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IMPACT OF SLEEP DEPRIVATION ON PSYCHOLOGICAL AND COGNITIVE WELL-BEING OF ADULTS

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Abstract

Background
Sleep deprivation is a very common public health issue that has a negative impact on psychological health and cognitive function. Lack of sleep has been linked to mood problems, difficulty remembering, anxiety, nervousness, and a loss of "functioning". The purpose of this study was to evaluate the impact of sleep loss on adults' self-reported psychological and cognitive functioning.

Methodology
A descriptive cross-sectional study was done with 110 adult participants. A structured questionnaire was used to collect demographic data such as age. Participants were asked to report the frequency of sleep deprivation and its associated effects on mood swings, forgetfulness, nervousness, anxiety, and brain fog with categorical responses (Never, Rarely, Sometimes, Often, Always). Data analysis was carried out by descriptive statistics, frequencies and percentages.

Results
The total number of participants in the study was 110. The majority (72.7%) were aged 36–45 years. Most of the participants stated that they sometimes experienced mood fluctuations due to lack of sleep (72.7%), and 13.6% often and 4.5% always. Sixty-eight per cent of participants reported forgetfulness occasionally and 18.2 per cent often. 54.5% of participants reported feeling nervous occasionally; 45.5% reported anxiety occasionally. One in two (54.5%) said they

sometimes became sleep deprived and 18.2% always became sleep deprived. 45.5% of participants reported experiencing brain fog during normal daily activities sometimes.

Conclusion

Psychological and cognitive changes were frequently reported with sleep deprivation, such as moodiness, forgetfulness, nervousness, anxiety, and brain fog. These results point towards the significance of encouraging healthy sleep patterns for the betterment of mental health and cognitive function in adults.

INTRODUCTION

Sleep is a vital physiological activity that is crucial to preserving general wellbeing and cognitive performance. However, in today's fast-paced, globally linked world, sleep deprivation has become a widespread issue with significant effects on cognitive function[1]. The frequency of sleep deprivation is startling because we frequently neglect prioritizing getting enough sleep as we juggle hectic schedules, electronic distractions, and the stresses of daily life[2]. This pervasive lack of sleep has far-reaching effects that go well beyond simple exhaustion. Lack of sleep has an impact on many facets of everyday life, including interpersonal relationships, productivity, decision-making, and emotional control. Its influence permeates academic pursuits, career aspirations, and interpersonal relationships, influencing the course of people's life and society dynamics[3].

According to epidemiological data, a third of adults worldwide suffer from poor or insufficient sleep, and this number is rising due to modern lifestyle factors like longer workdays, more screen time, and elevated stress levels[4]. Rest difficulties have also been linked to several detrimental outcomes, including impaired cognitive function, a weakened resistance system, metabolic clutter, and an increased risk of psychiatric clutter[5]. There is essentially a two-way causal relationship between mental well-being and rest, with mental illnesses like discouragement and unease exacerbating rest disorders Rest and mental well-being are basically causally related in both directions, with mental diseases such as depression and anxiety aggravating rest issues[6].

Sleep quality is influenced by gender, particularly in later life. Compared to women, men often have more severe NREM sleep disturbances and impairments. Research comparing more than 2,500 older persons between the ages of 37 and 92 found this difference[7]. Reduced cognitive energy resources have been associated with sleep deprivation, which is defined as a decreased capacity to begin and sustain sleep. These tools are crucial for choosing suitable techniques for controlling emotions in difficult situations[8]. Reduced attention and psychomotor alertness, as well as increased behavioral response variability, are the most common manifestations of the general and consequences of sleep deprivation on cognition. The dorsolateral prefrontal cortex and parietal areas are linked to these effects. The biological pressure to sleep increases with the length of time a person is awake. The growing homeostatic need for sleep clashes with the person's desire to remain awake during times of deliberate wakefulness[9].

Aims of study

The purpose of this study was to evaluate the impact of sleep loss on adults' self-reported psychological and cognitive functioning.

Methodology

Study Design

This study was a descriptive cross-sectional study, whose objective was to evaluate the psychological and cognitive effects of sleep deprivation in adults. The study aimed to assess participants' self-reported experience of the effects of poor sleep on mood, memory, emotional state and cognitive function. The cross-sectional design was deemed appropriate for the purpose since it enabled an evaluation of the prevalence of health-related outcomes in a population under study at one point in time.

