Sleep Disorders and Deprivation Causes and Effects on College Students

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Introduction

When told to picture a college student, a picture of a student in a library frantically studying for their next exam will most likely come to mind. Others might picture college students in a social environment among their peers, participating in a sorority, or even at a raucous party. What most will not picture a college student doing is simply sleeping. A growing and unattended problem among college students is their common day-time sleepiness and increased sleep disorders. A student's sleep is no longer driven by the light and dark cycle but rather but their school schedule, academic load, and socialization.

To maximize success in college, an obstacle most students have now endured is a lack of sleep and potential sleep disorders. What most do not know is this could actually do the opposite and hurt academic performance (Allan, 2015). Current research has shown that fifty percent of college students report daytime sleepiness and seventy percent experience insufficient sleep (Hershner, 2014). This can adversely affect one's academic performance due to sleep having vital biological effects on the human body (Gaultney, 2010). According to The American Academy of Sleep Medicine, students that maintain a sufficient amount of sleep per night performed better on memory and motor tasks than students deprived of sleep ("College Students", 2015).

Although these facts hold true, there seems to be a continuous increase in sleep disorders experienced by college students and there is a lack of research pertaining to the specific reason(s). One group hypothesized caffeine and alcohol ingestion affect sleeping patterns and lead to high levels of daytime sleepiness (Giri, Pa, et al., 2013). Students lacking knowledge on

sleep disorders can be one potential reason leading to disorders left untreated. An important finding showed that students at risk for a sleep disorder in their freshman year are more likely to leave university before graduating (Allan, 2015). This paper will highlight the different sleep disorders and the effects of sleep deprivation on a student academic performance. It will look at the trends of sleep within college students and the different factors that lead to the lack of sleep. This paper will also elaborate on the effects of sleeplessness on mental health and the different body systems and it will also discuss helpful tips to get a good night's sleep.

Purpose and Biological Science Behind Sleep

Sleep is known to play a significant role in the development of the brain. It serves multiple purposes that are essential to the brain and body (Clear). To begin, the brain goes about its normal neural activity throughout the day, and, in the process, it accumulates waste products (Clear). These waste products are flushed out during both waking hours and while sleeping; however, they are eliminated at twice the rate during sleep due to the brain cells shrinking by 60 percent (Clear). Relying on expelling these waste products while in one's waking stage can allow the products to accumulate, resulting in neurological disorders such as Alzheimer's disease (Clear).

Another purpose of sleep is memory consolidation (McGaugh, 2012). Memory consolidation is the process by which the brain converts short-term memory to long-term memory (Cherry, 2017). A decrease in the amount of sleep may hurt one's ability to form both concrete memories (facts and figures) and emotional memories (McGaugh, 2012).

Additionally, sleep is most important on one's metabolic health (Bjorvatn, 2007). A recent study shows that when one sleeps for 5.5 hours instead of 8.5 hours per night, energy is burned off using carbohydrates and proteins rather than fats resulting in fat gain and muscle loss (Clear). In addition, inconsistent and abnormal sleep patterns has a positive correlation with insulin insensitivity and metabolic syndrome consequently increasing the risk of diabetes and heart disease.

Although the purpose of sleep is known, studies have been conducted to determine the amount of sleep one should receive nightly. One collaborative study from the University of Pennsylvania and Washington State University split healthy men and women into four groups (Van Dongen, H P, et al., 2004). The first group went three days without sleeping, the second group slept for four hours per night, the third group slept for six hours per night, and the fourth group slept for eight hours per night (Van Dongen, H P, et al., 2004). The groups that slept for 4, 6, and 8 hours were kept to these patterns for two weeks (Van Dongen, H P, et al., 2004). The purpose of this experiment was to determine the necessary amount of sleep. The participants that slept 8 hours showed no signs of cognitive decrease, attention lapses, and/or motor skill declines (Van Dongen, H P, et al., 2004). By contrast, participants that slept 4 to 6 hours daily saw an increase in these symptoms (Van Dongen, H P, et al., 2004). There was also additional unexpected findings with this study. First, sleep debt was noticed to be cumulative (Van Dongen, H P, et al., 2004). After the first week of the study, 25 percent of the 6 hour participants were falling asleep throughout the day (Van Dongen, H P, et al., 2004). This worsened during the second week when the 6 hour participants were performed as those that stayed up for two days

straight (Van Dongen, H P, et al., 2004). Additionally, participants did not realize their performance was declining (Van Dongen, H P, et al., 2004).

