



Comprehensive Mini Review of Pediatric Sleep Disorders: Types, Impact on Health and Current Management Strategies

Çocuklarda Uyku Bozukluklarının Kapsamlı Mini İncelemesi: Türleri, Sağlık Üzerindeki Etkileri ve Güncel Yönetim Stratejileri

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Abstract

This mini review explores the health implications of sleep disorders in children and examines current treatment approaches. A comprehensive analysis of recent literature from PubMed and Google Scholar, focusing on studies published between 2019 and 2024, was conducted to assess the types of sleep disorders in children, their impact on health, and effective management strategies. The review details the significant impact of sleep disorders on children's physical, mental, and emotional health, highlighting issues such as impaired glucose control, inflammation, obesity, behavioral problems, and emotional dysregulation. Effective treatment methods and management strategies include sleep hygiene, behavioral therapies, and innovative interventions like bright light therapy combined with cognitive-behavioral therapy. Early detection and comprehensive management of sleep disorders in children are crucial to improving overall child health and well-being.

Keywords: Sleep disorders, child health, sleep hygiene, treatment, prevention

Öz

Bu mini derleme, çocuklarda uyku bozukluklarının sağlık üzerindeki etkilerini incelemekte ve mevcut tedavi yaklaşımlarını değerlendirmektedir. PubMed ve Google Scholar'da 2019-2024 yılları arasında yayınlanmış çalışmalara odaklanarak, çocuklardaki uyku bozukluklarının türleri, sağlık üzerindeki etkileri ve etkili yönetim stratejileri hakkında kapsamlı bir literatür analizi yapılmıştır. Derleme, uyku bozukluklarının çocukların fiziksel, zihinsel ve duygusal sağlığı üzerindeki önemli etkilerini detaylandırmakta olup, glukoz kontrolünün bozulması, inflamasyon, obezite, davranış sorunları ve duygusal düzensizlik gibi sorunları vurgulamaktadır. Etkili tedavi yöntemleri ve yönetim stratejileri arasında uyku hijyeni, davranış terapileri ve bilişsel-davranışçı terapi ile birleştirilen parlak ışık terapisi gibi yenilikçi müdahaleler bulunmaktadır. Çocuklarda uyku bozukluklarının erken tespiti ve kapsamlı yönetimi, genel çocuk sağlığı ve refahını iyileştirmek için büyük önem taşımaktadır.

Anahtar Kelimeler: Uyku bozuklukları, çocuk sağlığı, uyku hijyeni, tedavi, önleme



INTRODUCTION

The idea that pediatric sleep health is different from adult sleep medicine was first presented decades ago. Since then, researchers have worked to describe normal sleep patterns at different ages and to create treatment plans for various sleep issues in children.^[1]

Sleep is essential for children's overall health and development. It plays a crucial role in their physical growth, cognitive abilities, and emotional well-being. Adequate sleep supports the body's growth processes, helps the brain consolidate learning and memory, and regulates mood and behavior. Without sufficient sleep, children can experience a range of health and developmental issues, making the understanding and management of pediatric sleep critical.

Various studies have highlighted the prevalence of sleep disorders in children, underscoring the significance of addressing this issue. In one study, it was found that 39.36% of children experienced one or more sleep-related problems, with a higher prevalence observed among boys compared to girls.^[2]

Another review, encompassing several studies, reported that the prevalence of sleep problems in children ranged from 15.3% to 76.3%.^[3] These findings highlight that sleep disorders affect a significant portion of the pediatric population, emphasizing the need for effective assessment and intervention strategies. For instance, a recent cross-sectional study conducted in Riyadh, Saudi Arabia, over two months from August to September 2022, identified bed-time resistance as the most prevalent sleep issue at 71.3%. This was followed by sleep-onset delay at 58.1%, difficulty waking up in the morning at 41.3%, and interrupted sleep patterns at 31%. These results align with earlier studies, such as those by Fadime et al., who found bedtime resistance to be the most common sleep problem at 48.1%, and BaHammam et al., who reported a prevalence of 26.2%.^[4] These consistent findings across different studies underscore the widespread nature of sleep issues among children and the urgent need for targeted interventions.

Sleep disorders in children can arise from a variety of factors. Medical conditions such as asthma, allergies, and gastrointestinal issues can disrupt sleep patterns. Psychological factors, including anxiety and depression, also play a significant role, as do behavioral issues and irregular sleep routines. Additionally, environmental factors like excessive screen time before bed or an uncomfortable sleep environment can contribute to sleep problems. Understanding these diverse causes is essential for effective diagnosis and treatment of sleep disorders in children.

The purpose of this review is to examine the impact of sleep disorders on child health and to explore various treatment approaches. By highlighting how sleep problems affect overall health and discussing effective strategies for management, this review aims to provide valuable insights for improving pediatric sleep care.

MATERIAL AND METHOD

A comprehensive review of pediatric sleep disorders was conducted using recent literature from PubMed and Google Scholar. Relevant studies published between 2019 and 2024 were selected based on their focus on sleep disorders, their impact on health, and management strategies. Data were analyzed to summarize the prevalence, health effects, and treatment approaches for pediatric sleep disorders.

