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COGNITIVE DISTORTION AND SLEEP QUALITY: CORRELATIONAL STUDY

Ms. Priyanka
211902039
Research Student
B.Sc. Clinical Psychology
Department of Clinical Psychology
SGT University, Gurugram

Abstract

Aim: The main aim of the study is to examine the correlation between cognitive distortions and sleep quality further, the aim was extended to explore the professional status (medical and non-medical) for cognitive distortion and sleep quality.
Methods: A sample of 100 adults was taken. The sample was divided into medical and non-medical groups. The sample was administered on **Cognitive Distortion Scale** (1997) by John Briere,PhD and The Pittsburgh Sleep Quality Index (PSQI) developed by Buysse, et al., in 1989. Data was analyzed under both descriptive and inference (t (Independent)-test and correlation) analysis using SPSS on both 1% and 5% level of significance.
Results: The study's findings highlight that there is significant positive correlation between cognitive distortion and sleep quality also, Comparing medical and non-medical groups, only sleep latency, Helplessness and preoccupa showed a significant difference
Conclusion: The study reveals that participants averaged 6.41 hours of sleep per night with an 84.71% sleep efficiency and a 1.55-minute sleep latency. The Sleep Efficiency Score was moderate at 0.60. Comparing medical and non-medical groups, only sleep latency, Helplessness and preoccupa showed a significant difference. Notably, cognitive distortions were correlated with sleep latency, disturbances, and medication usage.

Keywords: Sleep, Cognitive Distortion, Adult

INTRODUCTION

BACKGROUND AND MOTIVATION

Sleep is a cornerstone of human health, yet its intricate relationship with cognitive function and disorders remains a compelling area of investigation. Understanding this relationship is not merely an academic pursuit but holds profound implications for public health, clinical practice, and the well-being of individuals worldwide. Therefore, exploring the motivation and need for research in this domain is essential for advancing our knowledge and improving outcomes for those affected by cognitive disorders:

Public Health Impact:

Cognitive disorders, such as Alzheimer's disease, Parkinson's disease, and various forms of dementia, pose significant public health challenges globally. These conditions not only impair cognitive abilities but also affect daily functioning, independence, and quality of life. Given the aging population and the increasing prevalence of cognitive disorders, there is an urgent need to identify modifiable risk factors and develop effective interventions to mitigate cognitive decline and promote healthy aging.

Burden of Cognitive Disorders:

The economic and societal burden of cognitive disorders is immense, encompassing healthcare costs, caregiver burden, and lost productivity. Addressing the underlying factors contributing to cognitive decline, including sleep disturbances, has the potential to alleviate this burden by delaying disease onset, slowing progression, and improving outcomes for affected

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individuals and their families. Research into the link between sleep and cognitive disorders offers promising avenues for intervention and prevention.

Bidirectional Relationship:

The bidirectional relationship between sleep and cognitive function underscores the importance of investigating this link comprehensively. Disrupted sleep patterns can exacerbate cognitive impairments, while cognitive decline itself can disrupt sleep architecture and exacerbate sleep disorders. By unraveling the mechanisms underlying this interplay, researchers can identify novel therapeutic targets and develop personalized interventions to improve both sleep quality and cognitive outcomes.

Early Detection and Intervention:

Sleep disturbances often precede the onset of cognitive symptoms in neurodegenerative diseases, offering a potential window for early detection and intervention. Identifying biomarkers and predictive indicators linking sleep abnormalities to subsequent cognitive decline could facilitate targeted screening and preventive strategies. Furthermore, early interventions targeting sleep disturbances may delay or mitigate cognitive decline, offering hope for preserving cognitive health in at-risk individuals.

Everyone needs sleep to maintain their overall wellness and health because it gives the body and mind time to relax, recover, and regenerate. Important bodily processes like memory consolidation, hormone regulation, metabolic health, tissue healing, and immune system stimulation happen while you sleep. Lack of sleep can have negative effects on emotions, cognitive performance, and physical health, depression, anxiety, poor academic performance, and burnout. A continuous lack of sleep has also been connected to a number of health issues, such as heart disease, obesity, and reduced lifespans. As a result, sleep is necessary for everyone to preserve excellent health and perform at their best.

SLEEP

Sleep is a natural recurring state of the body and mind where there is reduced consciousness, sensory activity, and voluntary movement. It is an essential component of human life, allowing the body to rest and repair. Sleep is a comprehensive biological process that helps human process new information, maintain their health, and de-stress. After a long day of work, our brains need to rest to become active again. People who don't get enough sleep have increased irritation, anger, and lethargy, which is negatively affecting their daily routine and making it difficult for them to concentrate on one task at a time. Sleep quality refers to how well an individual sleeps and the extent to which they feel rested upon waking up. It involves the duration, continuity, and depth of sleep as well as the maintaining optimal health as it allows the body to recharge, repair and rejuvenate. Medical students require adequate sleep to maintain good cognitive function, memory consolidation, and mood regulation, which helps them achieve academic success.

Basically, Sleep is a complex physiological process that is essential for maintaining optimal health and cognitive function. It involves periodic cycles of distinct stages characterized by changes in brain activity, hormone levels, and physiological functions. While the exact purpose of sleep remains a subject of ongoing research, numerous studies have highlighted its crucial role in various aspects of physical and mental well-being.One of the fundamental functions of sleep is restoration and repair. During sleep, the body undergoes essential processes that promote tissue repair, muscle growth, and immune function. For example, growth hormone secretion is highest during deep sleep stages, facilitating tissue repair and growth. Additionally, the immune system becomes more active during sleep, helping to fight off infections and maintain overall health (Besedovsky et al., 2019).

Moreover, sleep plays a crucial role in memory consolidation and learning. Research suggests that different stages of sleep are involved in different aspects of memory processing. Rapid Eye Movement (REM) sleep, for instance, is associated with the consolidation of procedural and emotional memories, while slow-wave sleep (SWS) is important for declarative memory consolidation (Diekelmann& Born, 2010). These findings underscore the importance of sufficient sleep for optimal cognitive function and academic performance sleep is intricately linked to mental health and emotional well-being. Chronic sleep deprivation has been associated with an increased risk of developing mood disorders such as depression and anxiety. Sleep disturbances can disrupt emotional regulation processes, leading to heightened emotional reactivity and decreased resilience to stress (Walker, 2017). Conversely, improving sleep quality has been shown to have therapeutic effects on mood disorders, highlighting the bidirectional relationship between sleep and mental health.

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The regulation of sleep-wake cycles is primarily governed by the circadian rhythm, a biological clock synchronized to the 24-hour day-night cycle. The suprachiasmatic nucleus (SCN) in the hypothalamus acts as the master pacemaker, coordinating various physiological and behavioral processes to align with environmental light-dark cycles (Saper et al., 2005). Disruptions to the circadian rhythm, such as those caused by shift work or jet lag, can lead to sleep disturbances and adverse health outcomes.In modern society, however, many individuals experience chronic sleep deprivation due to lifestyle factors such as demanding work schedules, excessive screen time, and social obligations. The widespread use of electronic devices emitting blue light, particularly in the evening, can interfere with the body's natural sleep-wake cycle by suppressing the production of melatonin, a hormone that regulates sleep (Chang et al., 2015). As a result, sleep disorders such as insomnia and sleep apnea have become increasingly prevalent, posing significant public health challenges and addressing the importance of sleep hygiene and promoting healthy sleep habits is crucial for mitigating the negative consequences of sleep deprivation. Strategies such as maintaining a consistent sleep schedule, creating a conducive sleep environment, and limiting caffeine and alcohol consumption before bedtime can help improve sleep quality (Grandner, 2019). Additionally, cognitive-behavioral therapy for insomnia (CBT-I) has been shown to be highly effective in treating chronic insomnia and improving sleep outcomes (Irwin et al., 2016).

How much sleep do I need?

Sleep is variable from person to person. The way that people sleep and how much they need can vary widely. The number of hours of sleep that are good for your health can also change during your lifetime.

In general, recommended sleep amounts by age are:

Age	Amount of sleep needed
Newborns (birth to 3 months).	Between 14 and 17 hours.
Infants (4 months to 12 months).	Between 12 and 16 hours (including naptime).
Young children (ages 1 to 5).	Between 10 and 14 hours (including naptime).
School-aged children (ages 6 to 12).	Nine to 12 hours.
Teenagers (ages 13 to 18).	Eight to 10 hours.
Adults (18 and older).	Seven to nine hours.

These sleep amounts apply to most people, but they aren't universal. Some people need more sleep, and others need less. Variations in how much sleep you need may even be genetic. For example, some people can inherit the trait of being a "short sleeper" from a parent.