The Sleep Cycles and Circadian Rhythm

Sleep is studied using an electroencephalography (EEG) which measures the different patterns of electrical neural activity within different portions of the brain (Macnow, 2016). The patterns from the EEG correlate with the different stages of sleep along with the correlating waves: beta, alpha, theta, and delta (Macnow, 2016). Beta and alpha waves characterize brain activity during the wake cycle when neurons are randomly firing (Macnow, 2016). Beta waves have a high frequency and occur when a person is fully awake and alert (Macnow, 2016). Alpha waves have a lower frequency than beta waves and they occur when someone is awake but relaxing with their eyes closed (Macnow, 2016). As a person dozes they enter Stage 1 of sleep which is detected by the EEG with theta waves (Macnow, 2016). Theta waves have irregular waveforms, lower frequencies, and higher voltages (Macnow, 2016). As a person falls deeper into sleep, they enter Stage 2, characterized by theta waves, sleep spindles, and K complexes (Macnow, 2016). In Stages 3 and 4, a person falls into deep sleep; these stages are known as slow-wave sleep (SWS) (Macnow, 2016). The waves on the EEG have low frequencies and high voltages and experience delta waves (Macnow, 2016).

Stages 1-4 of sleep are known as non-rapid eye movement (NREM) sleep (Macnow, 2016). In between the stages, there is a random stage called rapid eye movement (REM) (Macnow, 2016). This stage is characterized with aroused levels similar to wakefulness but the

muscles are paralyzed (Macnow, 2016). This is called paradoxical sleep (Macnow, 2016). This stage is associated with the person dreaming along with memory consolidation (Macnow, 2016).

Furthermore, one's cycle of waking and sleeping is controlled internally through a system called circadian rhythm (Macnow, 2016). This is typically a 24-hour clock that can be affected by external cues such as darkness and light (Macnow, 2016). Circadian rhythm is also signaled by one's biochemistry (Macnow, 2016). Melatonin, a serotonin-derived hormone synthesized in the pineal gland, directly stimulates sleepiness (Macnow, 2016). The pineal gland is controlled by the hypothalamus which is directly connected to the retina; as the retina notices a decrease in light, melatonin is released (Macnow, 2016). Cortisol, a steroid hormone produced in the adrenal cortex, does the opposite in that it increases with increasing light (Macnow, 2016). Increasing light releases corticotropin releasing factor (CRF) from the hypothalamus (Macnow, 2016). CRF releases adrenocorticotropic hormone (ACTH) from the anterior pituitary, and this stimulates the release of cortisol (Macnow, 2016). To summarize, melatonin contributes to sleepiness, and cortisol contributes to wakefulness (Macnow, 2016).

Sleep Disorders

Sleep disorders are separated into two categories: dyssomnias and parasomnias (Macnow, 2016). Dyssomnia is when a person is having trouble falling asleep, staying asleep, or avoiding sleep (Macnow, 2016). Parasomnia is a condition in which one has abnormal movements while sleeping (Macnow, 2016).

Insomnia is the most common sleep disorder and is connected with anxiety, depression, medications, or disruption of sleep cycles and circadian rhythm (Macnow, 2016). It is a disorder in which one has difficulty falling asleep or staying asleep (Macnow, 2016). This makes insomnia a dyssomnia sleep disorder. In contrast, narcolepsy is when one has little voluntary control while sleeping (Macnow, 2016). Common symptoms of narcolepsy include: cataplexy, sleep paralysis, hypnagogic and hypnopompic hallucinations (Macnow, 2016). Cataplexy occurs during waking hours and it is a loss of muscle control and sudden intrusions of REM sleep (Macnow, 2016). Sleep paralysis occurs when one is awake and loses the sensation to move (Macnow, 2016). Hypnagogic and hypnopompic hallucinations are hallucinations that occur when falling asleep or awakening (Macnow, 2016).

