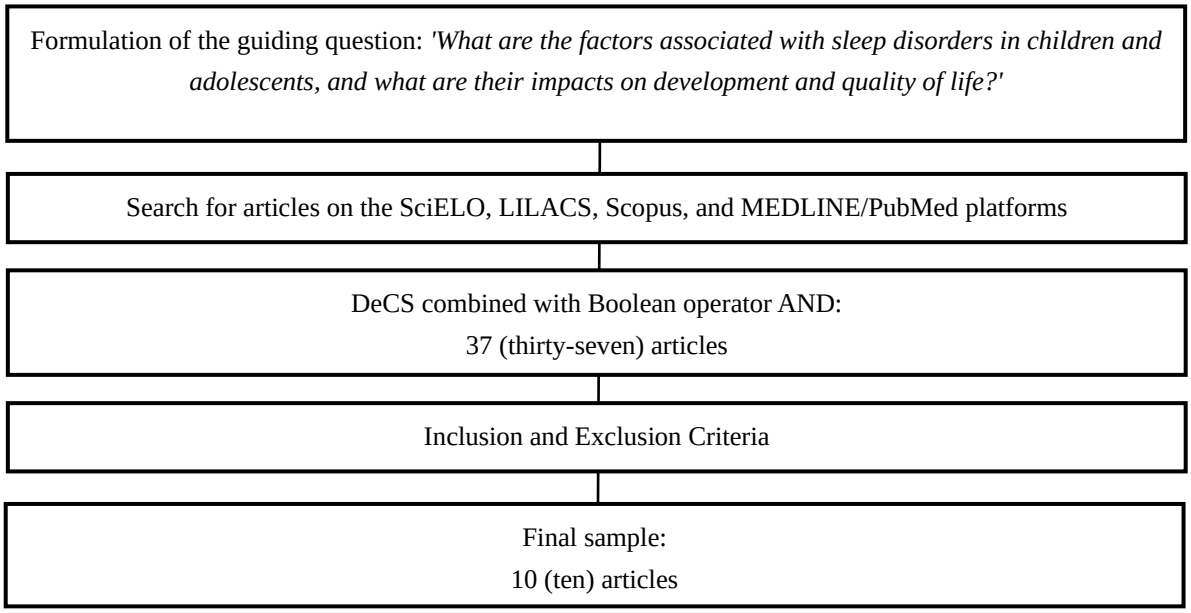

Figure 1. Flowchart of the methodological process. Source: Authors, 2025.

3. Results

The integrative review initially identified 37 (thirty-seven) articles, of which ten fully met the inclusion criteria, forming the final corpus of this study. This sample included 6 (six) literature reviews and 4 (four) observational studies. The synthesis of the studies revealed multiple biological, behavioral, and contextual factors associated with sleep disorders in children and adolescents.

Excessive use of electronic devices emerged as one of the most consistently reported risk factors for impaired sleep and child health. Rocha et al. (2022) demonstrated that prolonged screen exposure is associated with sleep disorders, cognitive deficits, behavioral changes, and an increased risk of obesity. These findings reinforce the harmful role of excessive screen time in sleep regulation and neurodevelopment during childhood and adolescence.

Insomnia was identified as a highly prevalent sleep disorder in the pediatric population. Nunes & Bruni (2015) highlighted that its etiology varies according to age group and biological developmental stage, emphasizing the importance of individualized clinical assessment and management. Similarly, El Halal & Nunes (2018) reported a high frequency of sleep disorders in childhood, with significant behavioral, cognitive, and social repercussions. The authors further emphasized that a detailed and targeted clinical history is often sufficient to raise diagnostic suspicion, reinforcing the importance of careful clinical evaluation.

The prevalence of sleep disorders was even higher among children and adolescents with neurodevelopmental conditions. In the study by El Halal & Nunes (2025), the authors demonstrated that individuals with attention-deficit/hyperactivity disorder and autism spectrum disorder present a higher prevalence of sleep disturbances, including insomnia, circadian rhythm disorders, sleep-related breathing disorders, and parasomnias. Such alterations were strongly associated with impairments in behavior, cognition, and individual learning processes.

Specifically regarding autism spectrum disorder, Albertini et al. (2025) observed a high frequency of sleep-onset and sleep-maintenance insomnia, as well as circadian rhythm dysregulation, indicating marked developmental impairment in affected individuals. Poor sleep quality was directly associated with worse cognitive performance, increased repetitive behaviors, irritability, and difficulties in social interaction, highlighting the negative impact of these disorders on overall functioning and quality of life.

Contextual and environmental factors also exert a significant influence on sleep patterns. Felden et al. (2018) found that adolescents living in metropolitan areas exhibited later bedtimes and wake-up times compared with their rural counterparts, although mean sleep duration did not differ significantly between the groups. Complementing these findings, Widome et al. (2020) demonstrated that later school start times are associated

with increased nocturnal sleep duration, without negatively affecting sleep latency or efficiency, suggesting that institutional adjustments and public policies may promote healthier sleep patterns.

Dietary habits were also identified as relevant determinants of sleep health. Khan et al. (2020) reported that high consumption of fast food and carbonated, sugar-rich beverages increased by two to three times the risk of anxiety-related sleep disorders in adolescents by two to three times, highlighting the interaction between nutritional factors, mental health, and sleep regulation in this population.

Finally, the long-term effects of inadequate sleep were evidenced by Bakour et al. (2020), who demonstrated that persistently short sleep duration during adolescence significantly increases the risk of developing asthma in young adulthood, particularly among individuals with a family history of the disease. These findings reinforce the role of adequate sleep as a protective factor for health across the life course.