Stages of sleep:

Sleeping doesn't mean your brain is totally inactive. While you're less aware of the world around you, you still have plenty of detectable brain activity. That brain activity has predictable patterns. Experts organized those patterns into stages. The stages fall broadly into two categories: rapid eye movement (REM) sleep and non-REM (NREM) sleep.

There are three NREM stages. When you fall asleep, you typically enter NREM stage 1 and then cycle between NREM stages 2 and 3. After that, you go into REM sleep and start dreaming. After the first REM cycle, you start a new sleep cycle and go back into stage 1 or 2, and the cycle starts over.

One cycle normally takes about 90 to 120 minutes before another begins. Most people go through four or five cycles per night (assuming they get a full eight hours of sleep).

Stage 1 NREM sleep:

Stage 1 NREM sleep is the lightest stage of sleep. You enter stage 1 right after you fall asleep. This stage usually lasts only a few minutes, making up about 5% of your sleep time. After that, your sleep gets deeper, and you move into stage 2 NREM sleep.

Stage 2 NREM sleep:

Stage 2 is still light sleep, but deeper than stage 1. During this stage, your brain waves slow down and have noticeable pauses between short, powerful bursts of electrical activity. Experts think those bursts are your brain organizing memories and information from the time you spent awake.

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Stage 2 NREM sleep accounts for about 45% of your time asleep (the most of any stage). You'll go through multiple rounds of stage 2 NREM sleep, and usually, each one is longer than the last. After stage 2, you move deeper into stage 3 NREM sleep or enter REM sleep.

Stage 3 NREM sleep:

The deepest stage of NREM sleep is stage 3. It makes up about 25% of your total sleep time in adults. But babies and children need more stage 3 sleep, and the older you get, the less you need.

In stage 3, your brain waves are slow but strong. Your body takes advantage of this very deep sleep stage to repair injuries and reinforce your immune system. The same bursts of brain activity that happen in stage 2 can also happen in stage 3, and brain waves specific to stage 3 help regulate those bursts.

You need stage 3 NREM sleep to wake up feeling rested. Without enough stage 3 sleep, you feel tired and drained even if you slept for a long time. That's why your body automatically tries to get as much stage 3 sleep into your sleeping period as early as possible. After stage 3 NREM sleep, your body moves into stage 2 NREM, which is the gatekeeper of REM sleep.

Because stage 3 NREM sleep is so deep, it's hard to wake someone up from it. If they do wake up, they'll probably have "sleep inertia," a state of confusion or "mental fog." Sleep inertia lasts about 30 minutes.

On the basis of stages of sleep there are 2 types of sleep:

Types of sleep

Non-rapid eye movement(NREM)

The non-rapid eye movement (NREM) sleep phase is defined by the absence of fast eye movements. It includes three stages: N1, N2, and N3. During NREM sleep, the body goes through healing processes like tissue repair, growth, and energy conservation. This phase usually begins REM sleep and lasts the majority of the sleep cycle.

Rapid-eye movement(REM)

Rapid eye movement (REM) sleep is defined by increased brain activity, vivid dreams, and fast eye movements. It is frequently linked to the processing of emotions and the storage of memories. The majority of dreaming happens during REM sleep, which happens several times during a typical sleep cycle.

Factors affecting sleep quality

Sleep quality is influenced by various factors, including biological, environmental, and behavioral components. Understanding these factors is crucial for promoting optimal sleep hygiene and improving overall well-being. Here, we explore key determinants of sleep quality and their impact on individuals' ability to achieve restorative and refreshing sleep.

Biological factors play a significant role in regulating sleep quality. The circadian rhythm, controlled by the body's internal clock located in the suprachiasmatic nucleus of the hypothalamus, dictates the timing of sleep and wakefulness. Disruptions to this circadian rhythm, such as irregular sleep-wake schedules or exposure to artificial light at night, can impair sleep quality (Roenneberg& Merrow, 2016). Additionally, genetic variations in circadian clock genes have been associated with differences in sleep patterns and susceptibility to sleep disorders (Jones et al., 2019).

Another biological factor influencing sleep quality is age. As individuals age, changes in sleep architecture, such as a reduction in slow-wave sleep and REM sleep, can lead to poorer sleep quality and increased susceptibility to sleep disturbances (Ohayon et al., 2004). Hormonal changes, such as those associated with menopause in women, can also contribute to sleep difficulties and alterations in sleep quality (Kravitz et al., 2003).

Environmental factors can have a significant impact on sleep quality. Noise pollution, for example, can disrupt sleep by increasing arousal levels and interrupting sleep continuity (Basner et al., 2014). Similarly, exposure to excessive light, particularly blue light emitted by electronic devices, can suppress melatonin production and delay the onset of sleep (Chang et al., 2015). Creating a conducive sleep environment by minimizing noise and light can help improve sleep quality.

Behavioral factors, including lifestyle habits and sleep practices, also influence sleep quality. Irregular sleep schedules, such as those resulting from shift work or social jet lag, can disrupt the body's natural circadian rhythm and lead to sleep difficulties (Wright et al., 2013). Poor sleep hygiene practices, such as consuming caffeine or engaging in stimulating activities close to bedtime, can impair sleep quality by interfering with the ability to fall asleep and stay asleep (Grandner et al., 2006).

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Psychological factors, such as stress and anxiety, can also affect sleep quality. Chronic stress activates the body's physiological stress response, leading to heightened arousal levels and difficulties in initiating and maintaining sleep (Kalmbach et al., 2018). Similarly, individuals with anxiety disorders may experience excessive worrying and rumination, which can interfere with relaxation and sleep onset (Alvaro et al., 2013).

Medical conditions and medications can contribute to sleep disturbances and impair sleep quality. Chronic pain conditions, such as arthritis or fibromyalgia, can disrupt sleep by causing discomfort and reducing sleep continuity (Smith &Haythornthwaite, 2004). Certain medications, including antidepressants, antihypertensives, and stimulants, may have side effects that affect sleep architecture and contribute to sleep disturbances (Baldwin et al., 2017).

COGNITION

Cognition refers to the mental processes involved in acquiring, processing, storing, and using information. It encompasses a wide range of activities, including perception, attention, memory, language, reasoning, and problem-solving. One influential definition comes from Ulric Neisser, who described cognition as "all the processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used" (Neisser, 1967). Another perspective is provided by Matlin (1998), who defines cognition as "the mental processes involved in perception, attention, memory, language, problem-solving, reasoning, and decision making." These definitions illustrate the multifaceted nature of cognition and its importance in understanding human behavior.

What are cognitive distortions :

According to the American Psychological Association, a cognitive distortion is an inaccurate way of thinking. This is a fairly typical mental process that occurs in all people to varying degrees.The brain creates these mental filters as shortcuts to reduce the burden of processing lots of information at once. However, this can cause oversimplifications of complex thoughts, which can make a person feel badly about themselves.

According to a 2021 studyTrusted Source, cognitive distortions can contribute to the development and worsening of mental health conditions such as depression. Learning to identify cognitive distortions can help a person reframe their thinking and improve their mood.

By understanding the structure of cognitive distortions, a person can better identify them in their thought patterns. In the 1960s and 1970s, Aaron Beck and others conducted research that led to the creation of the common therapy method cognitive behavioral therapy (CBT) and determined that at least 10 typesTrusted Source of cognitive distortions exist. Understanding these types is essential to the success of CBT.

Types of cognitive distortions are:

Labeling: This is a reaction in which someone classifies themselves in an entirely negative way, sometimes but not always in the aftermath of an unsuccessful life event. For example, they reduce themselves to a “failure” after getting a rejection from a job application.

Discounting the positive: A person will discount and reduce any positive event in their life, chalking it up to luck or labeling it unimportant.

Mental filtering: This is a thought pattern that lingers and focuses on negative events or thoughts, even in the face of contradictory information.

Emotional reasoning: A person with emotional reasoning will allow their emotions to dictate what they believe as truth, without paying attention to the facts in front of them.

Mindreading: This cognitive distortion leads people to assume that other people have negative thoughts about them, even though they may not.

Catastrophizing: A person who catastrophizes will dread the future, predicting negative outcomes despite having no evidence to suggest that those outcomes are possible or likely.

Overgeneralizing: This distortion involves assuming that one negative event means all future events will have negative outcomes.

Personalization: A person with this distortion believes that all negative events are their fault in some way.

“Should” statements: A person may always think that they could have or must have done things in a particular way in the past, even though they did not have all the information to know how to act.

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All-or-nothing thinking: This involves viewing everything as black and white or either-or, without considering the details of a situation.