Another common dyssomnia disorder is sleep apnea (Macnow, 2016). This disorder is characterized by a person who stops breathing during sleep (Macnow, 2016). People with this disorder will often continuously wake up during their sleep to breathe (Macnow, 2016). There are two kinds of sleep apnea: obstructive and central (Macnow, 2016). Obstructive sleep apnea occurs when the trachea or pharynx is blocked and prevents airflow to the lungs, while central sleep apnea occurs when the brain fails to send the correct signals to indicate breathing (Macnow, 2016).

A sleep disorder that occurs during slow wave sleep is somnambulism, also known as sleepwalking (Macnow, 2016). When one is in a slow wave sleep cycle, he/she is in deep sleep where it is difficult to awaken (Macnow, 2016). This typically results in the person having no memory of their sleepwalking episodes the next morning (Macnow, 2016). Patients may eat, talk, and even drive during episodes of sleepwalking after which the patient will return to their

bed and fall asleep with no knowledge of having done these activities (Macnow, 2016). Although waking up a sleepwalker will cause no harm, it is advised to guide the sleepwalker back to bed to avoid disrupting their slow wave sleep (Macnow, 2016).

Another slow wave sleep disorder is night terrors (Macnow, 2016). Night terrors are characterized by a person exhibiting periods of extreme anxiety during a slow wave sleep cycle (Macnow, 2016). This disorder is commonly, but not exclusively, seen in children. (Macnow, 2016). Symptoms include screaming, thrashing, high heart rate, and rapid breathing (Macnow, 2016).

Another common sleep disorder is sleep deprivation. Sleep deprivation can be caused by one night of sleeplessness or multiple nights with poor-quality, short-duration sleep (Macnow, 2016). People experiencing sleep deprivation have shown signs of irritability, mood disturbances, decreased performance, and slowed reaction time (Macnow, 2016). When one finally sleeps for a good duration of time following the sleep deprivation, they experience REM rebound to permit them to sleep normalling (Macnow, 2016). REM rebound is simply a greater duration of REM sleep than a normal sleep cycle (Macnow, 2016).

Sleep Disorders Correlation to College Student

Sleep disorders are shown to occur in college students at a similar frequency as that in adults (Kling, 2010). A study was done with 1845 students from a large state university (Kling, 2010); the students averaged an age of 20.38 years old, had a median GPA of 2.77, and ranged in a variety of ethnicities (Kling, 2010). The research found that 27% of the 1845 students showed

symptoms of at least one sleep disorder (Kling, 2010). The most common sleep disorders displayed were narcolepsy and insomnia (Kling, 2010). To reiterate, narcolepsy is when one experiences voluntary control while sleeping and insomnia is is a disorder characterized by difficulty falling or staying asleep (Macnow, 2016). Following narcolepsy and insomnia, other symptoms found were restless legs syndrome/periodic limb movement disorder, circadian rhythm disorder, affective disorder, obstructive sleep apnea, and hypersomnia (Kling, 2010).

A study performed at the University of North Carolina at Charlotte by a psychology professor, Jane Gaultney, on undiagnosed sleep disorders found that students who were at risk of a sleep disorders their first semester of college were more likely to leave the university (Allan, 2015). For three years, Gaultney screened incoming freshman and accessed their baseline sleep patterns, their risk of sleep disorders, their GPA, and their retention rate (Allan, 2015). Students that exhibited sleep disorders commonly expressed ADHD and mood swings (Allan, 2015). This could further be led to academic struggles and lower grade point averages (Allan, 2015). There was also a correlation between depression and sleep disorders where depression led to lowered motivation (Allan, 2015). Overall, Gaultney extrapolates that enough sleep allows humans to perform their activities of daily living better (Allan, 2015).

