

SLEEP QUALITY AND ITS RELATIONSHIP ON DEPRESSION, ANXIETY AND STRESS

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Abstract

Sleep quality is defined as one's satisfaction of the sleep experience, integrating aspects of sleep initiation, sleep maintenance, sleep quantity, and refreshment upon awakening. Sleep has a bidirectional relationship to mental and emotional health. Sleep is an important physiological process for university students to maintain their productivity levels and there are frequent reports of poor sleep quality due to changing social opportunities, social relationships, and increasing academic demands. This study has been done to assess sleep quality and its impact on depression, anxiety and stress in college students. The scale used are Pittsburgh sleep quality index (PSQI) and Depression Anxiety Stress Scale (DASS) was used to collect the data from a sample population of 100 undergraduate students which includes 60 females and 40 males. The data collected was analyzed using a statistical package for social science (SPSS) to find the relationship between the variables using Pearson Correlation Coefficient. The result showed that there is a significant relationship between sleep quality and depression, anxiety and stress. The coefficient is significant at 0.01 level. Hence the poor sleep quality has been identified as an important cause for depression, anxiety, stress among individuals.

Keywords: Sleep quality, Depression, Anxiety, Stress

1. INTRODUCTION

Sleep is occurring conditions of mind and body that are characterized by altered consciousness, decreased sensory activity, decreased muscle activity, and inhibition of all voluntary muscles during rapid eye movement (REM) sleep, as well as diminished interactions with the environment. It differs from alertness in the way that it has a lower ability to react to stimuli. Humans need sleep to survive. Although the direct advantages of sleep have yet to be established across many groups, sleep deprivation is known to have substantial health implications.

In a sleep cycle, there are two forms of sleep: Rapid Eye Movement (REM) and Non-Rapid Eye Movement (NREM). There are three distinct stages of sleep during NREM sleep. The quantity of sleep a person gets throughout each of these stages varies over time, especially as they get older. Each stage of sleep, including REM, has various effects on the brain, and sleep cycles between REM and NREM sleep happen numerous times a night depending on how long one sleeps and how well that sleep is. Sleep usually starts with an NREM sleep stage, then cycles through the three NREM stages before ending with a REM period. NREM and REM sleep alternate in a cyclical pattern throughout the night, lasting about 90 minutes with REM sleep phases. During each of these phases, the brain and body behave differently (Sabrina Felson, 2020).

The term "sleep quality" refers to how well you sleep, or if a person's sleep is restful and rejuvenating. Sleep quality is defined as a person's contentment with their

sleep experience, which includes factors such as sleep initiation, sleep maintenance, sleep quantity, and wakefulness. Sleep quality is more difficult to quantify than sleep quantity, although it isn't completely subjective. Sleep quality is usually measured using four criteria:

- Sleep Latency: The length of time it takes the person to fall asleep is known as sleep latency. Sleeping off within 30 minutes or less of going to bed is found to be one of the indicators that sleep is of good quality.
- Sleep Waking: The frequency with which the person wakes up during the night is measured by sleep-waking. Frequent waking is seen as an indicator of poor sleep
- Wakefulness: The number of minutes person is awake during the night after people first go to sleep is referred to as wakefulness. The higher the time of wakefulness the poorer the sleep quality
- Sleep Efficiency: Sleep efficiency refers to the amount of time people spend sleeping when in bed. The higher the time the time the better the sleep quality

Theories of sleep:

Restorative theory: According to the restorative idea, sleep permits the body to revitalize and restore the physiological process required to rejuvenate the body and mind. Numerous biological functions, such as muscle repair, tissue growth, protein synthesis, and the release of many important growth hormones, are shown to occur largely during sleep (Wanda van Niekerk, 2020).

Adaptive theory: The adaptive hypothesis of sleep is also known as the inactivity theory or the evolutionary theory of sleep. This idea proposes that all species have evolved to sleep during times when being awake puts them in more danger, such as at night and in the dark, when predators have an edge in vision and stealth. Sleepiness, like hunger and thirst, may indicate an underlying physiological need that can only be met by sleeping and is critical to an individual's survival (Wanda van Niekerk, 2020).