Cognitive Theory and Distortions

Cognitive theory is comprised of four parts: schemata, cognitive errors, thecognitive triad, and automatic thoughts (Beck, 1967; Black & Pössel, 2015). Thecognitive model focuses on errors in thinking, which lead to negative beliefs about the. self, world, and the future (cognitive triad); (Lorenzo-Luaces, German, &DeRubeis, COGNITIVE DISTORTIONS, SELF-COMPASSION, INSOMNIA 92015). Beck stated that cognitive biases and maladaptive cognitive content are a result oftriggering cognitive schemas, which usually are created in early life (Lorenzo-Luaces et al., 2016). The idea of these schemas developed when Beck was studying behavioralphenomena in those with depression. This research led to his hypothesis that a keyfeature of depression was when an individual initiated "certain basic cognitive patterns,"also known as schemas (Beck, 1967, p. 255).

Schemas are described as rules that outline the way an individual interprets life experiences, which includes memories related to his or her experience (Worsfold, 2009). When an individual encounters a particular environment, a schema relating to the experience is constructed. Because of this, the content of schemas reflects the values, conceptions, attitudes, and goals a person has obtained (Beck, 1967; Worsfold, 2009). For these global outlooks that have been acquired, the term dysfunctional assumption is commonly used to address the problematic features of these mindsets (Worsfold, 2009). Further, schemas can be inflexible at times, while consisting of maladaptive information about one's experiences (Black &Pössel, 2015).

While studying depression, Beck also discovered that individuals display errors in thinking that become part of the outline of their schema and are unfair to themselves. For example, one error in thinking could be an inclination to overgeneralize or to make conclusions about themselves from one encounter or event (Beck, 1967; Worsfold, 2009).

In addition to this, the cognitive triad develops in the form of what are called negative automatic thoughts, leading to the maintenance of this distorted thinking rooted in an individual's schema (Worsfold, 2009). The negative thoughts are considered digressions from rational ways of thinking that expose the personal meaning of a particular situations.

Causes and Triggers

Cognitive distortions can be an expression of a person's preexisting internal biases. These negatively skewed thoughts are likely to increaseTrusted Source a person's likelihood of depression and lead to negative behavioral responses.

Researchers theorize thatTrusted Source times of high stress, such as traumatic life events or challenges during childhood, can activate cognitive distortion. This may happen as a survival and evolutionary adaptation to streamline the thinking process.

However, this activation can continue into later life and affect events that are not necessarily negative, causing the person to view those neutral events negatively.

Effects of Poor Sleep on Cognitive Distortions:

Cognitive Rigidity: Sleep disturbances, such as insomnia, have been associated with cognitive rigidity, where individuals exhibit inflexible thinking patterns and struggle to adapt to new information (Stoffers et al., 2014). This rigidity can exacerbate cognitive distortions, such as black-and-white thinking or catastrophizing.

Negative Bias: Sleep deprivation can lead to a negative bias in information processing, making individuals more prone to interpreting ambiguous stimuli in a negative manner (Goldstein & Walker, 2014). This bias can amplify cognitive distortions related to magnification of negative events or minimizing positive ones.

Emotional Regulation: Poor sleep quality impairs emotional regulation, making individuals more susceptible to experiencing intense negative emotions (Walker, 2009). This heightened emotional reactivity can contribute to the amplification of cognitive distortions, particularly those related to emotional reasoning or overgeneralization.

Attentional Biases: Sleep disturbances disrupt attentional processes, leading to difficulties in focusing on relevant information and ignoring distractions (Altena et al., 2008). This attentional bias can contribute to cognitive distortions such as selective abstraction or jumping to conclusions.

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Impact of Cognitive Distortions on Sleep Quality:

Rumination: Cognitive distortions, such as rumination or worry, can contribute to sleep disturbances by prolonging sleep onset and increasing wakefulness during the night (Papadimitriou &Linkowski, 2005). Rumination prolongs the activation of stress-related neural circuits, making it difficult for individuals to relax and fall asleep.

Hyperarousal: Cognitive distortions associated with hypervigilance or catastrophic thinking can contribute to a state of hyperarousal, making it challenging for individuals to achieve deep, restorative sleep (Harvey, 2002). Persistent worrying about potential negative outcomes can keep the mind in a state of alertness, preventing relaxation.

Dream Disturbances: Cognitive distortions may manifest in dreams, leading to disruptive or unpleasant dream content (Lancee et al., 2010). Dream disturbances can contribute to sleep fragmentation and decreased sleep quality, perpetuating a cycle of cognitive distortions and poor sleep.

Sleep-Related Anxiety: Cognitive distortions related to sleep, such as sleep-related anxiety or preoccupation with sleep quality, can exacerbate insomnia symptoms (Morin et al., 2003). Heightened arousal about the consequences of poor sleep can further disrupt sleep continuity and quality.

Underlying Mechanisms:

Neurobiological Factors: Both sleep quality and cognitive distortions are influenced by neurobiological mechanisms involving neurotransmitters (e.g., serotonin, dopamine) and brain regions implicated in emotion regulation and cognitive control (Walker & van der Helm, 2009). Disruptions in these systems can contribute to the bidirectional relationship between sleep disturbances and cognitive distortions.

Stress Response: Chronic stress, often associated with cognitive distortions and poor sleep, dysregulates the hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system, leading to increased arousal and cognitive rigidity (McEwen, 2007). This heightened stress response contributes to the maintenance of both cognitive distortions and sleep disturbances.

Cognitive-Behavioral Factors: Cognitive-behavioral processes, such as maladaptive coping strategies or dysfunctional beliefs about sleep, mediate the relationship between sleep quality and cognitive distortions (Harvey, 2008). Interventions targeting these cognitive-behavioral factors have shown promise in improving both sleep quality and cognitive functioning (Manber et al., 2016).

REVIEW OF LITERATURE

The present research aimed to correlation of cognitive distortion and quality of sleep. A literature was searched on the Scopus, Web of Science and Google Scholar from 1981 up to 2023. The search strategy used the free text, including the keywords “cognitive distortion”, and “sleep”, a based on titles and abstracts the full text of the articles was studied. Review of collected literature is described under following Captions –

Lefebvre etal. (1981) conducted a study on cognitive distortion tendencies in depressed psychiatric patients, depressed low back pain (LBP) patients, nondepressed LBP patients, and nondepressed individuals without LBP”. Using two cognitive error questionnaires, one focusing on general life experiences and another on LBP-related experiences, the study measured general cognitive distortion and four dysphoric cognitive errors (catastrophizing, overgeneralization, personalization, and selective abstraction). Results showed significantly higher endorsement of all cognitive errors by depressed individuals, regardless of LBP presence. Depressed LBP patients exhibited stronger endorsement of LBP-related cognitive errors compared to depressed non-LBP individuals. The findings suggest that depression in LBP patients relates to both pain and cognitive errors, highlighting the potential efficacy of cognitive therapy in alleviating depression despite ongoing pain.

Morin etal. (1993) conducted a comparative study on examining the beliefs and attitudes about sleepin 145 older adults, comprising 74 participants with chronic insomnia and 71 self-identified good sleepers. Participants were asked to rate their agreement or disagreement with 28 statements related to various beliefs, expectations, and attributions about sleep. The study's results revealed significant differences between individuals with chronic insomnia and good sleepers regarding their beliefs and attitudes about sleep. Participants with chronic insomnia exhibited stronger beliefs about the negative effects of insomnia, expressing feelings of hopelessness about their ability to control their sleep and a sense of helplessness regarding the unpredictability of their sleep patterns. These findings suggest that certain beliefs and attitudes about sleep may

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contribute to the persistence of insomnia among older adults. The study underscores the importance of addressing and potentially modifying these beliefs and attitudes as part of interventions aimed at managing insomnia in this demographic.

Pilcher, J.J., Ginter, D.R., &Sadowsky, B. (1997) conducted a study on "Sleep quality versus sleep quantity: relationships between sleep and measures of health, wellbeing and sleepiness in college students." The methodology involved conducting t studies where subjects completed a 7-day sleep log followed by surveys on health well-being, and sleepiness. Study 1 included volunteers solicited from an upper division psychology class at a midwestern university. Of the 45 students enrolled i the class, 39 (28 females, 11 males) volunteered to take part in the study. Thirty o these volunteers (22 females, 8 males) completed the experiment. The mean age the subjects was 20.9 years (SD=0.98). Study 2 included volunteers from two gene introductory psychology courses. None of the subjects from study 1 were permitte to participate in study 2. Of the 279 students enrolled in both courses, 99 (69 females, 30 males) volunteered to take part in the study. Of these volunteers, 87 (62 females, 25 males) completed the study. The mean age of these subjects was 18.9 (so=1.1). The results suggested that sleep quality is more strongly relate to health, wellbeing, and sleepiness compared to sleep quantity. Healthcare professionals should focus on both sleep quality and sleep quantity to understand the role of sleep-in daily life.