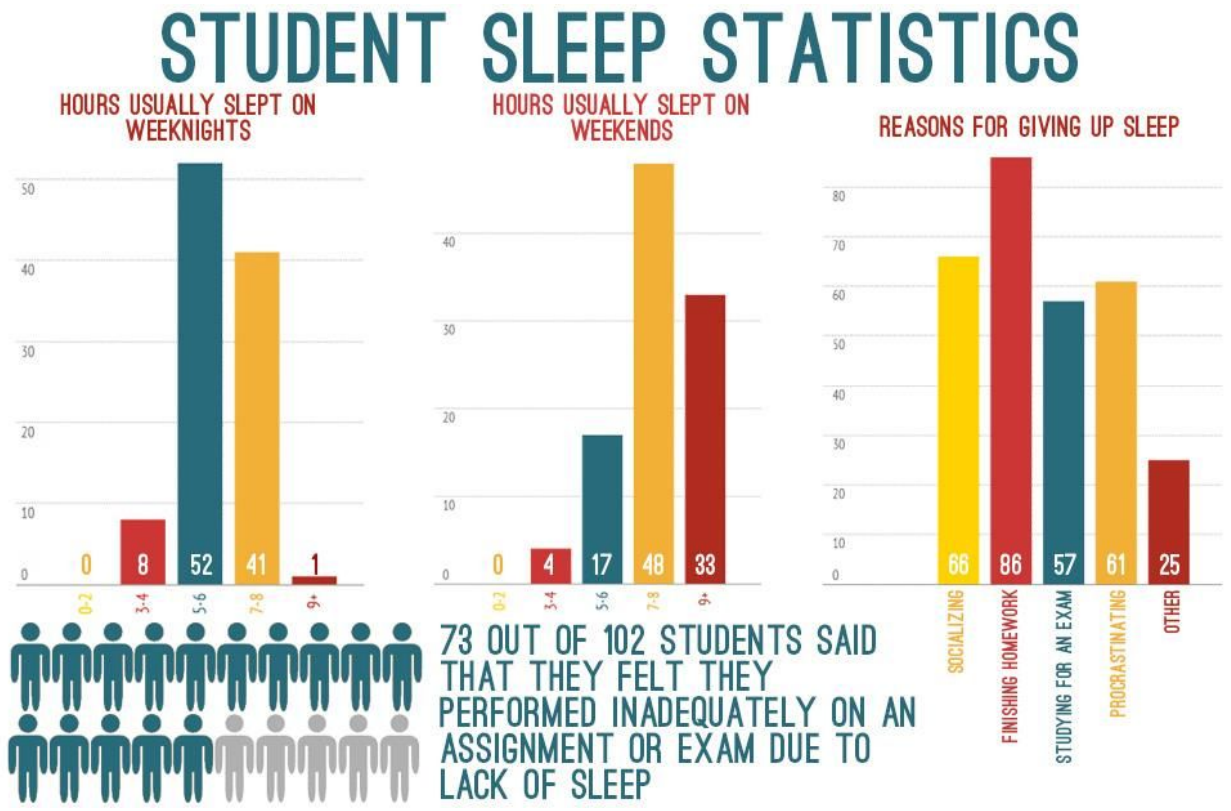
Medical students are known to have a challenging academic load which could contribute to poor sleep quality beyond that of the general population. A study published in The Journal of Clinical Sleep Medicine studied sleep disturbances among medical students (Azad, 2015). This study focused on whether medical students have a sleep problem, the extent of the problem, and if their sleep disturbance had any effect on academic performance or quality of life (Azad, 2015). The results of this study indicated that medical students indeed were very commonly diagnosed

with a sleep disorder, and its prevalence was much higher than non-medical students and the general population (Azad, 2015). Lack of sleep was found to be caused by medical students' attitudes, knowledge of sleep, and academic demands along with other causes that were not completely understood (Azad, 2015). This result is a cause of confusion and concern; medical students should be educated on the importance of sleep as part of their medical education, yet they were among the most commonly seen with sleep deprivation (Azad, 2015).

To understand why college and medical students suffer from sleep disorders arises from lack of sleep awareness. Data shows that medical students generally understand sleep disorders to be an important problem in the population, but actually know little about sleep problems they may suffer from (Azad, 2015). For example, students did not know that restless leg syndrome, sleep-talking, and bruxism are considered sleep disorders (Azad, 2015). Other studies showed that 76.8% of students assumed they and/or their friends could be suffering with a sleep disorder while only 44.8% actually consulted a doctor (Azad, 2015). In addition, certain medical students that studied sleep hygiene during their final years of medical school still lacked adequate knowledge and had many misconceptions of sleep (Azad, 2015). One interesting (false) belief students had was that one could overcome a low amount of sleep with willpower (Azad, 2015).