Study Population and Sampling

In total, there were 110 adult participants in the study. The study adopted convenience sampling techniques of which the subjects were those who are willing and available to participate in the study. Those who could understand the questions and who gave informed consent (age 20 years and over) were included. Those that filled part of the questionnaire and those who refused were excluded from this study.

Data Collection Instrument

A self-administered structured questionnaire developed to evaluate the psychological and cognitive impact of sleep deprivation was used to obtain data. The questionnaire consisted of two sections. The first section gathered data on demographic factors that included age of the participants. The second section assessed how often participants experienced symptoms of inadequate sleep, such as mood swings, forgetfulness, nervousness, anxiety, feeling sleep-deprived and brain fog throughout normal daily activities. Answer choices were Never, rarely (where applicable), Sometimes, Often, and Always and were recorded by using a Likert-type scale.

Data Collection Procedure

The participants were briefed about the aim and goal of the study prior to data collection. Those who agreed to participate provided informed consent before completing the questionnaire. The questionnaire was answered independently by the participants and had no influence from the researchers. Confidentiality and anonymity were ensured during data collection and no personally identifiable data were collected.

Outcome Measures

Self-reported psychological and cognitive changes due to sleep deprivation were the main results of the study. These were: mood swings, forgetfulness, nervousness, anxiety, sensation of sleep deprivation and mental fogginess in normal functioning. The age was listed as the demographic variable to describe the study population.

Statistical Analysis

The data collected were entered into a spreadsheet in Microsoft Excel and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM Corp., Armonk, NY, USA). The study was summarized using descriptive statistical analysis. Categorical data were reported as numbers (n) and percentages (%). The data have been presented in tables which show the age distribution of participants and the prevalence of psychological and cognitive symptoms of sleep deprivation.

Results

Table 1. Age distribution of the subjects (N = 110)

Age Group (Years)	Number of Participants (n)	Percentage (%)
20–35	20	18.2
36–45	80	72.7
46–60	8	7.3
Above 60	2	1.8
Total	110	100.0

Table 2. The methodology for self-reported psychological and cognitive effects of sleep deprivation included in the study (N = 110)

Outcome	Never n (%)	Rarely n (%)	Sometimes n (%)	Often n (%)	Always n (%)	Total
Lack of sleep leads to mood swings	10 (9.1)	–	80 (72.7)	15 (13.6)	5 (4.5)	110
Forget more easily	12 (10.9)	–	75 (68.2)	20 (18.2)	3 (2.7)	110
Feel nervous	30 (27.3)	–	60 (54.5)	10 (9.1)	10 (9.1)	110

Feel anxious	50 (45.5)	–	50 (45.5)	5 (4.5)	5 (4.5)	110
Feel sleep deprivation	11 (10.0)	9 (8.2)	60 (54.5)	10 (9.1)	20 (18.2)	110
Experience brain fog during normal activities	10 (9.1)	30 (27.3)	50 (45.5)	10 (9.1)	10 (9.1)	110

There were 110 subjects in the study. The ages of the subjects are given in Table 1. Most participants belonged to the 36–45 years age group (n = 80, 72.7%), followed by those aged 20–35 years (n = 20, 18.2%). The participants were aged between 46-60 years, (n = 8, 7.3%) and only 2 (1.8%) were above 60 years. The results of this study show that most of the study population were middle aged adults. Sleep deprivation is associated with various psychological and cognitive impairments. Psychological and cognitive impairments are associated with sleep deprivation. The participants were asked to report on the frequency of several psychological and cognitive symptoms known to be associated with a lack of sleep. One of the most frequent side effects of sleep deprivation was related to mood swings. Most of the participants (n = 80, 72.7%) indicated that mood swings sometimes occurred because of their poor sleep. In addition, 15 participants (13.6%) indicated that they often, and 5 participants (4.5%) that they always felt mood swings. 10 participants (9.1%) reported that they never had mood swings after poor sleep. The participants often complained of forgetfulness as well. A majority (n = 75, 68.2%) said that they found it easier to forget after poor sleep. 20 participants (18.2%) said that they often forget things, and 3 participants (2.7%) said they always forget. Fewer than 10% (12) participants reported that they never become forgetful. 60 people (54.5%) indicated they felt sometimes anxious after a lack of sleep. Thirty participants (27.3%) said they never felt nervous, and 10 participants (9.1%) said they felt nervous on both occasions often and always. Half of the respondents (n = 50, 45.5%) reported experiencing anxiety sometimes, and another half (45.5%) reported that they never experienced anxiety. Few participants (4.5%) said that they felt anxious often and an equal number (4.5%) said that they felt anxious always. The participants were also asked about sleep deprivation. Most (n = 60, 54.5%) indicated that they sometimes suffer from sleep deprivation. 20 (18.2%) participants reported "always", 10 (9.1%) participants reported "often", 9 (8.2%) participants reported rarely, and 11 (10.0%) participants reported "never" experiencing sleep deprivation. Another common symptom was brain fog during routine activities. 50 (45.5%) reported that it was sometimes experiencing brain fog, 30 (27.3%) rare. 10 percent of the participants reported often (9.1%) and always (9.1%) experiencing brain fog. 10 participants (9.1%) reported never experiencing brain fog. Overall, the results showed that most of the respondents were at least somewhat affected by poor sleep, with mood swings, forgetfulness, nervousness, and brain fog being the most common psychological and cognitive symptoms.