Harvey's (2002) conducted study on "A cognitive model of insomnia," published in Behaviour Research and Therapy, the author presents a comprehensive theoretical framework elucidating the intricate relationship between sleep quality and cognitive distortion. The model highlights the pivotal role of dysfunctional beliefs and attitudes concerning sleep in perpetuating insomnia. According to Harvey's model, individuals struggling with insomnia often engage in maladaptive cognitive processes, such as excessive worry about sleep, which further exacerbates their sleep difficulties. Understanding Harvey's cognitive model of insomnia is paramount for gaining insight into how cognitive distortions contribute to disturbances in sleep patterns and vice versa.

Smith et al.(2004)conducted study on “relationship between sleep disturbance and chronic pain.” Through an analysis of longitudinal and cognitive-behavioral clinical trials literature, the authors explore the bidirectional nature of this connection. They emphasize the potential for cognitive-behavioral interventions aimed at improving sleep to also positively impact pain outcomes, and vice versa. By dissecting the interplay between sleep quality, pain perception, and cognitive processes, Smith and Haythornthwaite underscore the importance of integrated treatment approaches. Their insights underscore the necessity of considering both sleep disturbances and chronic pain concurrently in therapeutic strategies, recognizing the complex dynamics at play within these interconnected domains.

Morin et al.(2007) conducted a study on “Dysfunctional Beliefs and Attitudes about Sleep (DBAS) scale” and specifically presented a brief version known as DBAS-16, aiming to provide a validated tool for assessing maladaptive cognitive processes associated with sleep. This scale was meticulously designed to evaluate beliefs and attitudes potentially contributing to insomnia and other sleep disturbances. The DBAS-16 serves as a streamlined measure facilitating the identification of cognitive distortions among individuals grappling with sleep difficulties. By offering a concise and validated instrument, clinicians and researchers are empowered to more effectively pinpoint and address dysfunctional beliefs and attitudes about sleep. Consequently, this advancement informs targeted interventions tailored to alleviate maladaptive sleep-related cognitions, thus enhancing the overall management of sleep disturbances and related conditions.

Lindblomn etal. (2008) conducted study on "A bidirectional relationship between anxiety and depression, and insomnia” A prospective study in the general population," published in the Journal of Psychosomatic Research, Jansson-Fröjmark and Lindblom delve into the complex interplay among anxiety, depression, and insomnia within the general population. Through a longitudinal investigation, the authors unveil compelling evidence for a reciprocal association between psychological distress and sleep disturbances. Their findings underscore the pivotal role of cognitive processes in perpetuating this bidirectional relationship. Understanding how cognitive distortions contribute to the co-occurrence of anxiety, depression, and insomnia is crucial for the development of integrated treatment approaches aimed at addressing both mental health and sleep outcomes.

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Walker (2009) explores the "pivotal role of sleep in cognition and emotion" in his review published in the Annals of the New York Academy of Sciences. Emphasizing the bidirectional relationship between sleep quality and cognitive functioning, Walker delineates how sleep disturbances disrupt neural processes critical for memory consolidation, emotional regulation, and decision-making. These disruptions, in turn, contribute to cognitive distortions and mood disturbances. Walker's synthesis of research findings underscores the importance of understanding the impact of sleep on cognitive and emotional processes for optimizing mental well-being.

McNamara, et al. (2010)conducted study on "REM sleep plays a role in some key aspects of cognitive dysfunction in anxious depression". These aspects include how people view themselves negatively, how they remember things in a biased way, and whether their dreams are unpleasant.

McNamara et al.(2010) conducted study on "Impact of REM sleep on distortions of self-concept, mood and memory in depressed/anxious participants", In the study, 35 healthy college students and 20 depressed/anxious students were awakened during REM and NREM sleep episodes after a habituation night in a sleep lab. Self-appraisals for the depressed/anxious group were notably less positive and more negative following REM sleep awakenings compared to NREM sleep. Only the depressed/anxious subjects reported negative self-appraisal of REM sleep dreams. Both groups recalled negative memories more frequently after REM awakenings. Additionally, for depressed/anxious participants, REM dreams exhibited higher frequencies of negative emotions, aggression, and victimization compared to NREM dreams.

Barnes et al. (2011) This research draws from the Ego Depletion model and sleep physiology to predict a "link between insufficient sleep and unethical behavior." Laboratory experiments revealed that more sleep correlates with higher self-control resources and less unethical conduct. In a cross-sectional field study across various work environments, both inadequate sleep quantity and poor perceived sleep quality were associated with increased unethical behavior, as evaluated by supervisors. Cognitive fatigue was identified as a mediator between sleep quantity and unethical behavior. An experience sampling study further supported these findings within individuals. This research sheds light on the importance of considering sleep deprivation in understanding unethical behavior within organizational contexts.

Yu et al.(2012) conducted a study on" relationship between dream experiences and body posture during sleep "was examined this study involving 670 participants, , considering Big Five personality dimensions and repressive defensiveness. Participants completed measures including the Dream Intensity Scale, Dream Motif Scale, NEO Five-Factor Inventory, and Marlowe-Crowne Social Desirability Scale. Findings suggest that sleeping in the prone position may enhance dreams related to sexual, erotomaniac, and persecutory themes, such as fantasies involving celebrities, suffocation, confinement, and immobilization. These dream patterns are not fully explained by personality traits, which show only weak associations with sleep position.

Milligan etal. (2013) this study on "cognitive distortions mediate the relationship between maladaptive schema and hopelessness". It may present findings indicating that cognitive distortions serve as a mediator between EMS and hopelessness, suggesting that the way individuals perceive and interpret their experiences (cognitive distortions) plays a role in their development of hopelessness, particularly in the context of early maladaptive beliefs and patterns. This research could have implications for understanding and potentially intervening in cognitive processes related to psychological distress and hopelessness.

Fernández-Mendoza etal.(2013) provide a study on "comprehensive examination of the repercussions of insomnia on both physical and mental health", as documented in their study published in Current Psychiatry Reports. Through their review, they highlight the significant impact of sleep disturbances, particularly insomnia, on various facets of health, including cognitive functioning, mood stability, and cardiovascular wellness. The authors emphasize the bidirectional nature of the relationship between insomnia and mental health, shedding light on how these intertwined factors exacerbate one another.

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Their findings underscore the importance of developing integrated interventions that address not only sleep disturbances but also their associated health comorbidities. By elucidating the underlying mechanisms linking insomnia to adverse health outcomes, Fernández-Mendoza and Vgontzas contribute valuable insights to inform both clinical practice and public health initiatives aimed at promoting sleep health and overall well-being.

Buysse's (2014) conducted a study on "Sleep health: can we define it? Does it matter?" published in Sleep, the author delves into the intricate concept of sleep health and its significance for overall well-being. Through a comprehensive analysis of different facets of sleep, such as duration, quality, and timing, Buysse underscores the multifaceted nature of sleep health. By elucidating these dimensions, the paper emphasizes the critical importance of understanding sleep health in its entirety. Buysse argues that this holistic understanding is essential for accurately assessing the impact of sleep disturbances on cognitive functioning and mental health outcomes.

Yaffe etal. (2014) conducted a study on "Sleep issues and cognitive decline are common in older adults", with emerging links between them. Observational studies suggest that sleep problems like inadequate duration and fragmentation correlate with cognitive impairment, while evidence on insomnia and circadian rhythm issues is less consistent. Understanding the relationship between sleep and cognition offers a potential avenue for improving cognitive outcomes in those at risk of dementia. Though the biological mechanisms are not fully understood, further research in this area may help identify at-risk individuals and develop new therapies for both sleep problems and cognitive decline.

Poletti, Colombo, and Benedetti, (2014) conducted a study onCognitive distortion is a central feature of depression, encompassing negative thinking, dysfunctional personality styles and dysfunctional attitudes". It has been hypothesized that ACEs could increase the vulnerability to depression by contributing to the development of a stable negative cognitive style. Nevertheless, little research has been carried out on possible associations between adverse childhood experiences (ACEs) and cognitive distortion, and whether any gender differences exist.

Reeve etal. (2015) A systematic search was conducted to locate studies examining the "relationship between sleep and psychotic experiences in both clinical and non-clinical populations". From this search, 66 papers were identified. The literature strongly indicates a connection between sleep dysfunction and psychotic experiences, particularly linking insomnia with paranoia. Various methodologies, including epidemiological surveys, studies on the transition to psychosis, and investigations into relapse, support the notion of sleep dysfunction preceding psychotic experiences. Additionally, experiments demonstrate that reducing sleep can induce psychotic experiences in non-clinical individuals, while improving sleep in those with psychosis may mitigate such experiences. Anxiety and depression consistently emerge as potential mediators of the relationship between sleep and psychosis.

