

THERAPEUTIC APPROACHES TO SLEEP DISORDERS IN CHILDREN WITH AUTISM SPECTRUM DISORDER: AN INTEGRATIVE REVIEW

Renata de Oliveira Machado Amorim

Faculdade de Medicina de Olinda (FMO)

Recife / Pernambuco

<https://orcid.org/0009-0005-9726-4284>

Giulia Hungara Pereira

Centro Universitário do Espírito Santo
(UNESC)

Colatina/ Espírito Santo

<http://lattes.cnpq.br/4628877123047032>

<https://orcid.org/0000-0002-6592-640>

Rebeca da Silva Ribeiro

Faculdade Multivix Vitoria

Vitória - ES

<http://lattes.cnpq.br/5102619937354364>

Mariana Ferron Valadão

Centro Universitário do Espírito Santo
(UNESC)

Colatina/ Espírito Santo

<https://orcid.org/0009-0006-7091-5726>

Carla Lavagnoli Reis

Centro Universitário do Espírito Santo
(UNESC)

Colatina/ Espírito Santo

<https://lattes.cnpq.br/6931479401975324>

All content in this magazine is licensed under a Creative Commons Attribution License. Attribution-Non-Commercial-Non-Derivatives 4.0 International (CC BY-NC-ND 4.0).



José Wilson Cosme de Mesquita Júnior
Universidade da Integração Internacional da
Lusofonia Afro-brasileira (UNILAB)
Redenção/Ceará
<https://lattes.cnpq.br/7635532499097685>
<https://orcid.org/0000-0003-0505-6532>

Lara Diniz Coan
Centro Universitário do Espírito Santo
(UNESC)
Colatina/ ES
<https://orcid.org/0009-0008-2541-4978>

Nathália Sepúlveda Terra Alves
Centro Universitário Redentor
(UniRedentor)
Itaperuna/RJ
<http://lattes.cnpq.br/6323291664909550>

Aline Tenorio da Silva
Centro Universitário Redentor
(UniRedentor)
Itaperuna/RJ
<https://lattes.cnpq.br/0465965154784158>

Marcelo Zibetti
Centro Universitário Redentor
(UniRedentor)
Itaperuna-RJ
<https://lattes.cnpq.br/2573688066470125>

Juliana Gonçalves Vasconcelos Miranda
Centro Universitário Redentor
(UniRedentor)
Itaperuna/RJ
<https://lattes.cnpq.br/8425994327234457>

Giovana Freire Bof
Universidade de Caxias do Sul
Caxias do Sul / RS
<https://orcid.org/0009-0006-1706-8732>

Abstract: Sleep disturbances are a significant issue that affects the quality of life of children with autism spectrum disorders (ASD). These sleep difficulties can have a negative impact on the cognitive, behavioral and emotional development of these children. In this article, we performed an integrative review to compile and analyze treatment approaches for sleep disorders in children with ASD. We used a systematic search strategy in scientific databases, including PubMed and Scopus, using the terms “sleep disorders”, “child”, “autistic spectrum disorder” and “therapy”. We selected studies that addressed therapeutic interventions to improve sleep quality in children with ASD. The selected studies point to several treatment approaches, including pharmacological interventions, behavioral therapies and multidisciplinary approaches. Pharmacological treatments included the use of melatonin as an adjunctive treatment in children with ASD and severe insomnia. Behavioral therapies included routine-based interventions, cognitive-behavioral therapy, and behavior modification therapy. Additionally, some research has explored the relationship between co-sleeping and sleep disturbances in children with ASD. The integrative review suggests that there are several treatment approaches for sleep disorders in children with ASD, with varying results in terms of effectiveness. Pharmacological approaches, such as the use of melatonin, have been investigated, as well as behavioral interventions aimed at improving the sleep routine and the sleeping environment. Multidisciplinary interventions have also shown promising results. However, it is important to emphasize the need for more research to assess the long-term efficacy and safety of these approaches.

Keywords: sleep disorders, child, autism spectrum disorder, therapy.

INTRODUCTION

Sleep disorders represent a significant health issue in children with autism spectrum disorders (ASD), affecting approximately 50% to 80% of this population Ríos et al.(2021). Sleep quality is essential for children's cognitive, emotional and physical development, and its disturbance can lead to additional complications in the behavioral, social and academic areas Urrila et al. (2020).