Discussion

In this research, 110 adults were tested for psychological and cognitive impact of sleep deprivation. The results suggest that poor sleep is frequently associated with psychological symptoms, cognitive issues, and mood problems. In all the measured outcomes the answer category "sometimes" was the most common, indicating that participants do not necessarily have these symptoms every day, but that poor sleeping habits have a significant impact on their functioning on a day-to-day basis. Nearly 75% of the participants reported mood swings as a psychological effect sometimes after poor sleep, which was the most common reported response. Adequate sleep is important for emotional regulation, especially rapid eye movement (REM) sleep that can help process emotional experiences[10]. A shorter sleep duration has been found to make people more reactive to emotions, and less effective at stress management. This can cause sleep-deprived people to become irritated, frustrated, and have an unstable mood, which can impact their personal and working relationships[11]. Another main conclusion of this study was forgetfulness. Over two-thirds of participants reported that they sometimes forget things more easily and about one-fifth of participants reported that they forget things often. Sleep is an important component of memory consolidation, learning and information processing. Lack of sleep interferes with the way the brain processes and stores information and memories while impairing short-term memory and focus[12]. The results indicate that poor sleep could have a detrimental impact on working ability, school productivity and decision making. Of those who responded, over half mentioned being nervous after insufficient sleep

as well. It is well established that sleep loss can lead to activation of the physiological stress pathways, resulting in higher levels of cortisol and sympathetic nervous system activity. These pathways may be hyperactive and associations with heightened nervousness, diminished emotional resilience and diminished coping skills may persist. People who regularly do not get enough sleep might then be more susceptible to psychological stress. Although anxiety was reported less frequently than other symptoms, almost half of the participants indicated that they sometimes experienced anxiety related to poor sleep. Numerous studies have shown that the relationship between sleep loss and anxiety is bidirectional. Inadequate sleep may lead to worse anxiety symptoms, and anxiety can hinder the ability to get a good night's sleep, creating a vicious cycle which can impact mental health.

The results also showed that over half of the respondents occasionally had insufficient sleep and almost a fifth had never got enough sleep. This may indicate that sleep deprivation is prevalent amongst the study population. The insufficient sleep time and poor quality of sleep can be attributed to various lifestyle changes such as increased screen time, work schedules, academic stressors, sleep disruptions, and psychosocial stress[13]. Another significant outcome of the study was brain fog. Almost half of the participants said they sometimes found it hard to concentrate and had lower mental clarity in their everyday life. Lack of sleep often contributes to "brain fog" since sleep is a mandatory part of recovering cognitive ability, attention and executive functioning. People with brain fog might have delayed responses, lower productivity, diminished problem-solving skills, and poor performance. Overall, these results are in line with the vast and growing literature, showing that sleep loss negatively impacts psychological functioning and cognitive functioning[14]. The present study was descriptive, though it had a self-report response, the trends observed highlight the value of healthy sleep habits. Public health campaigns to encourage sleep hygiene, stress management, and public awareness about the effects of chronic sleep loss could positively impact mental health, employee productivity and quality of life[15]. A larger and more diverse population and the use of validated sleep assessment tools in conjunction with objective assessments of sleep duration and quality should be included in future studies. Analytical statistical procedures can also further elucidate the links between sleep deprivation and certain psychological responses.

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