Depression:

“Depression is a psychological and serious condition that has a negative impact on the perspective how person feel, think, and act” (Felix Torres, 2020). Depression produces unhappiness and a loss of interest at pleasurable activities. The symptoms are sadness or a gloomy state of mind, Appetite changes, weight loss or gain not related to dieting, sleeping problems which include either loss of sleep or sleeping too much, Increased weariness or a loss of energy, and increased involuntary physical activity or slower movements or speech, feeling unreasonable irrational guilt, Thinking, difficulty in concentrating, or making decisions and suicide or ruminative thoughts of death.

Anxiety:

“Anxiety is defined as the body's natural reactions or response to stress. It's a sense of fear or apprehension about negative consequences or outcomes of situations. A simple exam is that most people feel afraid and frightened on the first day of school, going to a job interview, or giving a speech” (Kimberly Holland, 2020). The following are the symptoms of anxiety: Feeling restless, or tense, feelings of impending danger, panic, or impending disaster, having a faster heart rate, rapid breathing, sweating, trembling, feeling fatigued or weak, having difficulty concentrating or thinking about anything other than the current concern, having difficulty sleeping, having difficulties with your gastrointestinal tract, having trouble managing your anxiety, having a strong desire to avoid situations that cause uneasiness.

Stress:

“Stress is a body reaction that requires attention and action” (Elizabeth Scott,2022). In truth, the human body is built to recognize and respond to stress. The body develops physical and mental alterations in response to changes in stress. Stress is "the

body's reaction to potentially dangerous events, whether real or imagined". The body's built-in stress reaction, known as the "fight-or-flight response," which assists it in dealing with stressful conditions. The stress response can cause elevated heart rate, a quickening of breath, muscles tightening, and an increase in blood pressure. The symptoms of stress are changes in mood, clammy or sweaty palms, decreased sex drive, diarrhea, difficulty sleeping, digestive problems, dizziness, feeling anxious, headache, low energy, frequent sickness, grinding teeth, muscle tension, trembling, racing heartbeat, physical aches, and pains.

Sleep and mental health:

Sleep is essential for maintaining excellent physical and mental health. In the short term, sleep deprivation makes you irritated and weary, but it can also have major long-term health repercussions. Sleep deprivation has been found to be one of the important causes of a range of negative health outcomes, including heart disease, type2 diabetes, and depression. At the same time, sleep disorders can be caused by psychiatric ailments, and abnormalities in sleep can increase the symptoms of many mental illnesses, including depression, anxiety, and bipolar disorder. Sleep has long been recognized as a symptom of many psychiatric disorders, newer theories imply that sleep can also play a causative role in the development and maintenance of mental illnesses (Kendra Cherry,2020).

Sleep deprivation can also become a source of stress. Sleep and stress are inextricably intertwined. Insufficient sleep can increase stress levels, while stress can negatively affect sleep quality and duration. A lack of sleep and stress can both cause long-term physical and mental health issues. The stress hormone cortisol has significant ramifications for the sleep-wake cycle. Studies have indicated that patients with insomnia had higher cortisol levels in the evening, which is associated to more midnight awakenings. Sleep deprivation can cause the body to release more cortisol, the stress hormone. Cortisol controls your fight-or-flight response to danger, raising your heart rate in preparation for a fight. However, too much cortisol can cause weight gain and cardiovascular problems over time. This happens when the body is unable to regulate its hormone levels overnight due to poor sleeping patterns.

The link between sleep and anxiety, like many other psychological problems, appears to be bidirectional. Sleep problems are more common in those with anxiety, but sleep deprivation can also contribute to anxiety symptoms. It is a vicious cycle, causing both sleep and anxiety problems in life. Sleep disturbances can be a risk factor for anxiety disorders. Sleep and psychological illnesses like anxiety is always linked. If people have an anxiety issue, falling and awakening may be difficult. However, if people have a sleep issue, people may feel worried or apprehensive before going to bed because people are concerned about not getting enough rest, because one condition frequently exacerbates the other, led to never-ending cycle.