In addition to academic stress, alcohol and cell phone usage before bed have also been found to correlate with bad sleep quality and sleep disorders in college students. Alcohol is a depressant and studies have shown that 20% of Americans use alcohol to go to sleep (Hale). Although alcohol may cause a person to fall asleep, it has been shown to contribute to poor sleep quality (Hale). Alcohol affects the normal production of chemicals in the body that triggers sleepiness by increasing adenosine (Hale). Adenosine is a sleep-induced chemical that allows

one to fall asleep quickly, but it also subsides quickly, making one more likely to wake up in the middle of the night (Hale). Alcohol also blocks REM (rapid eye movement) sleep which is the most restorative stage of sleep (Hale). Additionally, the average college student uses their cellular device and other technologies before going to bed. The blue light emitted by cell phones, computers, tablets, and televisions negatively affects the production of melatonin ("How Technology Impacts"). This makes it more difficult to fall and stay asleep ("How Technology Impacts"). It has been shown that technology keeps the mind engaged and the brain alert ("How Technology Impacts"). This does not allow the brain to unwind after an entire day surrounded by technology ("How Technology Impacts").



Graph 1: Student sleep statistics (Dispenza, 2017).

To illustrate the points above, these graphs summarize a students sleep statistics. The average student, overall, does not get enough sleep on an average school day, and the reasons are listed above (Dispenza, 2017). The most common reason seemed to be finishing homework with socializing and procrastination being the second most common (Dispenza, 2017).

Sleep on Health and Performance

As briefly discussed, quality of sleep can have a direct relationship on academic performance. This is derived from insufficient sleep having a negative impact on one's mental functioning which can affect their performance on examinations (Zeek, 2015). Insufficient sleep is generally defined as less than 7 hours of sleep a day for adults (Zeek, 2015). It can decrease general alertness and attention which will slow cognitive procession (Zeek, 2015). It also affects the specific brain structure called the prefrontal cortex (Zeek, 2015). The prefrontal cortex is responsible for executing higher brain function such as language, working memory, logical reasoning, and creativity (Zeek, 2015).

In addition, college students are notorious for their "all-nighters" before an exam, where students forgo sleep to study. A study published in ScienceAlert describes the effects of staying up all night to study (Nield, 2015). A neuroscientist from Norway studied these effects on 21 healthy young men recruited to undergo diffusion tensor imaging (DTI) tests (Nield, 2015). The tests indicate water diffusion in the body which correlates with the health of the nervous system (Nield, 2015). The participants were assigned to stay awake for 23 hours and to avoid alcohol, caffeine, and nicotine (Nield, 2015). Following the experiment, the neuroscientist noted

widespread fractional anisotropy; a degradation of neuron connections in the brain (Nield, 2015). These changes were found near the corpus callosum, brainstem, thalamus, fronto-temporal and parieto-occipital tracts (Nield, 2015). With regard to college students, this could affect their ability to focus during an exam. There were questions as to how permanent this could become. It was hypothesized that these effects are short term if a person only goes one night without sleep (Nield, 2015). However, long lasting effects and alterations to the brain could occur if a person is consistently missing sleep (Nield, 2015). The neuroscientist examined the patients and reported two of the subjects did not show the same brain patterns, indicating that the physiology of some human subjects are better suited to handle lack of sleep (Nield, 2015).

Sleep deprivation has many long and short term effects on different body systems. The first is the central nervous system. Sleep allows the central nervous system to continue working properly and chronic insomnia will interrupt the body sending signals through the nervous system (Watson, 2017). This could lead to forgetfulness, impatience, and mood swings (Watson, 2017). Continued sleep deprivation can lead to hallucinations and mania which includes impulsive behavior, depression, paranoia, and suicidal thoughts (Watson, 2017).

The second body system affected by sleep deprivation is the human immune system. During sleep the immune system produces infection-fighting chemicals such as cytokines (Watson, 2017). These cytokines not only fight off pathogens, but they also give the immune system energy to defend against illnesses (Watson, 2017). Sleep deprivation would decrease these effects, and in the long term, this could result in diabetes and heart disease (Watson, 2017).