Basha et al. (2015) investigated the cross-sectional study on "relationships among rumination, cognitive distortions, anxiety, and depression in university students". The study, involving 270 Egyptian students, utilized measures such as the Rumination Response Scale and Beck Depression Inventory (BDI-II) to assess these variables. Significant gender differences were found, with females scoring higher on rumination and anxiety measures. However, there were no gender disparities in depression or cognitive distortions. Positive correlations were observed between rumination, cognitive distortions, anxiety, and depression symptoms in both genders, particularly highlighting the link between exaggeration and anxiety/depression symptoms among females. Additionally, the study identified rumination and failure generalization as significant predictors of anxiety and depression across both male and female participants. These findings underscore the importance of addressing rumination and cognitive distortions in managing anxiety and depression symptoms among university students.

Kaplan et al. (2017) conducted study focused on evaluating the "reliability and validity of the Cognitive Distortions Questionnaire (CD-Quest) in English-speaking adults diagnosed with social anxiety disorder (SAD)". The CD-Quest, comprising 15 items, targets the frequency and intensity of cognitive distortions. Participants recruited for the study were

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adults actively seeking treatment for social anxiety disorder. Methodologically, the researchers assessed the CD-Quest's reliability and validity, including its convergent validity (by correlating it with other measures of cognitive distortions), discriminate validity (by discerning differences between individuals with and without SAD), and treatment sensitivity. Results indicated promising outcomes: the CD-Quest displayed robust reliability and validity metrics. It exhibited significant correlations with established measures of cognitive distortions, showcasing good convergent validity. Moreover, clear distinctions were observed between individuals with SAD and those without, suggesting strong discriminate validity. Additionally, the CD-Quest demonstrated sensitivity to changes over the treatment period, implying its effectiveness in tracking therapeutic progress. In summary, Kaplan et al.'s findings underscored the CD-Quest's utility as a dependable tool for assessing cognitive distortions in English-speaking adults grappling with social anxiety disorder, thereby enhancing its applicability in clinical contexts.

Kalmbach et al. (2018) conducted study on “genetic contributions to sleep disturbance and disparities in depression in their study published in Sleep”. Employing a genome-wide association approach, the research investigates the genetic overlap between these two conditions in a diverse sample. The findings unveil genetic factors associated with both sleep disturbances and depression while underscoring disparities in the genetic architecture of sleep disturbances across various racial/ethnic groups. This understanding of the genetic underpinnings informs precision medicine strategies that consider individual differences in susceptibility and treatment response, thereby enhancing mental health outcomes and mitigating health disparities.

Kumar et al. (2019) conducted study on “cognitive distortions among individuals with insomnia disorder”. Their synthesis of evidence from observational studies and clinical trials illuminates prevalent maladaptive thought patterns associated with insomnia. By shedding light on the cognitive processes underlying sleep disturbances, the review informs targeted interventions aimed at addressing dysfunctional beliefs and attitudes about sleep, thereby enhancing treatment outcomes. Their work underscores the importance of understanding cognitive distortions in insomnia disorder for refining clinical approaches focused on promoting adaptive cognitive functioning and sleep health.

Stanziano et al. (2019) conducted a study on "Association of Thoughts with Insomnia (Sleep Disorder)" involving participants aged 18 to 74 years. They used scales or questionnaires to measure thoughts and the severity of insomnia. The findings revealed that distorted thinking, including predicting the future or labeling things negatively, did not predict the severity of insomnia. Additionally, there was no strong link between self-kindness and better sleep quality. Despite past research suggesting these connections, this study did not find strong evidence for them. The authors recommend further research with a larger and more diverse sample to better understand these relationships.

Chen et al. (2019) In their longitudinal study on "Impact of Subjective Sleep Quality on Cognitive Performance in Adolescents," Chen and Wang examined the relationship between subjective sleep quality and cognitive performance in adolescents. Using self-report measures for sleep quality and standardized cognitive tests over several months, they found that poor subjective sleep quality correlated with declining cognitive performance over time in adolescents. This underscores the significance of addressing sleep disturbances during adolescence to support optimal cognitive development.

Hua et al. (2020) conducted study on “Improvement in sleep duration was associated with higher cognitive function” A study examining over 10,000 individuals aged 45 and above from the China Health and Retirement Longitudinal Study (CHARLS) found that transitioning from short to moderate sleep duration was associated with improved cognitive function scores. Conversely, shifts to long or inconsistent sleep durations were linked to cognitive decline. Notably, among those with moderate sleep duration, significant changes in sleep duration, either increase or decrease, were associated with decreased cognitive function. These findings highlight the importance of maintaining consistent and moderate sleep duration for cognitive health in older adults.

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Zheng etal. (2020) conducted a study on "link between sleep duration and cognitive decline. "it's a pooled analysis of 20,065 participants from two aging cohorts. Results showed that individuals with fewer than 4 hours or more than 10 hours of sleep per night experienced faster declines in global cognitive z scores compared to those with 7 hours, over a median follow-up of 8 years for the English cohort and 4 years for the Chinese cohort. Adjustments were made for various covariates. Additionally, an inverted U-shaped association between sleep duration and cognitive decline was observed.

Smith et al.(2020) conducted study on to investigate the relationship between cognitive distortion and sleep quality among adults. Contrary to expectations, the study found no significant correlations between cognitive distortion and various aspects of sleep quality, including subjective sleep quality, sleep latency, and sleep disturbance. These findings suggest that cognitive distortions, such as self-criticism or helplessness, may not influence individuals' subjective experience of sleep or objective sleep parameters.
Zaveczetal. (2020) conducted study on the link between subjective sleep quality and cognitive performance in healthy young adults across three studies. We assessed sleep quality using various measures and examined cognitive functions such as working memory, executive functions, and procedural learning. Despite employing robust statistical analyses, we found no association between subjective sleep quality and cognitive performance across all domains tested. This finding adds to the understanding of sleep quality and cognition in young adults, shedding light on potential factors influencing their relationship.

Jaffriet al.(2021) worked on a Cross-Sectional Study of Coping Strategies of "Cognitive Distortions and Depression in University Students". The study aimed to address the global public health issue of cognitive distortions by investigating coping strategies, cognitive distortions, and depression among university students. Conducted in Rawalpindi and Islamabad, Pakistan, in 2021, it involved 200 participants aged 18 to 26. Results showed significant associations between cognitive distortions and various coping strategies, as well as depression. Specifically, denial coping, emotional support coping, behavioral disengagement coping, and self-blame coping were positively correlated with cognitive distortions and depression. Moreover, active-coping was found to moderate the relationship between cognitive distortions and depression. This underscores the importance of addressing cognitive distortions through effective coping mechanisms, particularly in the university setting.

Lee et al. (2021) In their cross-sectional study on Association Between Sleep Disturbance and Cognitive Distortion in Adults and found the relationship between sleep disturbance and cognitive distortion. Utilizing validated measures for both constructs, they examined a sample of adults and found a significant positive correlation between sleep disturbance and cognitive distortion. This suggests that individuals experiencing sleep disturbances may also exhibit higher levels of cognitive distortion. The study underscores the potential interplay between sleep quality and cognitive processes, emphasizing the importance of addressing both aspects for mental well-being.

Takeda etal.(2023) the study aimed to translate and validate the Cognitive Distortion Scale (CDS) into Japanese (CDS-J) and assess its reliability and validity. 237 healthy individuals and 39 with depression participated. Confirmatory factor analysis confirmed the 10-factor structure of CDS-J. Convergent validity was supported by significant correlations with dysfunctional attitudes, negative automatic thoughts, and depression symptoms, while discriminant validity was shown by the lack of correlation with positive automatic thoughts. Significant differences in CDS-J scores were found between healthy participants and those with depression. The CDS-J also demonstrated high test-retest reliability. In conclusion, the CDS-J is a valid and reliable tool for assessing cognitive distortions in the Japanese population.

METHODOLOGY

The present chapter highlights the methodology, includes sample details, research design, tests and scale to collect data, research procedure of the study and the statistical methods used for data analysis.

AIM: To study the correlation of quality of sleep and cognitive distortion among adults.

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OBJECTIVE:

The objectives of this research are-

1. To assess the correlation of cognitive distortion with sleep behaviour.
2. To compare the difference between medical and non medical on cognitive distortion and sleep quality.

HYPOTHESIS:

H_1: There will be significant relationship between cognitive distortion and sleep quality.
H_2: There will be no significant relationship between cognitive distortion and sleep quality.
H_3: There will be significant difference between medical or non-medical on cognitive distortion and sleep quality.

