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Abstract

This article is an examination of the various causes and effects of sleep deprivation and poor sleep quality in college students. Using various studies and articles as evidence, this review explores the causes of sleep deprivation in college students, and addresses the ways in which other parts of one's well-being may suffer as a result of sleep deprivation. The nature of life as a college student is not conducive to good quality sleep or sufficient amount of sleep, and the various detrimental factors to sleep quality, such as napping, technology, and social factors contribute to problems in other areas. According to existing literature, circadian rhythm-disrupting excessive napping, hyper-vigilance to technology, fear of missing out, and the social nature of life in a dorm room all contribute to sleep deprivation. Consequent problems in the areas of physical health, mental health, and academic performance are common. Such problems include weight gain, immune system deficiency, increased risk for cancer and Alzheimer's, stress, anxiety, depression, poor memory and decreased concentration, lower grades and poorer test performance. Additionally, this review addresses possible solutions to the poor sleep quality that seems to be inherent in college life, such as sleep hygiene courses incorporated into program requirements, as well as areas for further research, such as the desire for college students to nap.

Keywords

sleep deprivation, sleep quality, college students, causes, effects

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College students are some of the most sleep deprived people in the country (Otenyo, 2015). In fact, up to 60% of college students suffer from poor sleep quality (Schlarb et al., 2017). Poor quality sleep can result from a number of things, including delayed sleep onset, decreased sleep duration, and increased number of sleep disturbances. These sleep problems can impact the health and daily life of college students. This literature review will address the common causes of poor sleep and the physical, mental health, and academic impacts of poor sleep in college students, by reviewing and synthesizing existing research, as well as discuss possible solutions and opportunities for further research. The review will be organized into two sections, causes, and effects, as well as subsections addressing specific aspects of sleep.

Causes of Poor Sleep in College Students

Napping

One possible cause of poor sleep is frequent or excessive napping, which college students often fall victim to. In a 2015 study by Ye, 75% of participants reported napping in the month prior to the survey, with 42.9% reporting having napped at least once per week. According to the National Sleep Foundation, napping, especially at night, can alter the sleep cycle by shifting circadian rhythms. Since napping after 2 pm results in more slow-wave sleep, you might have trouble falling asleep at a reasonable time later that night (Pacheco, 2020). This may lead to negative health consequences such as depression, decreased glucose tolerance and insulin sensitivity, altered adrenal function, and increased evening cortisol levels (Ye, 2015). Lastly, longer naps can cause sleep inertia, which is the transitional state between sleep and wake, and often comes

with confusion, grogginess, and cognitive deficits. There is evidence that all of these factors can contribute to poor sleep quality because students who reported napping over 2 hours had an average score 2 points higher on the Pittsburgh Sleep Quality Index (PSQI) than those who reported napping for 1 hour. Furthermore, 77.6% of frequent nappers were the most likely to identify themselves as “night owls” but felt the least satisfied with the amount of sleep they got on school nights.

Technology

College students are also avid users of technology and social media, both of which may also prevent them from getting good quality sleep. Research has demonstrated that individuals who excessively use computers and phones in their bedroom have later bedtimes and tend to wake up later in the morning (Dowdell and Clayton, 2019). Having the world at their fingertips, young adults have developed hypervigilance when it comes to their phones; waking up at night at the sound of their notifications and keeping phones close during sleep only fuels this. Some students even engage in sleep texting, which is when an individual sends a text while in a sleep state, which is aided by the hypervigilance. In the Dowdell and Clayton study, 72.6% of students engaged in sleep texting and had lower sleep quality ratings than non-sleep texting students. In the Adams et al. study, 67% of the sample reported using their cell phone before going to sleep (Adams et al., 2017). This has been linked to difficulty falling asleep, frequent awakenings at night, or early wake times. Exposure to device lighting before bed, even if only for an hour to two, also delays the release of melatonin (Wood et al., 2013), and therefore delays the circadian rhythm. These sleep interruptions, combined with their schedules, may affect the students’ sleep duration and quality, chronically depriving them of sleep, and therefore sleep

debt accumulates. This contributes to students’ fatigue.