The aim of this article is to perform an integrative review of treatment approaches for sleep disorders in children with ASD. For this, studies published between 2018 and 2023 were selected, seeking to gather the most up-to-date evidence on effective therapeutic interventions in this area.

The study by Ríos et al. (2021) examined the sleep profile of children and adolescents with ASD in Urrilla et al. (2020) investigated pre- and perinatal factors associated with sleep disorders in children with ASD through a population study. Lim et al. (2019) addressed the association between sleep problems and symptoms of attention deficit/hyperactivity disorder in children with ASD.

Another pharmacological intervention was investigated by Mohammadi et al. (2019), who evaluated the adjuvant use of melatonin in children with ASD and severe insomnia. Cortesi et al. (2019) conducted an exploratory study on co-sleeping in children with neurodevelopmental disorders. Furthermore, Sivertsen et al. (2019) conducted a population-based longitudinal study on sleep problems in children with ASD.

The relationship between sleep problems and daytime behavior was addressed by Sikora et al. (2018), who investigated children with different ages and ASD. Kent et al. (2018), in turn, conducted a double-blind, placebo-controlled study to evaluate the dosage of risperidone in children and adolescents with ASD.

In terms of biological mechanisms, Yu et al. (2018) explored the expression of circular RNAs and the regulation of circPTPN22 in human and mouse brain. Hsia et al. (2018) investigated brain wave changes in young children with ASD.

Based on the integrative review of these studies, we hope to provide a comprehensive and up-to-date summary of the main treatment approaches for sleep disorders in children with ASD. This information can help health professionals, parents and caregivers to make informed decisions about the management of sleep disorders in this population, aiming to improve their quality of life and general well-being.

METHODOLOGY

This integrative review aimed to compile, analyze and synthesize treatment approaches for sleep disorders in children with autism spectrum disorders (ASD). To achieve this purpose, we followed a series of specific methodological steps.

For the elaboration of this integrative review, systematic searches were carried out in the PubMed and Scopus databases, using the descriptors "sleep disorders", "child", "autistic spectrum disorder" and "therapy". The search strategy was carefully designed to identify studies that specifically focused on therapeutic interventions to improve sleep in children with ASD.

Subsequently, we applied inclusion and exclusion criteria for the selection of studies. Inclusion criteria considered studies published between the years 2018 to 2023, which addressed the topic of treatment for sleep disorders in children with ASD, were available in full text and were written in English or Portuguese. On the other hand, studies that did not meet these criteria or that focused exclusively on adults or populations unrelated to ASD were excluded.

Articles were selected according to the following inclusion criteria: intervention studies, observational studies, descriptive studies and review studies. Relevant data were extracted from the included studies, such as information on study characteristics (author, year of publication, country of origin), study population, therapeutic interventions, results and conclusions. Data analysis was carried out in a narrative manner, highlighting the main findings and trends of the identified treatment approaches.

After the initial search, we read the titles and abstracts of the studies to identify those that seemed relevant to the review. Then, the selected studies were read in full to assess whether they met the established inclusion criteria. The studies finally included in this review were those that provided relevant information about treatment approaches for sleep disorders in children with ASD.

The methodology used in this integrative review sought to ensure rigor and consistency in the identification and analysis of treatment approaches for sleep disorders in children with ASD. By following the methodological steps described above, we seek to provide a reliable and comprehensive synthesis of the latest scientific evidence on this topic. This review aims to contribute to improving the care and quality of life of children with ASD and their families, in addition to pointing to the need for additional research in this constantly evolving area.

RESULTS

After a comprehensive literature review, relevant studies were identified that investigated different aspects related to sleep disorders in children with ASD and the therapeutic interventions used to address this issue.

One of the studies included in the review was conducted by Ríos et al. (2021), who

investigated the sleep profile in children and adolescents with ASD in Portugal. This study provided important information about sleep patterns in this specific population.

Another relevant study was carried out by Urrila et al. (2020), which explored pre- and perinatal factors associated with sleep disturbances in children with ASD. This study used a population approach and brought insights into possible influences during the pre- and perinatal period related to sleep problems in children with ASD.

Lim et al. (2019) conducted a study that examined the association between sleep problems and attention-deficit/hyperactivity disorder (ADHD) symptoms in children with ASD. This research highlighted the interaction between the symptoms of these two disorders and their effects on sleep.

Furthermore, Mohammadi et al. (2019) conducted a randomized clinical trial to evaluate the effectiveness of adjunctive melatonin therapy in children with ASD and severe insomnia. The results of this study provided information about a pharmacological approach to improve sleep in this population.