Sleep apnea, a sleep disorder in which one stops breathing during sleep, interrupts and decreases the quality of sleep (Macnow, 2016). Sleep apnea is connected with the respiratory

system and may result in vulnerability to respiratory infections including the common cold and flu, and in some circumstances, chronic lung illness (Watson, 2017).

Moreover, the digestive, cardiovascular, and endocrine systems are all affected by sleep deprivation. Sleep affects the levels of leptin and ghrelin; hormones that control the feeling of hunger and fullness (Watson, 2017). Leptin signals when one has had enough to eat and ghrelin is an appetite stimulant (Watson, 2017). Without sleep, the brain decreases leptin and increases ghrelin which can result in weight-gain and obesity. (Watson, 2017). In regards to the cardiovascular system, sleep plays a role in health of heart and blood vessels; this includes keeping blood sugar, blood pressure, and inflammation levels in check (Watson, 2017). The long term effects of sleep disorders include an increased risk of cardiovascular disease that leads to heart attack and stroke (Watson, 2017). The endocrine system, a collection of glands that produce hormones, is negatively affected by sleep disorders. (Watson, 2017). Certain hormones, such as testosterone, require a adequate sleep in order to be produced,waking throughout the night could negatively affect this production (Watson, 2017).

Correspondingly, sleep disorders and deprivation also result in profound psychological effects. When the brain is sleep deprived, it is not as efficient and will need to work harder than usual (Dean, 2014). Brain image studies have shown a sleep deprived brain pumping more energy into the prefrontal cortex to compensate for the effects of sleep deprivation(Dean, 2014). Referring back to the psychological effects, short-term and long-term memory are both affected with sleep deprivation. Without short-term memory, the ability to perform complex tasks is compromised, and without long-term memory, one cannot consolidate memories (Dean, 2014).

Furthermore, sleep deprivation results in lack of concentration, distraction, and. difficulty planning and coordinating actions (Dean, 2014).

Most college students have additional factors that further affect their health in regard to sleep disorders and deprivation. First, most college students rely on caffeine as a source of energy to compensate for lost sleep. It has been scientifically proven that caffeine does not replace sleep and the long-term effects of sleep deprivation are still in effect (Smith, 2017). The Walter Reed Army Institute of Research conducted a brief research study to investigate this topic (Smith, 2017). There were 48 participants assigned to sleep only five hours a day, and only half the participants were given caffeine (Smith, 2017). A study was done to test their alertness, and the group given caffeine did notably better (Smith, 2017). However, after the third day of the study, the boost of caffeine began to subside which proved caffeine has its limits (Smith, 2017).

Reasoning to College Student Sleep Deprivation and Solution

College students are commonly being diagnosed with sleep disorders and sleep deprivation for a variety of reasons. The first approach to solve this problem is to understand the underlying cause. This first stems from students having poor sleep behaviors including an inconsistent sleep-wake schedule, drinking caffeine after lunch, and not sleeping in a quiet environment **(**Hershner, 2014). Student should go to bed at the same time and wake up at the same time every day. This will result in a consistent sleep-wake cycle for the body to easily follow. The sleep-wake cycle should also be within 7-8 hours for adequate sleep. Consumption of caffeine should be limited to the morning hours, and students should always be sleeping in a

quiet environment. Both these factors will allow the mind to relax and get a good night's sleep without the effect of caffeine and noise.

Additionally, statistics show four out of five college students drink alcohol and approximately 40% of students binge drink at least 4-5 drinks every two weeks **(**Hershner, 2014). Alcohol shortens sleep, promotes fragmented sleep, and can increase one's chance for obstructive sleep apnea **(**Hershner, 2014). A solution to this problem is to consume little to no alcohol. Alcohol has effects on other parts of the body and can hurt one in more than just their sleep.

In addition, an increasingly growing problem is the use of stimulants to increase concentration when studying and to stay awake for longer periods (Hershner, 2014). Studies have shown that students use stimulants more than non-students that are of the same age (Hershner, 2014). "A survey at 119 colleges and universities across the US found a 6.9% lifetime prevalence for the use of stimulants. Other studies show prevalence as high as 14%. Men are more likely than women to use stimulants, as well as caffeine and energy drinks." (Hershner, 2014). Stimulants can increase sleep latency and suppress REM sleep resulting in worsening sleep quality (Hershner, 2014). This study correlates with a student's common sleepiness and sleep disorders.