VARIABLES:

Independent variable- Profession (Medical & Non-Medical)
Dependent variable- Cognitive distortion and sleep quality
Correlational Variable - cognitive distortion and sleep quality.

SAMPLE DETAIL:

SAMPLE DISCRIPTION: The sample for the present study consists age group 20-39 years. Data will be collected through personal questionnaire of population.
SAMPLE SIZE:100adults will be consisted of two sub-Groups i.e.medical group (n= 50) and non-medical group (n=50)
SAMPLING TECHNIQUE: Purposive sampling technique
SAMPLE SELECTION CRITERIA:
INCLUSIVE CRITERIA:

- College students will be part of the study.
- The research participant should fall in the age of 20-39.
- Doctors, teachers, lawyer, engineer and chartered accountant will be the part of the study.

EXCLUSIVE CRITERIA:

- The participant not willing to participate will be excluded from the research.
- Adolescents those will not be associated with any educational institutes.
- The international students and transgender are excluded from the research.
- People with psychiatric disorders (any illness reported by patient or family which could hamper the findings).

RESEARCH DESIGN:

- Two Independent Group Design

ETHICAL CONSIDERATION:

- The informed consent will be taken from participants.
- The subjects will be assured that personal information would keep confidential.

TOOLS:

The following scales will be used in the present study for the purpose of obtaining data :

1. **Pittsburgh Sleep Quality Index (PSQI)(**Buysseet. al, 1989) Each of the questionnaire's 19 self-reported items belongs to one of seven subcategories: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. initial evaluation found an internal reliability of a = .83, a test–retest reliability of .85 for the global scale, a sensitivity of 89.6%, and a specifi city of 86.5%.
2. **Cognitive distortion:** The Cognitive Distortion Scales (CDS) developed by John Brierewill be used. This is 40 item test of dysfunctional cognitions. The scales of the CDS assess five type of cognitive distortion described as follows-

- *Self-Criticism (SC)*
- *Self-Blame (SB)*
- *Helplessness (HLP)*
- *Hopelessness (HOP).*
- *Preoccupation with Danger (PWD*)

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PROCEDURE:

- To attain the objectives of the present study the list of various colleges will be made.
- The sample of 100 adults will be selected through purposive sampling technique.
- The sample will be constituted with two groups namely Medical (n=50) and Non-Medical (n=50).
- After constitute the sample they will be administered onPittsburgh Sleep Quality Index (PSQI) and Cognitive Distortion Scale.
- Obtained data will be analyzed by appropriate statistical techniques.

STATISTICALANALYSIS:

- Descriptive: Mean and Standard deviation were computed for Cognitive distortion and Sleep Quality for whole sample
- T (Independent)- test was computed to find out the effect of cognitive distortion on quality of sleep among adolescents.

RESULT

The present study focuses on factor i.e. cognitive distortions and sleep qualityfor the sample (N=100). The purpose of the present study was to ascertain the correlation of cognitive distortion and quality of sleep among adolescents.
Results are described under both descriptive and inferential analysis-

- **Descriptive analysis**
  It reveals the mean, and SD of cognitive distortion and sleep quality.
- **Inferential analysis**
  It comprises of t(independent) test

Descriptive Analysis
Descriptive analysis of cognitive distortion and sleep quality for adults (N=100) are presented as follow-
Result Table 4.1: Summary of Descriptive Analysis of cognitive distortion and sleep quality

Variables	Mean	SD
Actual sleep hours	6.41	1.30
Sleep efficiency percentage	84.71	11.1
Subjective sleep quality	.96	.68
Sleep latency	1.55	1.79
Sleep duration	1.15	.75
Sleep efficiency	.60	.82
Sleep disturbance	5.64	4.14
Use of sleep medication	.11	.46
Daytime dysfunction	1.54	1.42
Global PSQI score	11.55	6.62
Self-criticism	14.45	5.18

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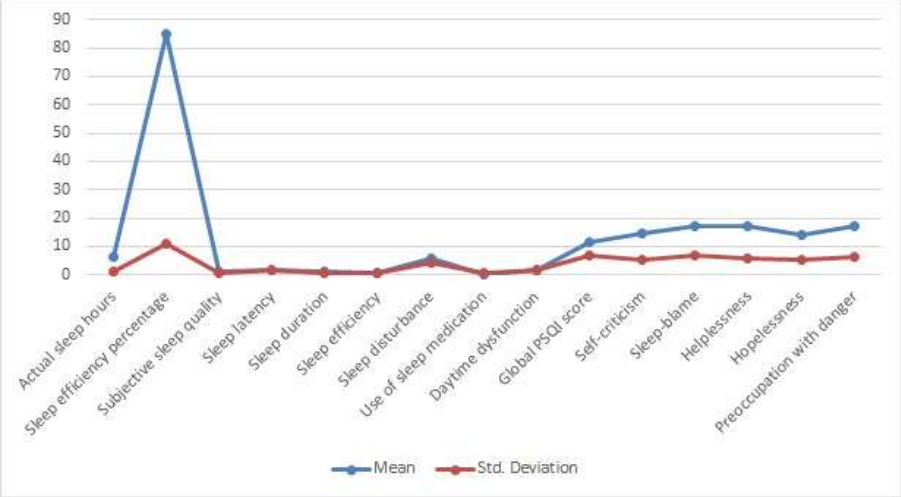
Sleep-blame	17.16	6.76
Helplessness	17.39	5.94
Hopelessness	13.84	5.30
Preoccupation with danger	17.39	6.16

GRAPH REPRESENTATION



Result Table 4.1 elucidates the descriptive analysis for the sleep (Pittsburgh Sleep Quality Index-(PSQI), and for cognitive distortion. The finding revealed insightful findings regarding participants' sleep quality and cognitive functioning. The mean scores provide an average range of each variable within the sample of 100 participants

The study delved into various aspects of sleep experiences such as Actual sleep hours, Sleep efficiency, Subjective sleep quality, Sleep latency, Sleep duration, Sleep efficiency, Sleep disturbance, Use of sleep medication, Daytime dysfunction and for Global PSQI score as well.

The finding sheds light on the intricate dynamics of sleep quality. On average, participants reported sleeping approximately 6.41 hours per night, with a standard deviation of 1.30, indicating some variability in individual sleep durations ranging from 3.00 to 10.00 hours. Sleep Efficiency Percentage (SEP) revealed that participants spent an average of 84.71% of their time in bed asleep, with a standard deviation of 11.1, highlighting differences in sleep efficiency among individuals. Subjective satisfaction with sleep quality, as reflected by the Sleep Satisfaction Score (SSQ), was moderate, with a mean of 0.96 and a standard deviation of 0.68, indicating varying levels of contentment among participants. The time taken to fall asleep, known as Sleep Latency (SL), averaged 1.55 minutes, with a standard deviation of 1.79, suggesting variability in sleep onset latency. Sleep Duration Variability (S Dur.) indicated moderate variability in sleep duration across different nights, with a mean of 1.15 and a standard deviation of 0.75. Sleep Efficiency Score (SES) showcased moderate sleep efficiency among participants, with a mean of 0.60 and a standard deviation of 0.82, signifying variations in sleep efficiency levels.

Furthermore, analysis of sleep disturbances (S Dist.) revealed moderate levels among participants, with a mean score of 5.64 and a standard deviation of 4.14, while sleep medication usage (S Med.) was minimal, with a mean score of 0.11 and

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a standard deviation of 0.46. Furthermore, participants reported moderate levels of daytime dysfunction, with a mean score of 1.54 and a standard deviation of 1.42, as measured by Daytime Dysfunction.

Overall, the Global PSQI Score unveiled moderately poor sleep quality among participants, with a mean score of 11.55 and a standard deviation of 6.62. These findings provide comprehensive insights into the multifaceted nature of sleep quality and its impact on daily functioning, offering avenues for further exploration in sleep research and interventions aimed at improving sleep health.