There is a bidirectional relationship between depression and sleep problems. This indicates that poor sleep can contribute to the development of depression, and that sadness increases the likelihood of developing sleep problems. Insomnia and other sleep issues can be a sign of sadness, but recent study has linked a lack of sleep to depression itself. Changes in the action of the neurotransmitter serotonin could play a role in the development of depression. Sleep disturbances can impact the body's stress system, causing circadian rhythms to be disrupted 10 and raising the risk of depression. One of the most common symptoms of clinical depression is inability to sleep. Oversleeping or sleeping too much is another indicator of severe depression.

Christian Franceschini et al (2019), in their research, tried to study the determinant of poor sleep quality and its consequence on mental health in a sample size of

6439 people during the COVID-19 lockdown in Italy and It was found that nearly half of the Italian population has impaired sleep quality and sleep habits due to the psychological distress on COVID-19 measures.

Perna Varma et al (2021),in their study examined poor sleep quality and its relationship with individual characteristics, personal experience and mental health during the covid-19 pandemic in a sample of 1745 people from 63 countries and It was found that poor sleep quality is frequent throughout the pandemic, according to the cross sectional study done during the first wave of our worldwide, linked to a 2–3 times higher chance of experiencing state anxiety, moderate depression, and stress in the longitudinal study, compared to good sleepers.

Panel Sunah Hyunab et al (2019), investigated on psychological correlates of poor sleep quality among U.S young adults during the covid-19 pandemic using the data from the COVID-19 Adult Resilience Experiences Study (CARES) 2020 in which a sample of 908 young adults aged 18 to 30, participated in an online survey that included questions regarding their experiences with the COVID-19 epidemic, psychosocial aspects, mental health, and sleep quality and it was found that young adults have had high rates of sleep disruption during the first two months of the pandemic and 44.3 percent of them had a prior mental health diagnosis.

Sonali Tanmay Choksi et al (2020), in his study to determine the relationship between the Excessive use of mobile phone with anxiety, depression, stress, sleep quality in a sample of 100 college students of city Surat concluded that students who are addicted to mobile phones had high likelihood of experiencing anxiety, depression, stress and poor sleep quality,

Sleep is one of the important everyday cycles for human beings which is essential to maintain homeostasis. However, it can be been affected due to various reasons ranging from simple distraction to changes in lifestyles, issues associated with interpersonal relationship, excessive use of gadgets or social media, physical and mental health issues etc. Sleep deprivation and other sleep related problems seems to have increased during pandemic due to various life style changes which had to be brought about as precautionary measures and due to external control, This study has been done which the objective of understanding how sleep quality has been affected in the college students since they were subject to excessive use of gadgets, virtual systems to pursue their academic activities which in turn would have led to mental health causing or increasing the intensity of depression, anxiety, stress in them.

2. METHODOLOGY

Aim:

To find the relationship between Sleep quality and Depression, Anxiety, Stress among college students.

Hypothesis:

H1 - There is a significant relationship between Sleep quality and Depression.

H2 - There is a significant relationship between Sleep quality and Anxiety.

H3 - There is a significant relationship between Sleep quality and Stress.

Research design:

The research design is correlation research design. This particular research implies the correlation design where the researcher correlates the variables and find the relationship between the two variables. This research was conducted using a standardized

questionnaire to collect the data and the Pearson correlation coefficient was calculated using SPSS to understand the nature and significance of the relationship between the variables.

Sample technique:

The researcher adopted purposive sampling. A sample of 100, college students in the age group ranging from 18 to 25 were taken for the study. The population consisted of 60 females and 40 males. All the sample population were UG students from different colleges in Chennai. The demographic status of the population is middle-class family.