Sleep Disorders and Child Health

Sleep disorders significantly impact children's health and development. According to the International Classification for Sleep Disorders, 3rd Edition (ICSD-3),^[5] these disorders are categorized into several groups: insomnia, parasomnias, hypersomnias, sleep-related breathing disorders, circadian rhythm disorders, and sleep-related movement disorders. Common sleep issues in children include insomnia, which may result from factors such as poor sleep habits or behavioral issues. Circadian rhythm disorders, like delayed sleep-wake phase, affect the timing of sleep. Disorders related to breathing, such as obstructive sleep apnea, interfere with normal breathing during sleep. Central hypersomnolence disorders, including narcolepsy, cause excessive daytime sleepiness. Parasomnias, such as sleepwalking and night terrors, involve abnormal behaviors during sleep. Additionally, movement disorders like restless legs syndrome can disrupt sleep. Identifying and understanding these disorders is essential for effective treatment and overall child health improvement.^[5]

Sleep disorders can have significant effects on children's physical health. Poor sleep quality and disrupted sleep patterns are linked to problems such as impaired blood glucose control and inflammation. Mixed results have been found regarding the impact of sleep duration on inflammation and blood pressure.^[6] Additionally, children with sleep issues are at higher risk for obesity, musculoskeletal pain, and injuries.^[6] Addressing these sleep problems is important for maintaining overall physical health in children.^[6]

Lack of adequate sleep can have a profound effect on children's mental and emotional well-being. Research indicates that poor sleep, including insufficient duration and quality, is associated with behavioral issues, learning difficulties, and emotional problems.^[6] Studies have found that disrupted sleep patterns are linked to an increased risk of depression and anxiety in older children and adolescents.^[6] While there is some evidence suggesting that improving sleep may help mitigate these symptoms, the exact relationship between sleep variability and specific emotional disorders remains unclear. Additionally, inadequate sleep can affect emotional regulation, making it harder for children to manage their feelings and behaviors effectively. Addressing sleep issues is crucial for supporting better mental and emotional health in children.^[6]

Treatment Approaches and Management

Addressing pediatric sleep disorders often begins with enhancing sleep hygiene. This involves setting up an ideal sleep environment—keeping bedrooms dark, quiet, and well-ventilated—and adhering to consistent sleep schedules while avoiding stimulating activities before bedtime. Monitoring and limiting caffeine and substance use are also key factors.

Behavioral and cognitive-behavioral therapies are effective for managing issues such as insomnia and irregular sleep patterns. These approaches focus on changing negative sleep-related thoughts and behaviors and establishing healthy sleep routines. Incorporating these therapies can also benefit children with related conditions like anxiety and ADHD, as they address broader behavioral and cognitive challenges impacting sleep.^[7]

For sporadic sleep terrors, reassurance to parents often alleviates anxiety, as most children outgrow the condition. Avoid intervening during episodes to prevent increased confusion and aggression. Ensure good sleep hygiene and an optimal sleep environment, as sleep deprivation can exacerbate terrors. Avoid caffeine and medications that may trigger episodes. Reduce stress and address factors that may disturb sleep, such as discomfort or environmental noises. Safety precautions should be taken to protect the child.^[8]

A study on combining morning bright light therapy with cognitive behavioral therapy (CBT) in children with delayed sleep phase disorder (DSPD) found significant improvements in sleep timing, duration, and overall sleepiness. Light therapy, involving exposure to 10,000 lux light boxes each morning, was effective in resetting the circadian rhythm and sustained benefits for six months.^[7]

When addressing pediatric sleep disorders, particularly severe cases like sleep terrors, initial medication approaches are crucial. Clonazepam may be prescribed for short-term use to mitigate frequent and severe episodes, ideally administered 90 minutes before bedtime to align with the timing of disturbances. Melatonin has also shown efficacy in managing these disorders. Additionally, tricyclic antidepressants, selective serotonin reuptake inhibitors, mirtazapine, and ramelteon are options, though their success can vary. For frequently occurring sleep terrors, anticipatory awakening—waking the child 30 minutes before the expected episode—can be effective. If underlying psychological issues are suspected, psychotherapeutic interventions should be considered.^[8]

For treating pediatric sleep disorders, several medical treatments are being evaluated. Oral iron supplements and alpha-2-delta ligands have shown potential for conditions like Restless Legs Syndrome (RLS) and Periodic Limb Movement Disorder (PLMD),^[9] although these treatments lack broad regulatory approval and are primarily supported by case reports rather than large-scale trials. There is a need for further studies, including randomized controlled trials, to confirm their effectiveness and explore other treatments such

as behavioral therapies and vitamin D. Additionally, effective strategies must be developed for managing RLS, particularly when it co-occurs with conditions like ADHD or anxiety.^[9]