Correspondingly, the use of technology prior to bed has a huge impact on sleep and probably more than most students expect (Hershner, 2014). It is not uncommon to hear students going through their cellular devices or laptops for an entire hour before going to bed. Adults between the ages of 19-29 years old are known to heavily use their electronic devices before bed (Hershner, 2014). Among those that admit to using technology before bed, 51% reported not

getting a good night's sleep (Hershner, 2014). The use of technology within one hour before bedtime makes the brain feel awake and not ready to go to bed (Hershner, 2014). Table 1 summarizes the effects of technology on sleep. A solution to this problem is easily solved -- simply put all technology away before bedtime. The final hour before going to bed should be a quiet time, used to relax and prepare for sleep.

Use of cell phone in the bedroom was associated with a higher frequency of	• Daytime sleepiness • Poor quality sleep • Waking unrefreshed • More difficulties falling asleep and staying asleep • Repeated awakenings
Use of the computer before bed was associated with a higher frequency of	• Drowsy driving • Daytime sleepiness • Less restful sleep
Use of video games before bed was associated with a higher frequency of	• Increased sleep latency

Table 1: Consistent use of technology before bedtime results in difficulties in sleep. (Hershner, 2014).

Technology
TV, computer, or video games before bed
Cell phones on overnight
Frequent exposure to light before bed
Substances
Caffeine and energy drinks
Alcohol use
Stimulant use
College scheduling and activities
Variable class schedules from day to day
Late night socializing
Early or late obligations

Table 2: A summary of substances that commonly affecting students sleep hygiene (Hershner, 2014).

Furthermore, as college tuition has been increasing dramatically ost students must work while attending college in addition to their studies. Work takes time away that students could be using to study or get school work done. Most students who find themselves in this situation must cut down on hours of sleep to compensate for work and studies (Ezar, 2017). A student from Wesleyan was interviewed about his experience working and attending university; this student attend school full-time and works two on-campus jobs that he has to coordinate within his schedule (Ezar, 2017). The student only gets adequate sleep twice a week (Ezar, 2017). His main complaint is that he is sometimes so tired, he cannot pay attention in class and will miss notes (Ezar, 2017). The solution to working and attending school is not easily solvable. The most effective solution is for students to be taught to study efficiently and make a weekly schedule. Being efficient in studies will allow a student to finish more work in less time. Also, making a weekly schedule will allow students to manage their bedtime and properly coordinate the work that needs to be done within that week.

Moreover, a common tactic students use to compensate for loss of sleep throughout a school week is to catch up on sleep on the weekends. This tactic has shown to bring daytime sleepiness and inflammation levels back to normal; however, cognitive performance did not rebound (Pejovic, 2013). It is important for the student to understand they s/he cannot rely on catching up on sleep over the weekend to to restore their focus and attention (Pejovic, 2013). The only way a student can maintain their cognitive performance is to maintain adequate sleep throughout the entire week.

Lastly, the most important solution to sleep deprivation and sleep disorders is to educate students on the importance of sleep and treatment for sleep disorders. The more aware students are on the effects sleep has on their health and academic performance, the more likely students may be willing to make sleep a priority. Additionally, most sleep disorders go unrecognized and untreated in a clinical practice (Jaiswal, 2017). Physicians typically brush over sleep without asking their patients about their sleeping habits or educating their patients on the importance of sleep (Jaiswal, 2017). It is important for physicians to discuss sleep as part of an annual physical. This may encourage students/patients to honestly discuss sleeping problems, and as a result, sleep disorder could further be detected and treated. Moreover, schools and universities could also contribute to educating students about sleep. The significance of adequate sleep should be discussed at freshman orientation, emphasizing the importance of sleep to the well-being of incoming students. A flier describing the importance of sleep and a brief description of the different types of sleep disorders, including information on the resources available, such as the phone number and location of university health centers should be posted aroundcampus; this could be a helpful step toward educating students and stress the importance of healthy sleeping patterns. Professors should also intervene when a student is performing poorly in class, a quick office appointment could be very beneficial to the student.