Tool description:

The Pittsburgh Sleep Quality Index (PSQI) is a one-month self-report questionnaire that evaluates sleep quality. It was developed by University of Pittsburgh, Buysse and his colleagues created the PSQI in 1988 to produce a standardized test that would gather consistent information about people's subjective sleep habits and provide a clear indicator that both physicians and patients could utilize. The test consists of 19 individual items that combine to form seven components that result in a single overall score. It takes 10 to 15 minutes to complete. The questionnaire has been used to diagnose sleep disorders in a variety of situations, including research and therapeutic activities. The PSQI has been found to be useful and valid in the assessment of sleep disorders in clinical research to some extent, although more so with self-reported sleep issues and depression-related symptoms than anti-graphic tests.

Depression anxiety stress scale:

The Depression Anxiety Stress Scales (DASS) are a set of 42 self-report items that take 15 to 20n minutes to complete. It was developed by researchers by the University of New South Wales. The scale's initial goals were to characterize the full spectrum of basic depression and anxiety symptoms, meet stringent standards of psychometric adequacy, and establish maximal discrimination between the depression anxiety scales. To emphasize states over traits, each of them is graded on a four-point Likert scale of frequency or severity of the participants' experiences over the previous week. These scores ranged from 0 to 3, with 0 indicating that the item "did not apply to them at all," and 3 indicating that the item "applied to them very much or most of the time." The instructions also emphasize that there are no right or wrong answers. Dysphonic, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement and lethargy are all assessed on the Depression scale. The Anxiety scale evaluates autonomic arousal, skeletal muscle effects, situational anxiety, and subjective anxious affect experience. The subscales of the Stress scale highlight non-chronic arousal by highlighting trouble relaxing, anxious arousal, and being quickly upset/agitated, irritable/over-reactive, and impatient.

Statistics used:

This study adopted inferential statistics. Pearson correlation coefficient was preferred because the researchers want to find the relationship between the variables and it was calculated using SPSS to find the relationship between the variables.

3. RESULTS & DISCUSSION

Table 3.1 – Indicates the relationship between Sleep quality & Depression

Variable	N	Mean	SD	r
Sleep quality	100	14.90	7.163	.573**
Depression		13.70	8.071	

** . Correlation is Significant at the 0.01level (2-tailed)

In table 3.1, it is inferred that the result is significant at 0.01level (.573**). Hence the alternative hypothesis "There is a significant relationship between sleep quality and Depression" is accepted.

Table 3.2 – Indicates the relationship between Sleep quality & Anxiety

Variable	N	Mean	SD	r
Sleep quality	100	14.90	7.163	.397**
Anxiety		12.69	6.605	

** . Correlation is Significant at the 0.01level (2-tailed)

In the table 3.2, it is inferred that the result is significant at 0.01 level (.397**). Hence the alternative hypothesis "There is a significant relationship between Sleep quality and Anxiety" is accepted

Table 3.3 – Indicates the relationship between Sleep quality & Stress

Variable	N	Mean	SD	r
Sleep quality	100	14.90	7.163	.549**
Stress		14.08	6.14	

** . Correlation is Significant at the 0.01level (2-tailed)

In the table 3.3, it is inferred that the result is significant at 0.01level (.549**). Hence the alternative hypothesis "There is a significant relationship between Sleep quality and Stress" is accepted

Sleep has a significant role in maintaining function's ability of brain especially processing information, improve memory and learning, improve attention and concentration, increase creativity, develop rational thought process etc. Nowadays sleep has been affected due to the various causes like changing patterns, social media, environment and causes psychological correlates like Depression, Anxiety, Stress. Hence this study determines the relationship between sleep quality and Depression, Anxiety and Stress among college students. This study was conducted using 100(60 females and 40males) samples. The population age ranges from 18 to 25 which only consist of UG college students of urban population and middle-class family. The tool used for data is Pittsburg sleep quality Index and Depression Anxiety Stress Scale. The data is analyzed by Statistical Package for social science (SPSS) and using Pearson correlation coefficient method.

The result showed that the correlation between the variables is significant. The Mean values of sleep score is 14.90, and Standard Deviations are 7.163 and the mean values for depression score is 13.79 with Standard Deviations 8.071. The correlation between the sleep quality and Depression r score is 0.573 which is significant 0.01 levels. Thus, the Hypothesis that "There is a significant relationship between Sleep quality and Depression" is proved.