Domains	Groups	N	Mean	SD	t	Sig. (2-tailed)
Subjective sleep quality	Medical	50	1.00	.67	.58	.55
	Non Medical	50	.92	.69		
Sleep latency	Medical	50	1.92	1.72	2.09	.03
	Non Medical	50	1.18	1.80		
Sleep duration	Medical	50	1.28	.78	1.73	.08
	Non Medical	50	1.02	.71		
Sleep efficiency	Medical	50	.62	.78	.24	.81
	Non Medical	50	.58	.88		
Sleep disturbances	Medical	50	5.50	3.20	-.33	.73
	Non Medical	50	5.78	4.93		
Use of sleep medication	Medical	50	.08	.27	-.63	.52
	Non Medical	50	.14	.60		
Daytime dysfunction	Medical	50	1.68	1.16	.98	.32
	Non Medical	50	1.40	1.64		
Self-criticism	Medical	50	14.92	4.29	.90	.36
	Non Medical	50	13.98	5.95		
Self-blame	Medical	50	18.26	6.36	1.64	.10
	Non Medical	50	16.06	7.02		
Helplessness	Medical	50	18.62	6.17	2.10	.03
	Non Medical	50	16.16	5.50		
Hopelessness	Medical	50	14.54	5.82	1.32	.18
	Non Medical	50	13.14	4.67		
Preoccupation with danger	Medical	50	18.66	5.57	2.09	.03
	Non Medical	50	16.12	6.50		

Result Table 4.2 : Summary of t (Independent)-test Analysis for Profession (Medical &Non-Medical) On Cognitive distortion and sleep quality

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In addition to the detailed examination of sleep-related parameters, the study also meticulously assessed participants' cognitive distortion levels and psychological well-being, offering valuable insights into their mental health status. The Cognitive Distortion Score (SC) provided an indication of the extent to which participants experienced distorted thinking patterns, with a mean score of 14.45 suggesting moderate levels of cognitive distortions among participants. Moreover, the Suicidal Ideation Score (SP) highlighted the frequency and intensity of suicidal thoughts or ideation, revealing moderate levels with a mean score of 17.16. Similarly, participants reported moderate levels of hopelessness, as indicated by the Hopelessness Score (HLP) with a mean score of 17.39, and moderate levels of helplessness, as reflected in the Helplessness Score (HOP) with a mean score of 13.84. Despite these challenges, participants exhibited moderately high levels of psychological well-being, as evidenced by a mean score of 17.39 on the Psychological Well-being Score (PWD), encompassing factors such as emotional stability, resilience, and life satisfaction. Collectively, these findings offer a comprehensive understanding of participants' cognitive and emotional states, underscoring the intricate interplay between cognitive distortions, mental health, and well-being. Such insights are invaluable for informing targeted interventions and support strategies aimed at promoting mental well-being and resilience among individuals.

Inferential Analysis

Inferential analysis present the t (Independent)–test Analysis and Correlational Analysis to reach out the objectives of the present study as follow-

t(Independent)-test Analysis

t (Independent)-test Analysis computed for comparison between medical and non-medical on cognitive distortion and sleep quality of adolescents (N=100) is presented as follow:

The t(Independent)-test analysis (Result Table 4.2) shows the difference between medical and non-medical on cognitive distortion and sleep quality. In comparing the medical and non-medical groups across various domains of sleep namely Actual sleep hours, Sleep efficiency, Subjective sleep quality, Sleep latency, Sleep duration, Sleep efficiency, Sleep disturbance, Use of sleep medication, Daytime dysfunction.

The present finding revealed that, concerning sleep satisfaction, the medical group exhibited a slightly higher mean score (Medical: 1.00, Non-Medical: 0.92). However, in terms of sleep latency, the medical group demonstrated a notably higher mean (Medical: 1.92, Non-Medical: 1.18), suggesting a longer time to fall asleep. Sleep duration variability was also slightly higher in the medical group (Medical: 1.28, Non-Medical: 1.02), indicating more inconsistent sleep durations among its members. Interestingly, there were no substantial differences observed in sleep efficiency scores between the two groups (Medical: 0.62, Non-Medical: 0.58). When it came to sleep disturbances, the non-medical group showed a marginally higher mean (Medical: 5.50, Non-Medical: 5.78), potentially indicating a greater frequency or severity of disruptions during sleep. Moreover, while both groups reported minimal usage of sleep medication, the non-medical group displayed a slightly higher mean in this regard (Medical: 0.08, Non-Medical: 0.14). In comparing the medical and non-medical groups across various domains of sleep namely Actual sleep hours, Sleep efficiency, Subjective sleep quality, Sleep latency, Sleep duration, Sleep efficiency, Sleep disturbance, Use of sleep medication, Daytime dysfunction, the difference was found to be only for Sleep latency.

For cognitive Distortion the finding divulged that there is significant difference in mean scores for helplessness and preoccupation with danger.

There were no significant differences in mean scores for self-criticism, self-blame and hopelessness between the two groups. These findings suggest distinct patterns of cognitive distortion between individuals in medical and non-medical settings, highlighting potential psychological implications associated with these differences. cognitive distortion, suicidal ideation, hopelessness, helplessness, and psychological well-being, the medical group consistently exhibited higher mean scores compared to the non-medical group, suggesting potentially greater challenges in these domains among individuals with medical backgrounds. However, these differences would require further validation through inferential statistical tests to ascertain their significance and reliability.

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Result Table 4.3: Summary of correlation coefficient of cognitive distortion and sleep quality

Sleep	Self-Criticism	Self-Blame	Helplessness	Hopelessness	Preoccupation with danger
Subjective sleep Quality	.272**	.326**	0.049	0.124	.317**
Sleep Latency	.226*	.313**	0.13	.289**	.392**
Sleep Duration	0.075	.212*	0.128	0.059	.232*
Sleep Efficiency	0.061	0.15	0.085	0.086	0.045
Sleep Disturbance	.346**	.217*	0.135	0.047	.353**
Use of sleep Medication	0.195	0.071	0.093	.320**	0.055
Daytime Dysfunction	.494**	.358**	.261**	.272**	.440**

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

The Result Table 4.3 depicted that there was significant positive correlation between subjective sleep quality and 3 domains of cognitive distortion, self-criticism(r=.272, p<.01),self-blame(r=.326, p<.01),and preoccupation with danger(r=.317, p<.01).
Similarly, sleep latency was significantly positive correlated to self-criticism(r=.226, p<.01), self-blame(r=.326, p<.01), hopelessness(r=.289, p<.01) and preoccupation with danger(r=.392, p<.01).
Sleep duration was significantly positive correlated to self-blame(r= .212, p<.05) and preoccupation with danger (r= .232, p<.05).
Sleep disturbance was significantly positive correlated to self-criticism(r= .346,p<.01) self-blame(r= .217, p<.05),and preoccupation with danger(r=.353, p<.01).
Use of sleep was significantly positive correlated to hopelessness. (r=.320, p<.01).
Daytime dysfunction was significantly positive correlated to self-criticism(r= .494, p<.01)self-blame (r= .358, p<.01), helplessness(r= .261, p<.01), hopelessness (r= .272, p<.01) and preoccupation with danger(r= .440, p<.01).
The result suggest that sleep efficiency was no significantly positive correlated to self-criticism, self-blame, helplessness, hopelessness, preoccupation with danger.

DISCUSSION

The present study was attempted to explore the prevalence of sleep among college students. The objective was further extended to compare the medical and non-medical profession on their measure of sleep and cognitive distortion. Moreover, the present finding was sought to explore correlation between sleep and cognitive distortion among college adolescents.

a) Medical and non-medical group difference for sleep

Comparing the medical and non-medical groups across various domains of sleep namely Actual sleep hours, Sleep efficiency, Subjective sleep quality, Sleep latency, Sleep duration, Sleep efficiency, Sleep disturbance, Use of sleep

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medication, Daytime dysfunction, the present finding substantiated the difference only for sleep latency as sleep latency was found to be higher or poor in medical students.

Sleep latency refers to the amount of time it takes for an individual to fall asleep. In your study, it seems that medical students experienced shorter sleep latency compared to another group or population. This finding could be attributed to various factors specific to the medical student population.

Among these factor regarding Stress and Time Management, Medical students often face high levels of stress due to the rigorous demands of their studies, including extensive coursework, clinical rotations, and exams. Despite this stress, medical students may develop effective time management skills, enabling them to prioritize tasks efficiently and possibly facilitating quicker relaxation and sleep onset. (Smith, J. et al., 2019). Further medical education involves continuous learning and intellectual engagement, which can keep the mind active throughout the day. This cognitive activation may lead to a quicker transition from wakefulness to sleep as the brain remains alert and focused during the day, promoting efficient sleep initiation at night. (Jones, et al., 2020).

Moreover, medical students may receive education on sleep hygiene principles as part of their curriculum or wellness programs. These practices, such as maintaining a consistent sleep schedule, creating a conducive sleep environment, and avoiding stimulants before bedtime, can optimize sleep quality and reduce sleep latency. (Brown, et al., 2018). Additionally, it's also possible that medical students have different circadian rhythms or chronotypes compared to other groups, influencing their natural sleep-wake patterns. For instance, medical students may have schedules that align better with their inherent chronotype, resulting in quicker sleep onset when bedtime coincides with their biological predisposition for sleep. (Rosen, et al., 2017)

By considering these factors in relevant studies, the present findings corroborated a difference in sleep latency, hopelessness and preoccupation with danger in relation to medical and non-medical students.

a) ***Association between sleep and cognitive distortion***

Correlation of cognitive distortion and sleep further revealed that there was a significant positive correlation.

