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SLEEP PATTERNS AND INSOMNIA IN ADOLESCENTS: AN OBSERVATIONAL STUDY

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Abstract

Sleep plays a vital role in adolescent health, playing a pivotal part in physical, cognitive, and emotional development. However, sleep disturbances, particularly insomnia, are prevalent among adolescents, posing significant risks to their overall well-being. This observational study examines the sleep patterns of adolescents and explores the factors contributing to insomnia in the population. Utilizing data from a diverse sample of adolescents, the study sheds light on the complex interplay between biological changes during pubertal period, environmental influences, and lifestyle habits that impact quality of sleep & patterns. The findings emphasize the need for targeted interventions to promote healthy sleep habits among adolescents to lower the risks associated with sleep disorders.

Keywords

Insomnia, Sleep, Adolescents, Sleep patterns

Introduction

ICD-11 classifies insomnia into two categories: chronic insomnia and short-term insomnia. Chronic insomnia is defined as “a persistent and frequent difficulty in falling asleep or staying asleep, occurring despite adequate opportunities and favorable conditions for sleep, resulting in dissatisfaction with sleep and impairment in daytime functions.” [1]

Sleep is an important component of overall health, particularly during adolescence, when there are significant physical, psychological, and social changes occur resulting in shortened sleep duration, in what has been characterized as ‘the perfect storm’.[2] As children go through the transition from childhood to adolescence, many shifts occur in sleep/wake patterns [3]. As adolescents progress through puberty, their circadian rhythms naturally shift toward a preference for later bedtimes, a phenomenon known as "sleep phase delay." This shift is driven by changes in the secretion of melatonin, a hormone that regulates sleep-wake cycles. During adolescence, melatonin release is delayed, leading to a later onset of sleepiness and a preference for late-night activities.[4]The developmental changes in the circadian and sleep systems we have described may be exaggerated in adolescents who receive a diagnosis of delayed sleep phase syndrome (DSPS).[5]

The inter relationship between sleep/wake cycle and circadian rhythm that accompanies the pubertal development and the social and emotional development may create substantial risk for occurrence of insomnia in adolescents.[6]

Insomnia is one of the most common sleep disturbances in adolescents.[7] Insomnia during adolescence period is mostly associated with major psychological disorders, including depression, anxiety, substance abuse, addictions and other disorders,[8] and if left untreated, can become chronic in nature[9] may also result in suicidal behavior.[10] This leads to possible negative consequences in terms of reduced functioning during day time and lowered school performance[11] as well as increased risk of traffic accidents.[12] However there are likely natural short sleepers or natural long sleepers who have lower/longer basal sleep need and, hence, would not suffer adverse consequences.[13]

Sleep schedules are thought to be derived from two primary endogenous components: a circadian rhythm system and a homeostatic drive.[14] The circadian timing system promotes wakefulness in the evening and promotes sleep in the early morning and the homeostatic drive for sleep, or sleep pressure, increases with the duration of waking and disturbances during sleep. The circadian timing system promotes wakefulness in the evening and promotes sleep in the early morning.[15]

Adolescents tend to have insufficient sleep because of a combination of late bedtimes and early rise times. Adolescent sleep is marked by a notable difference between weekday and weekend sleep patterns, including a shift to later bedtimes and an increase of 1 to 2 hours in sleep duration on weekends.[16] Adolescents then have a tendency to sleep-in on weekend mornings in order to "catch up" on this insufficient sleep.[17]

There are many stimulating activity like using mobile phones not only for calls, but also for texting, accessing the internet, watching videos or movies, playing games, listening to music, and storing other personal information[18] or eating sweets at night and caffeine intake in the afternoon or evening which affects adolescent sleep. The natural body clocks of adolescents can keep them awake until 11 PM or later, in spite of going to bed early and maintaining good sleep hygiene.[19]

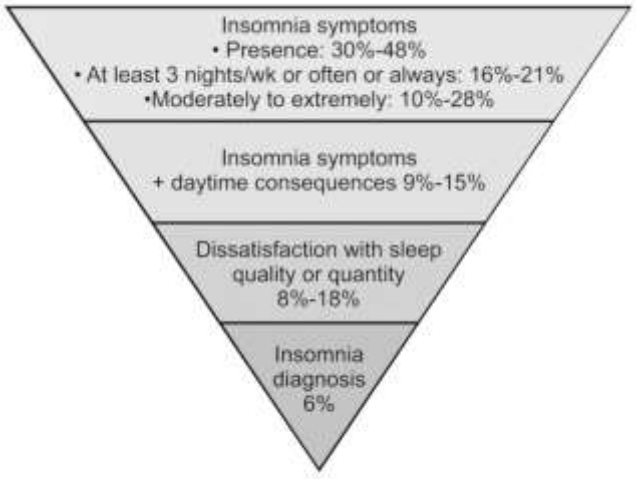

Fig 1.1 Prevalence of Insomnia Symptoms and Diagnosis. Source: Ohayon MM, et al. J Psychosom Res. 2002;53:577-583.[20]