4. Discussion

The results indicate that sleep disorders in the pediatric and adolescent population have a multifactorial etiology, involving biological, behavioral, environmental, and social factors. Similar findings were reported by Liu et al. (2024) in their systematic review on the origin of sleep disorders. However, as evidenced by El Halal & Nunes (2025), this complexity becomes even more pronounced in children and adolescents with neurodevelopmental disorders, in whom sleep disturbances not only coexist but frequently exacerbate cognitive, behavioral, and academic impairments. Thus, sleep should be understood as an inseparable component of physical and psychological development, strongly influenced by the contemporary sociocultural context.

One of the most consistent findings across the analyzed studies refers to the association between excessive use of electronic devices and deterioration in sleep quality and duration. Prolonged screen exposure, particularly in the hours preceding bedtime, interferes with melatonin secretion through the action of blue light emitted by electronic devices, disrupting the circadian cycle and leading to difficulties in sleep initiation (Rocha et al., 2022). In populations with neurodevelopmental vulnerabilities, this impact tends to be amplified, as discussed by Albertini et al. (2025), who reported that sleep disturbances are associated with increased irritability, intensification of repetitive behaviors, difficulties in emotional self-regulation, and poorer cognitive performance, especially in children with autism spectrum disorder.

Additionally, according to Khan et al. (2020), unhealthy dietary habits—such as frequent consumption of fast food and sugar-sweetened beverages—are correlated with a higher prevalence of anxiety-induced sleep disorders. This association reinforces the interdependence between eating behavior, emotional regulation, and sleep patterns, since hypercaloric diets rich in simple sugars contribute to glycemic fluctuations and inflammatory processes that affect energy metabolism and emotional stability.

The school and sociogeographic context also proved to be a determining factor for sleep patterns. Studies by Felden et al. (2018) and Widome et al. (2020) indicate that adolescents living in urban areas and exposed to early school start times experience greater sleep deprivation and increased daytime sleepiness. These effects tend to be more pronounced in individuals with neurodevelopmental conditions, in whom, according to El Halal & Nunes (2025), circadian rhythm dysregulation may further aggravate attentional and behavioral difficulties. In this regard, public policies aimed at flexibilizing school schedules represent a potentially effective strategy to restore the balance between biological needs and social demands in this age group, as evidenced by Owens et al. (2014).

Another relevant aspect concerns the long-term consequences of sleep disorders, which extend beyond behavioral outcomes. The study by Bakour et al. (2020) revealed that adolescents with persistently short sleep duration present a higher risk of developing chronic diseases, such as asthma, in adulthood. This association highlights the role of sleep as an immunological and metabolic modulator, corroborating literature that links sleep deprivation to systemic inflammation and endocrine dysfunctions (Bryant et al., 2004; Wittert, 2014).

The joint analysis of the studies also reveals important gaps in the literature. Most investigations are cross-sectional in nature, which limits the ability to establish causal relationships between sleep disorders and their outcomes. Longitudinal studies that comprehensively assess the combined effects of environmental, technological, nutritional, and emotional factors on sleep quality are scarce, particularly in populations with neurodevelopmental disorders, as pointed out by El Halal & Nunes (2025) and Albertini et al. (2025). Moreover, there is a lack of research investigating multidimensional interventions that integrate behavioral, educational, and clinical approaches.

Given this scenario, the importance of interdisciplinary and intersectoral strategies to promote healthy sleep is emphasized. Interventions that include sleep hygiene education, regulation of screen time, nutritional guidance,

school-based adjustments, and individualized clinical follow-up are fundamental. As highlighted by Albertini et al. (2025), appropriate management of sleep disorders can lead to substantial improvements in overall functioning, behavior, and quality of life for both children and their families.

In summary, the findings of this review reinforce that sleep should be recognized as a central determinant of child and adolescent health, with direct impacts on learning, behavior, and quality of life. The systematic incorporation of sleep assessment into clinical practice—especially for children and adolescents with neurodevelopmental disorders—represents an essential step in addressing this growing public health issue.

5. Conclusion

Based on the integrative literature review, it is evident that sleep disorders in children and adolescents are multifactorial phenomena. Excessive use of electronic devices, unhealthy dietary habits, unfavorable school schedules, sociogeographic factors, and secondary medical conditions emerge as significant determinants of sleep quality and duration, potentially compromising cognitive, emotional, and physical development in this population.

Insomnia and other sleep disorders, when not identified and managed early, may result in long-term consequences, including behavioral changes, impaired academic performance, and an increased risk of chronic diseases, such as the higher incidence of asthma observed among individuals who experienced persistently short sleep duration during adolescence.

Accordingly, the findings reinforce the need for multidisciplinary preventive and interventional strategies that integrate sleep hygiene education, regulation of screen use, adjustments to school schedules, nutritional education, and individualized clinical follow-up. Furthermore, relevant gaps in the literature are identified, particularly regarding the scarcity of longitudinal studies that comprehensively assess both determining factors and interventions capable of promoting healthy sleep, highlighting the importance of future research in this field. In summary, the promotion of adequate sleep patterns represents a central component of the holistic development of children and adolescents, positively influencing quality of life, physical health, and emotional well-being.

6. Authors' Contributions

Gabriela Martins: conceptualization, writing - original draft, formal analysis, and research methodology. *Renata Dellalibera-Joviliano*: supervision and writing - review & editing.

7. Conflicts of Interest

No conflicts of interest.

8. Ethics Approval

Not applicable.

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