In children with neurodevelopmental disorders (NDDs), the management of sleep disorders begins with sleep hygiene, similar to other pediatric groups. This includes creating a conducive sleep environment, maintaining a consistent sleep schedule, and practicing good sleep habits. Research highlights that children with autism spectrum disorder (ASD) often have low serum ferritin levels, which can negatively impact sleep. Addressing these deficiencies, along with maintaining optimal sleep hygiene, is essential for effective management.^[10]

Pharmacological interventions are frequently utilized. Melatonin has shown efficacy in managing sleep disturbances in children with NDDs, particularly those with delayed sleep phase syndrome. Controlled trials have demonstrated that doses of 5-15 mg taken 20-30 minutes before bedtime significantly improve sleep.^[10] Additionally, clonidine has been beneficial for treating sleep and behavioral disorders in children with ASD, as evidenced by pilot studies.^[10] Clonazepam is another option, particularly effective for children with Williams syndrome who experience movement arousal disorders, providing targeted relief for these specific sleep issues.^[10]

Adenotonsillectomy is the first-line treatment for obstructive sleep apnea syndrome (OSAS) in children over two years old with adenotonsillar hypertrophy, significantly improving behavior, quality of life, and polysomnographic findings. The Childhood Adenotonsillectomy Trial (CHAT) confirmed that 79% of surgical patients had normalized polysomnogram results at seven months, compared to 49% in the watchful waiting group.^[11]

These emerging approaches highlight the importance of tailored interventions based on individual needs. Continuous research and adaptation of treatment strategies will enhance the effectiveness of managing pediatric sleep disorders.

Prevention And Intervention Strategies

Early intervention programs are crucial for the early diagnosis and treatment of sleep disorders in children. Educating and raising awareness among parents and teachers through targeted campaigns can significantly contribute to better sleep health. Implementing sleep-friendly practices and support systems within school and home environments is essential to ensure that children have the proper conditions for healthy sleep routines.

Early detection and intervention for sleep disorders can be seamlessly integrated into regular child health checkups. Despite the high prevalence of these disorders, their underdiagnosis reflects a gap in awareness and access to appropriate care. Enhancing parental education about sleep's importance during these mandated checkups is essential, as primary care providers and pediatricians may often miss these issues.

Education and awareness efforts are critical. In Japan, health checkups for children at various developmental stages can include a two-week sleep log recorded by parents. This data can help identify sleep problems, offer guidance on sleep management, and suggest consultations with pediatricians as needed.^[11]

Moreover, adjustments in school and home environments are vital in preventing sleep disorders. An AI-powered application is being developed to assist parents in monitoring their child's sleep quality and alerting them to potential issues. This tool aims to facilitate timely pediatric consultations, which, in turn, can help alleviate postpartum depression and reduce the risk of child abuse by addressing the stress and poor sleep quality that often affect both children and their caregivers.^[11]

DISCUSSION

This mini-review has examined the diagnosis and treatment approaches for sleep disorders in children. Sleep disorders have extensive effects on children's health, impacting their physical, mental, and emotional development. Poor sleep can negatively influence school performance, social relationships, and overall quality of life. Moreover, it can affect parents' mental health, leading to issues in family dynamics. Therefore, early diagnosis and effective management of sleep disorders in children are crucial for their well-being and healthy development.

Despite advancements in understanding and managing pediatric sleep disorders, significant gaps remain. More research is needed to identify specific diagnostic criteria and effective interventions tailored to different age groups and special populations, such as children with neurodevelopmental disorders. Additionally, further studies should explore the long-term effects of various treatment approaches, the role of genetic and environmental factors, and the development of innovative technologies for monitoring and managing sleep disorders. Addressing these gaps will enhance our ability to prevent and treat sleep disorders, ultimately improving children's health outcomes and quality of life.

CONCLUSION

Sleep disorders significantly impact children's health and development. These disorders, as classified by the International Classification for Sleep Disorders, include insomnia, parasomnias, hypersomnias, sleep-related breathing disorders, circadian rhythm disorders, and sleep-related movement disorders. Effective treatment and improvement of overall child health necessitate the identification and understanding of these disorders. Poor sleep quality and disrupted sleep patterns can lead to issues such as impaired blood glucose control, inflammation, obesity, musculoskeletal pain, and increased risk of injuries.

Addressing these sleep problems is crucial for maintaining physical health. Additionally, inadequate sleep can profoundly affect mental and emotional well-being, contributing to behavioral issues, learning difficulties, depression, anxiety, and emotional dysregulation.

Early detection and intervention for sleep disorders are essential. Despite the high prevalence of sleep disorders, healthcare utilization remains low due to poor awareness and access to care. Educating parents and teachers through targeted campaigns is crucial. In Japan, for instance, regular health checkups for children could involve parents recording their child's sleep patterns. This information can help identify sleep problems and provide guidance on sleep management, encouraging timely pediatric consultations. Effective management includes enhancing sleep hygiene, behavioral and cognitive-behavioral therapies, and, when necessary, medication. Advanced approaches, such as combining bright light therapy with cognitive-behavioral therapy, show promising results in treating specific disorders like delayed sleep phase disorder. By addressing sleep disorders, we can alleviate related health issues and improve children's overall well-being.

ETHICAL DECLARATIONS

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