Research has shown that insomnia treatment is most effective when it begins early in life to reduce and ideally prevent the occurrence in the teenage years.[21] Choice of sleep aid medications has daytime consequences, since those who used

drugs/substances like alcohol to fall asleep tended to report higher levels of daytime sleepiness than those who used medications.[22]

Aims and Objectives

This study aims to provide a comprehensive analysis of sleep patterns and insomnia among adolescents. By examining the relationships between sleep quality, lifestyle factors, and environmental influences, the study seeks to identify key contributors to insomnia and offer recommendations for promoting healthy sleep habits among adolescents.

Material & Methods

Study Design

This observational study employed a cross-sectional design to investigate sleep patterns and insomnia in a sample of adolescents aged 14 to 18 years attending secondary education during 2022, born between 2004 and 2008 (n = 1719) were invited to participate in the survey. The sample included 990 students out of the 1719 who agreed for the participation, yielding a participation rate of 57.59%. . Students were selected from various colleges to ensure diversity in terms of gender, socio-economic status, and academic performance. Participants provided informed consent for the study.

Data Collection

Data were collected through a combination of self-reported online questionnaires covered a broad range of sleep related issues and any associated psychological issues, daily life routine and other demographic background variables. The questionnaires included the Pittsburgh Sleep Quality Index (PSQI) to assess overall sleep quality, the Insomnia Severity Index (ISI) to evaluate the severity of insomnia symptoms, and the Adolescent Sleep Hygiene Scale (ASHS) to measure sleep-related behaviors. Participants were also asked to maintain sleep diaries for two weeks, recording their bedtimes, wake times, sleep duration, and any instances of nighttime awakenings.

Results

Sleep Patterns

The average sleep duration reported by participants was 6.5 hours per night on weekdays, significantly below the recommended i.e. 8 to 10 hours for adolescents. On weekends, sleep duration increased to an average of 8.3 hours, reflecting a pattern of sleep compensation. The majority of participants (75%) reported a sleep phase delay, with bedtimes shifting by 1 to 2 hours later on weekends compared to weekdays. This discrepancy between weekday and weekend sleep patterns was associated with greater variability in sleep and wake times, contributing to irregular sleep schedules.

Self-reported data findings indicate an average sleep onset latency of 25 minutes and a sleep efficiency of 85%. Nighttime sleep breaks were common, with 60% of participants experiencing at least one wake up break per night which were due to environmental factors such as noise or light, thunder, as well as psychological factors such as stress or anxiety/ nightmares.

Insomnia Prevalence

According to the ICD 11, 35% of participants met the criteria for clinical insomnia, characterized by difficulties falling asleep, maintaining sleep, or waking up too early. Insomnia was more prevalent among older adolescents (aged 16 to 18

years), with 40% participants having significant sleep disturbances compared to 30% of younger adolescents (aged 14 to 15 years). Female participants were also more likely to report insomnia symptoms than their male, with 38% of females experiencing insomnia compared to 32% of males.

Discussion

The findings of this study highlight the complex interplay between biological, environmental, and lifestyle factors that influence sleep patterns and insomnia among adolescents. The natural shift in circadian rhythms during puberty, combined with the demands of early school start times and the pressures of academic and social life, creates a challenging environment for maintaining healthy sleep habits. This confluence of factors contributes to a significant risk for the development of insomnia and other sleep disorders during adolescence.

Conclusion

The high prevalence of insomnia and poor sleep quality among adolescents has significant implications for their overall health and well-being. Chronic sleep deprivation and insomnia are associated with a range of negative outcomes, including impaired cognitive performance, increased risk of mental health disorders such as anxiety and depression, and physical health problems such as obesity and cardiovascular disease.

Given the importance of sleep for adolescent development, it is crucial to address the factors contributing to sleep disturbances in this population. Interventions aimed at promoting healthy sleep habits, reducing academic stress, and managing screen time are essential for improving sleep quality and reducing the risk of insomnia among adolescents.

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