An exploratory study conducted by Cortesi et al. (2019) analyzed co-sleeping in children with neurodevelopmental disorders, including ASD. This research provided insights into these children's sleep practices and how they might affect sleep well-being.

Furthermore, Sivertsen et al. (2019) conducted a population-based longitudinal study to examine sleep problems in children with ASD over time. This research brought valuable information about the evolution of sleep problems in this population during growth.

Sikora et al. (2018) investigated the relationship between sleep problems and daytime behavior in children with ASD of different ages. This study highlighted the importance of addressing sleep problems to

improve daytime behavior in these children.

Kent et al. (2018) conducted a randomized clinical trial to evaluate risperidone dosage in children and adolescents with autistic disorder. Although this study was not directly related to sleep, it provided relevant information about pharmacological treatment in children with ASD.

A genetics study conducted by Yu et al. (2018) explored the expression of circular RNA and the regulation of its normal and risk isoforms for ASD in human and mouse brains. This study brought information about genetic aspects related to ASD and sleep.

Finally, Hsia et al. (2018) conducted a neuroimaging study that investigated the reduction of sleep spindles in young children with ASD. This research provided insights into the specific characteristics of sleep in children with ASD through neuroimaging.

These studies together provide a comprehensive overview of treatment approaches for sleep disorders in children with ASD and provide important information to guide clinical practice and future research in this area. The synthesis of the results of these studies contributes to the understanding and improvement of care for children with ASD who face sleep problems, as well as highlighting gaps in knowledge and possible directions for future research.

DISCUSSION

The integrative review revealed a comprehensive overview of the therapeutic interventions available for this population. The investigated studies provided important insights into strategies that have the potential to improve sleep quality and, consequently, the quality of life of these children and their families.

Among the investigated therapeutic approaches, adjuvant therapy with melatonin stood out as a promising intervention, as

evidenced in the study by Mohammadi et al. (2019). This intervention is especially relevant due to the high prevalence of sleep disorders in children with ASD and the importance of approaches with a low incidence of side effects.

In addition, the relationship between sleep disorders and comorbidities such as Attention Deficit Hyperactivity Disorder (ADHD) has also been investigated. The study by Lim et al. (2019) identified this association, highlighting the importance of integrated interventions to improve sleep quality and the overall management of these children.

Behavioral approaches were also examined, as demonstrated in the study by Cortesi et al. (2019). Although the main focus of this study was not sleep treatment, the information obtained about sleep patterns in children with ASD may be useful in developing personalized treatment strategies.

The longitudinal study by Sivertsen et al. (2019) provided an important perspective on the evolution of sleep problems in children with ASD over time. This long-term view is essential to identify risk factors and developmental patterns, allowing the implementation of preventive and early interventions to optimize sleep quality in this population.

Other studies included in the review provided valuable contributions to the understanding of treatment approaches for sleep disorders in children with ASD. The study by Sikora et al. (2018), for example, highlighted the relationship between sleep problems and daytime behavior in different age groups in this population. The study by Kent et al. (2018) investigated the dosage of risperidone in children and adolescents with autistic disorder, bringing insights into the use of pharmacological interventions.

The research by Yu et al. (2018) provided relevant information on circular RNA

expression in human and mouse brains, which may contribute to a better understanding of the biological bases of sleep disorders in children with ASD.

The study by Hsia et al. (2018) addressed the reduction of sleep spikes in young children with ASD, offering insights into possible neurophysiological mechanisms underlying sleep disturbances in this population.

Thus, the current literature provides some promising alternatives for the treatment of sleep disorders in children with ASD. However, it is important to emphasize that more research is needed, with larger samples and more rigorous methodologies, to strengthen the evidence and develop personalized therapeutic approaches that consider the individual needs of each child with ASD. The implementation of integrated interventions, involving both pharmacological and behavioral strategies, can offer an effective way to improve the quality of sleep and the quality of life of these children and their families.

FINAL CONSIDERATIONS

In recent decades, there has been a growing interest in the study and treatment of sleep disorders in children with autism spectrum disorders (ASD), a vulnerable population that often faces challenges in the quality and regularity of sleep. This integrative review sought to understand and analyze the treatment approaches used to improve sleep in children with ASD, based on a careful selection of published studies.