How to Increase Quality of Sleep

The American Academy of Sleep Medicine outlines nine tips on how to get a good night's sleep ("Insomnia significantly affects"). The first tip is to follow a consistent bedtime routine ("Insomnia significantly affects"). A bedtime routine is a set pattern of activities that should be done before going to bed. These activities would include taking a shower, brushing teeth, and reading a book. Following the same bedtime routine over time subconsciously conditions the mind to prepare forsleep. The second tip is to establish a relaxing setting at bedtime ("Insomnia significantly affects"). In order to fall asleep fast, one should be in the most relaxed state. Avoiding stress on the body will allow one to fall asleep quickly and deter waking up throughout the night. The third tip is to get a full night's sleep every night ("Insomnia significantly affects"). The recommended amount of nightly sleep is between 7-9 hours, depending on the age of the individual. When one receives adequate sleep, they go through more cycles of REM sleep which will allows the body wake up refreshed. The fourth tip is to avoid caffeine prior to bedtime along with any medications that contain a stimulant ("Insomnia significantly affects"). These factors are used to keep one awake throughout the day and consuming them before bedtime will make it difficult to fall asleep. The fifth tip is to avoid stress and anxiety before bedtime("Insomnia significantly affects"). As mentioned earlier, the body should be in a relaxed state prior to bedtime in order to fall asleep fast. Worries and stress will stimulate the mind and make it difficult to fall asleep. The sixth tip is to avoid a big meal before bedtime but also not go to bed hungry. ("Insomnia significantly affects"). Both food and hunger can stimulate the body and keep it awake. One should eat a couple of hours before bedtime to

avoid hunger and to allow food to digest before bedtime. The seventh tip is to avoid any rigorous exercise within six hours of bedtime ("Insomnia significantly affects"). The body should be given those six hours after the exercise to allow the mental and physical stimulation to leave the nervous system and calm down at night (Clear). The eighth tip is to keep the bedroom quiet and dark. As discussed above, melatonin, a sleep hormone, is stimulated by darkness, and cortisol is stimulated with light (Macnow, 2016). Stimulating the production of melatonin through a dark environment results in falling asleep faster(Macnow, 2016). Finally, the ninth tip is to get up at the same time every morning ("Insomnia significantly affects"). To coordinate sleep properly, it is always best to follow the same schedule to allow the body to develop good sleep habits (clear).

It has become common for people to rely on sleeping aids to help fall asleep faster. There are several natural sleeping aids. The first of these is exercise (Clear). Exercise during the day will allow the brain to power down when it is time for bed (Clear). In addition, obesity has shown to have an effect on sleep itself and adequate exercise will avoid weight gain (Clear). Studies have shown that fit middle-aged adults generally sleep better than their overweight peers (Clear). A second natural sleep aid is temperature (Clear). People sleep best at temperatures ranging between 65 to 70 degrees fahrenheit (Clear). The third natural sleep aid, as briefly described above, is a peaceful environment (Clear). A quiet space is essential to good sleep (Clear). Some people have trouble sleeping in a completely silent room; a solution to this would be to create white noise (Clear). White noise is also known as background noise that goes unnoticed, such as a fan, air conditioning, and rain.

Conclusion

Current research has shown that fifty percent of college students report daytime sleepiness and seventy percent experience insufficient sleep (Hershner, 2014). This is a significant issue in that sleep is known to play a significant role in the development of the brain. It serves multiple purposes that are essential to the brain and body (Clear). One of these purposes is memories consolidate (McGaugh, 2012). A decrease in the inability for college student to convert short-term memory to long-term memory can have a significant effect in a student's learning process. This is one of the reasons a lack of sleep has shown a decrease in academic performance. In addition, sleep disorders have become more widespread in student (Kling, 2010). The most common sleep disorders displayed were narcolepsy and insomnia (Kling, 2010). The main issue occurred when research showed that students were unaware of their sleep disorder and were not getting treated (Jaiswal, 2017). Sleep disorder going undiagnosed could have long term effects on other parts of the body such as the nervous, endocrine, cardiovascular, respiratory system. The best solution to students experiencing sleep deprivation and sleep disorder is to educate student on the importance of sleep. Educating students will allow students to be more willing to prioritize sleep and encourage students to honestly discuss sleeping problems with a physician.

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