The mean value for anxiety score is 12.69 with Standard Deviations 6.605. The correlation between the sleep quality and Depression r score is 0.397 which is significant 0.01 levels. Hence the Hypothesis "There is a significant relationship between Sleep quality and Anxiety" is accepted.

The mean values for stress is 14.08 with Standard Deviations 6.149. The correlation between sleep quality and Stress is significant r score is 0.549 which is significant 0.01 levels. Hence the hypothesis "There is a significant relationship between Sleep quality and Stress." is accepted.

The various reasons such as changing sleep patterns, social media, exam fear, environmental disturbance etc. can prevent the individual from experiencing normal sleep. Physical activity and healthy social relations have been found to improve sleep quality, while caffeine intake, stress and irregular sleep-wake patterns decreased sleep quality. The frequent self-reported cause to poor sleep experiences in university students were exposure to psychological problems, academic and relationship stress, exposure to tobacco smoke in the sleeping room, pain, having family problems, strenuous physical activity, fatigue, sadness, noise that caused by other people in the room, room scents (sweat, perfume, humidity, naphthalene, etc.), depression, anxiety, and tension. The consequences of sleep deprivation and daytime sleepiness can lead to lower grade point averages, increased risk of academic failure, compromised learning, impaired mood, and increased risk of motor vehicle accidents. In some cases, it has been found that Students get inadequate sleep because they go to bed late and wake up early to fulfill their academic and social commitments. Sleep deprivation can arise from poor sleep behaviors. There is another more factor which can cause sleep deprivation is internet and social media. This generation especially college students are more addicted to the social media and skip sleep for a long time. Most of the population uses phone and social media in the night so they skip night sleep or sleepless and they tend to sleep in the morning. Skipping sleep and disturbance in the sleep has led the individual to various factors like low concentration, feeling lazy also has mental disturbances not able to do many things which they intend to do.

Numerous studies have reported an association between insomnia and Depression, Anxiety, Stress. Indeed, patients with persistent insomnia are reportedly predisposed to developing psychiatric illness and are more prone to the recurrence of depression. Among patients with partially treated depression, residual symptoms such as anxiety and insomnia are among the most powerful predictors for relapse. Additionally, insomnia and anxiety share the path-genetic mechanism: hyper arousal caused by non-regulation of neurotransmitter systems including cholinergic and GABA- Eric mechanisms. Hyperarousal and insufficient sleep disrupt the function of cortices-limb circuitry, which leads to impaired affective reactivity and regulation. Genetic studies also showed a strong overlap between genetic influences on insomnia, depression, and anxiety, stress. This is reflected in the high relation of the two conditions of patients with anxiety report insomnia.

Practice of Sleep hygiene which encourages habits conducive to restorative sleep and avoidance of substances or behaviors that can affect sleep can help in resolving the problems associated with sleep disturbances to a very great extent. Understanding the sleep cycle of the individual, factors that significantly affect sleep and using a customized intervention model of psychological therapies can also help improving the sleep-in individuals there by alleviating the distress experienced because of it. This can also help in preventing the secondary effect on mental health issues such as anxiety, depression and stress.

4. CONCLUSION

In the study, it is resulted that 1st Hypothesis “There is a significant relationship between sleep quality and Depression” is proved. It implies that person with insomnia have high chances of Depression. Then 2nd Hypothesis “There is a significant relationship between sleep quality and Anxiety” is proved, which proves that sleep deprivation causes anxiety problems. Then the 3rd Hypothesis, “There is a significant relationship between sleep quality and Stress” is proved. Sleep deprivation can often increase more cortisol level in the person that makes more high-alert and more reaction to stress and stressful situations.

Limitations:

- The sample population was confined to the city of Chennai.
- Only self-reported measures of medical history of the participants were taken
- The premorbid conditions associated with mental health issues of the sample not taken into account

Conflict of interest:

The authors declare no conflicts of interest.

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