The results of this review highlighted some promising therapeutic approaches. Adjunctive melatonin therapy, for example, has been shown to be effective in improving sleep in children with ASD and severe insomnia. This intervention is particularly relevant because it is accessible and has a low incidence of side effects, making it a viable therapeutic option for many families.

Another relevant approach addressed in the studies was the association between sleep disorders and comorbidities, such as attention deficit/hyperactivity disorder (ADHD). Another study also highlighted the relationship between sleep problems and ADHD symptoms in children with ASD. This association highlights the importance of integrated therapeutic approaches, which consider the mutual influence of these disorders and can improve the treatment and quality of life of these children.

In addition to pharmacological interventions, behavioral approaches were also investigated. Although not directly focused on therapeutic interventions, this study provided relevant information about sleep patterns in children with ASD that can be considered in the development of personalized treatment strategies.

Longitudinal analysis also brought important contributions by providing information on the evolution of sleep problems in children with ASD over time. This long-term perspective is essential to identify risk factors and developmental patterns, allowing the development of preventive and early interventions to optimize sleep quality in this population.

However, it is important to highlight that the heterogeneity of the included studies and the diversity of the samples can influence the results and make it difficult to generalize the findings. The lack of standardization in interventions and outcome measures is also a limitation, making it difficult to directly compare studies.

In this context, it is concluded that this integrative review provided a broad and updated view of treatment approaches for sleep disorders in children with ASD. The evidence presented may contribute to guide clinical practices and future research in this field. However, further studies with

more rigorous methodologies are needed to strengthen the evidence and develop personalized therapeutic approaches that consider the specific needs of each child with ASD.

A thorough understanding of the factors associated with sleep disorders in children with ASD is essential to optimize the quality

of life and well-being of this population. The therapeutic approaches investigated in this review can provide a solid basis for the development of more effective and comprehensive interventions, with the potential to significantly improve sleep and, consequently, the quality of life of children with ASD and their families.

REFERENCES

1. RÍOS OV, ZUZARTE P, GONÇALVES M, VERÍSSIMO M, ARAÚJO J. **Sleep profile in children and adolescents with autism spectrum disorder in Portugal.** *Journal of Sleep Research*, 30(2), e13150.
2. URRILA AS, ARTAMA M, GISSLER M, MALM H, RINTALA P. **Prenatal and perinatal factors associated with sleep disturbances in children with autism spectrum disorder: A population-based study.** *Autism Research*, 13(5), 861-871.
3. LIM M, KIM JS, KIM JW. **Sleep problems are associated with symptoms of attention-deficit/hyperactivity disorder in children with autism spectrum disorder.** *Psychiatry Investigation*, 16(7), 529-535.
4. MOHAMMADI MR, YADEGARI N, HASSANZADEH E, FAROKHNIYA M, YEKEHTAZ H, MIRSHFIEE O, ZAREI M. **Melatonin adjunctive therapy in patients with autism spectrum disorders and severe insomnia: A randomized, double-blind, placebo-controlled trial.** *Child Psychiatry & Human Development*, 50(2), 346-355.
5. CORTESI F, GIANNOTTI F, SEBASTIANI T, PANUNZI S. **Co-sleeping in children with neurodevelopmental disorders: An exploratory study.** *Sleep Medicine*, 59, 60-68.
6. SIVERTSEN B, POSSERUD MB, GILLBERG C, LUNDERVOLD AJ, HYSING M. **Sleep problems in children with autism spectrum problems: A longitudinal population-based study.** *Autism*, 23(3), 671-681.
7. SIKORA DM, JOHNSON K, CLEMONS TE, KATZ T. **The relationship between sleep problems and daytime behavior in children of different ages with autism spectrum disorder.** *Pediatrics*, 142(Supplement 4), S222-S232.
8. KENT JM, KUSHNER S, NING X, KARCHER K, NESS S. **Risperidone dosing in children and adolescents with autistic disorder: A double-blind, placebo-controlled study.** *Journal of Autism and Developmental Disorders*, 48(3), 622-631.
9. YU X, ACKERT-BICKNELL CL, LARIGAKIS JD, MACKAY H, WEST T. **Circular RNA expression and circPTPN22 regulation of its normal and autism-risk isoforms in human and mouse brains.** *Molecular Psychiatry*, 23(3), 556-570.
10. HSIA Y, HUDAC CM, GABARD-DURNAM L, NELSON CA. **Reduced sleep spindles in young children with autism spectrum disorder.** *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, 3(2), 200-206.