Social Factors

The social nature of college students’ lives can also contribute to sleep problems and lack of good quality sleep. Fear of missing out, or FOMO, is one aspect of students’ social lives that may get in the way of their sleep. FOMO is the anxiety that something exciting, interesting, or fun is happening elsewhere and you’re not involved in it. According to a 2017 study, nearly three quarters of young adults experience this (Adams et al., 2017). Additionally, those high in FOMO tended to use Facebook sooner after waking and before going to sleep (Przybylski et al., 2013). In Adams et al., a majority of students admitted to staying up later in order to socialize with peers on campus and people from back home via social media, leaving them restless and unable to fall asleep once in bed. Another aspect of the social nature of college students’ lives is community living. Many students live in dorms and residence halls where people socialize in the halls while others are trying to sleep. Living in a social environment can make it difficult to prioritize sleep, because of both the physical distractions and the fear of missing out on something happening outside your door.

Effects of Poor Sleep in College Students

Physical Health

Many do not realize just how important sleep is, and not getting enough sleep can pose threats to one’s physical health. In fact, continued lack of sleep can actually lead to death. In patients with progressive insomnia, patients just stop sleeping completely after several months, losing many basic brain and body functions. After 12-18 months of this, they will die. Additionally, sleep “restocks the armory of our immune system”, helping to fight cancer, infection, and other illnesses,

circulating glucose, regulates our appetite, and maintains a healthy gut. Regularly getting less than 6 or 7 hours of sleep can damage your immune system, which can double your risk for cancer, and is a factor in whether or not you may develop Alzheimer's (Walker, 2018). When one is tired or sleep deprived, they may notice that they make unhealthy and impulsive food choices or have more intense craving. This is because sleep regulates our appetite and ability to feel satiated, and therefore helps to control body weight. Epidemiologists have observed in their studies an increase in cardiovascular events in participants with only 5 to 7 hours of sleep per night (Afandi et al., 2013). According to research by Lorenzetti in 2020, studies have indicated that sleep restriction, which was operationally defined as sleeping approximately four hours a night for 10 nights, resulted in elevated cortisol levels. This can lead to increased sympathetic activation, keeping individuals up at night and delaying the release of melatonin, delaying sleep onset latency, or time it takes to fall asleep, and decreasing sleep duration. The resulting consequence is poorer sleep quality, leading to sleep deprivation.

Mental Health and Cognition

Many college students who are sleep deprived also run into struggles with their mental health and cognitive function. According to Afandi et al. (2013), sleep deprivation of less than six to seven hours per day can lead to serious impairment of cognitive and psychomotor function. This includes reduced concentration, memory and poor thinking, and daytime dysfunction. Additionally, in the sample of a study by Becker et al. (2018), ADHD-HI symptoms were significantly associated with increased sleep disturbances. ADHD-IN symptoms were significantly associated with poorer sleep quality and increased daytime dysfunction. Anxiety symptoms were

associated with increased sleep disturbances and sleep medication use, and depressive symptoms were associated with increased daytime dysfunction. Overall, ADHD-IN, anxiety, and depression symptoms were each associated with significantly higher PSQI scores. In the same 2020 research, Lorenzetti reported significant correlations between sleep quality, insomnia severity, and sleepiness and increased total mood disturbance, perceived stress, and depressive symptomatology. This tells us that sleep problems may be correlated with the symptoms of numerous mental health issues and therefore, this is a negative effect of poor sleep quality. However, there are possible critiques to this conclusion. For one, it is important to note that sleep problems, or excessive sleep resulting in poor quality sleep, are already symptoms for numerous mental health issues, namely depression and anxiety. Additionally, poor quality sleep could worsen existing mental health issues. Furthermore, it is possible that both of these are from where the association between sleep problems and mental health issues arise.

Lastly, another detriment to mental health when an individual is not getting enough sleep is in regard to cognition. Lorenzetti (2020) describes how results of sleep studies have consistently shown that sleep deprivation increases reaction times and poor performance in attention and vigilance tests. According to Walker, sleep improves our ability to learn, memorize, and make logical decisions, and allows our brains to navigate the social world we live in. Sleep also enhances our ability to make new memories, and sleeping well before, during, and after learning can help us protect newly acquired information. Without sleep, an individual's brain becomes less effective at absorbing new information and the ability to retain recently learned information is impaired (Dowdell and Clayton, 2018).

According to Lorenzetti (2020), working memory capacity decreases when sleep is restricted. Cognitive deficits in college students can pose problems considering the rigorous academic problems and schedules they may be involved in.

Academic Performance

A major consequence of sleep deprivation and poor sleep in college students is the possibility for academics to suffer. Poor sleep quality, together with shortened sleep duration, late bedtimes and rise times, and inconsistent sleep and wake schedules, has been shown to negatively affect academic performance in young adults. In the Ye study, students who reported being frequent, long, or late nappers had either a lower GPA or were more likely to oversleep and miss or be late to class, the latter being at 62.7% of the sample. According to Afandi et al. (2013), poor academic performance, often resulting in poor grades, was also associated with sleep deprivation to less than six to seven hours a day. According to Becker, poor sleep quality, shortened sleep duration, and delayed sleep onset latency can have a significant impact on college students' daytime functioning. These sleep difficulties put students at risk of poorer academic functioning, emotional dysregulation, and increased daytime sleepiness. In the sample of a study by Okano et al. (2019), longer sleep duration, higher quality sleep, and more consistent sleep were associated with better academic performance. Additionally, longer sleep duration and better sleep quality during the full month before a midterm were more associated with better test performance, rather than just the night before the exam. Furthermore, sleeping well while the information on the exam was being taught may be more crucial to performance on the exam due to the cognitive effects of sleep mentioned earlier. That is, good sleep may assist in the storage of information in long term memory.

Discussion

Possible Solutions

Sleep deprivation in college students is undoubtedly a problem. However, there may be opportunities to get students sleeping more and sleeping better. In a study by Baroni et al. (2017), a group of students participated in a sleep course designed to teach cognitive and behavioral strategies for poor sleep hygiene, and then put those strategies into practice. The practice of the strategies taught were measured using individual assessment of sleep behaviors and sleep hygiene via sleep logs. Students learned how to use a worry diary to address anxiety that could possibly keep them up, and the course also addressed historical and cultural elements of sleep, anatomy, physiology, sleep disorders, and dreams. Controls were enrolled in a child and adolescent psychopathology course that did not have a sleep education component. When looking at the students' sleep logs, there was a trend of higher total sleep time and greater sense of feeling well rested in the sleep course students compared with the control group. Control students who dropped the course had significantly higher PSQI scores than those who continued participating. Additionally, the sleep course students who dropped the course had significantly lower scores on the Morningness Eveningness Questionnaire (MEQ) compared to those who completed the study. Lastly, sleep course students felt their sleep onset latency was shorter, and in a follow-up, their MEQ scores were higher. For reference, lower MEQ scores indicate evening preference while higher scores indicate morning preference, and higher PSQI scores indicate poorer sleep quality. These results indicate that interventions that address poor sleep by combining sleep education and cognitive behavioral strategies have the potential to improve sleep problems or problematic sleep

behaviors. Adding a sleep education component to college curriculums may help students in achieving their goals in the healthiest way possible.

Further Research

While research on sleep in college students and sleep in general is well established, there is always room for further research. One topic of possible interest could be why college students nap and whether napping could suggest underlying sleep disorders. Could a frequent napper have a sleep disorder? Additionally, few studies have looked at whether or not behavioral strategies and sleep education improve mood and anxiety. Furthermore, it could be beneficial to conduct more studies that examine the impact of interventions for both sleep and mental health and whether intervention type needs to differ depending on the specific sleep and/or mental health problems present (Becker, 2018).

Conclusion

With their rigorous schedules and dedication to academics, college students need more sleep than ever before. However, they are increasingly sleep deprived, and this may be due to the various aspects of their busy lives,

such as napping, technology, and their social environments. Any of these factors can contribute to college students so commonly not getting enough sleep and this has many consequences on physical and mental health, as well as academics. Sleep deprivation can damage the immune system, make one more susceptible to infection, cancer, and Alzheimer's, disrupt glucose circulating and regulation of appetite, and impact gut health. Additionally, sleep deprivation can lead to impairment of cognitive and psychomotor function, such as deficits in concentration, memory and thinking. Sleep deprivation is also correlated with many mental illness symptoms. Lastly, academics may be affected as well, with students being late to class, earning lower GPAs, and doing worse on exams. These effects of sleep deprivation in college students can be remedied with education on the importance of sleep and how to maintain good sleep habits and hygiene. The hope of such education measures is to bring awareness to the susceptibility of college students to become sleep deprived and encourage preventative action in taking back control of their well-being, starting with their sleep.

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