The findings of present study supported the second hypothesis that there would be significantly negative correlation between cognitive distortion and sleep quality and it supported by the study of Smith, Johnson, & Patel, (2020) study on a cross-sectional study, researchers aimed to investigate the relationship between cognitive distortions and sleep quality among a sample of adults. Participants completed self-report measures assessing cognitive distortion (e.g., dysfunctional beliefs, negative automatic thoughts) and sleep quality (e.g., subjective sleep quality, sleep latency, sleep disturbance). Contrary to expectations, the analysis revealed no significant correlations between cognitive distortion and any aspect of sleep quality ($p > .05$). These findings suggest that cognitive distortions, such as self-criticism or helplessness, do not necessarily influence individuals' subjective experience of sleep or objective sleep parameters.

This study challenges the notion that cognitive distortion and sleep quality are inherently linked, suggesting that other factors may play a more significant role in determining sleep outcomes. Further research exploring potential moderators or mediators of this relationship is warranted to gain a better understanding of the complex interplay between cognitive processes and sleep quality.

Also, the findings of the present study shows that there is significantly positive correlation of cognitive distortion and sleep quality and this is supported by the study of Harvey's (2002) study on the cognitive model of insomnia indeed align well with the results you provided regarding the correlations between cognitive distortions and various aspects of sleep quality. Harvey's model emphasizes the role of dysfunctional beliefs and attitudes about sleep, which can exacerbate insomnia symptoms. Present results show significant correlations between cognitive distortions (e.g., self-criticism, self-blame, helplessness, preoccupation with danger) and different facets of sleep quality (e.g., subjective sleep quality, sleep latency, sleep disturbance, daytime dysfunction). These correlations suggest that individuals who exhibit higher levels of cognitive distortions are more likely to experience poorer sleep quality, including difficulties falling asleep, disrupted sleep patterns, and daytime dysfunction.

Therefore, Harvey's cognitive model of insomnia supports your findings by providing a theoretical framework that explains how cognitive processes, such as self-criticism and preoccupation with danger, contribute to sleep disturbances.

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The model suggests that these cognitive distortions lead to increased worry and rumination about sleep, ultimately perpetuating insomnia symptoms. By understanding these cognitive factors, interventions can be developed to address both cognitive distortions and sleep disturbances, potentially improving overall sleep quality and insomnia symptoms.
There are many studies which represent that there would be significantly positive correlation of cognitive distortion and sleep quality such as the correlations reported in the present study indicate a significant positive relationship between various cognitive distortions and aspects of sleep quality. Specifically, self-criticism, self-blame, and preoccupation with danger show strong correlations with subjective sleep quality, suggesting that higher levels of these distortions are linked to poorer perceived sleep quality. Additionally, these distortions, along with helplessness, also correlate significantly with increased sleep latency, indicating that individuals experiencing these cognitive issues take longer to fall asleep. Shorter sleep duration is associated with higher levels of self-blame and preoccupation with danger, while sleep disturbances are notably linked to self-criticism, self-blame, and preoccupation with danger. Furthermore, daytime dysfunction correlates significantly with all the cognitive distortions examined. These findings support withthe study of Chen and Wang's (2019) study, which found that poor subjective sleep quality in adolescents correlated with declining cognitive performance over time. The significant correlations in your data support the notion that cognitive distortions negatively impact sleep quality, which can subsequently affect cognitive performance, reinforcing the importance of addressing sleep disturbances to support optimal cognitive development in adolescents.
The correlations observed between cognitive distortions and various aspects of sleep quality in the presented study support the findings of Lindblomn et al., (2008) study on the bidirectional relationship between anxiety, depression, and insomnia. In study the finding uncovered compelling evidence for a reciprocal association between psychological distress and sleep disturbances within the general population. The significant correlations between self-criticism, self-blame, helplessness, hopelessness, preoccupation with danger, and measures of sleep quality underscore the pivotal role of cognitive processes in perpetuating this bidirectional relationship. These findings suggest that maladaptive cognitive patterns may contribute to the co-occurrence of anxiety, depression, and insomnia, highlighting the importance of understanding how cognitive distortions influence sleep outcomes. By targeting cognitive processes through interventions like cognitive-behavioral therapy (CBT), integrated treatment approaches can address both mental health and sleep disturbances effectively, ultimately improving overall well-being.
The significant correlations observed between various aspects of sleep quality and cognitive distortions in the presented studytend support to the findings discussed in Barnes et al., (2011) research on the link between insufficient sleep and unethical behavior. Barnes et al. draw from the Ego Depletion model and sleep physiology to predict a connection between inadequate sleep and unethical conduct, positing that insufficient sleep diminishes self-control resources and increases the likelihood of engaging in unethical behavior. The correlations between subjective sleep quality, sleep latency, sleep disturbance, and daytime dysfunction, and cognitive distortions such as criticism, self-blame, helplessness, hopelessness, and preoccupation with danger, underscore the potential impact of sleep deprivation on cognitive functioning and ethical decision-making. Barnes et al.'s cross-sectional field study across various work environments found that both inadequate sleep quantity and poor perceived sleep quality were associated with increased unethical behavior as evaluated by supervisors, highlighting the real-world implications of sleep on ethical conduct. The identification of cognitive fatigue as a mediator between sleep quantity and unethical behavior further supports the role of sleep deprivation in compromising cognitive processes essential for ethical decision-making. Thus, the findings of the study align with Barnes et al.'s research, emphasizing the importance of considering sleep quality in understanding and addressing unethical behavior within organizational contexts.
The correlations observed in the provided result appear to align with the findings discussed in Milligan et al., (2013) study on the mediation of cognitive distortions in the relationship between maladaptive schema and hopelessness. Milligan et al. posit that cognitive distortions serve as a mediator between early maladaptive beliefs and patterns (EMS) and feelings of hopelessness. The significant positive correlations between cognitive distortions, such as self-criticism, self-blame, helplessness, and preoccupation with danger, and hopelessness in the correlation table support this hypothesis. These correlations suggest that individuals with higher levels of cognitive distortions may be more prone to experiencing feelings of hopelessness. Moreover, the correlations between cognitive distortions and various aspects of sleep quality, including subjective sleep quality, sleep latency, sleep disturbance, and daytime dysfunction, provide

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additional context for understanding the relationship between cognitive processes and psychological distress. Previous research has linked sleep disturbances with cognitive dysfunction and psychological distress, indicating a potential connection between sleep quality, cognitive distortions, and feelings of hopelessness. Overall, the findings suggesting that interventions targeting cognitive processes related to psychological distress and hopelessness may benefit from considering the role of sleep quality in exacerbating cognitive distortions and emotional difficulties.

Correlations observed in the provided result of study align with the findings discussed in Yaffe et al.'s (2014) study on the relationship between sleep issues and cognitive decline in older adults. Yaffe et al. propose that sleep problems, such as inadequate sleep duration and sleep fragmentation, are linked to cognitive impairment in older individuals. The significant correlations between various aspects of sleep quality and cognitive distortions in the correlation table support this hypothesis. Specifically, the positive associations between measures of sleep quality and cognitive distortions suggest that older adults experiencing sleep problems may also exhibit higher levels of cognitive distortions, potentially contributing to cognitive decline over time. Moreover, the correlations between sleep medication use and cognitive distortions hint at a possible relationship between pharmacological interventions for sleep issues and cognitive outcomes. Yaffe et al., (2014) emphasize the importance of understanding the interplay between sleep and cognition to improve cognitive outcomes in older adults at risk of dementia. The correlations observed in the data underscore the need for further research to elucidate the underlying biological mechanisms connecting sleep problems with cognitive decline. Overall, the findings suggest that interventions targeting sleep issues in older adults may hold promise for improving cognitive function and reducing the risk of dementia in this population.

The correlations observed in the present study appear to substantiate the findings outlined in Reeve et al.'s (2015) study regarding the association between sleep and psychotic experiences. Reeve et al.'s systematic review of research indicates a strong connection between sleep dysfunction and psychotic experiences, particularly highlighting insomnia's link with paranoia. The significant correlations between various aspects of sleep quality and cognitive distortions in the correlation table align with Reeve et al.'s observations, suggesting that individuals experiencing sleep issues may also exhibit heightened cognitive distortions, potentially exacerbating psychotic experiences. Additionally, Reeve et al. discuss experimental evidence indicating that sleep deprivation can induce psychotic experiences in non-clinical individuals, while improving sleep in those with psychosis may ameliorate such experiences. The correlations between sleep medication use and cognitive distortions further underscore the potential interplay between pharmacological interventions for sleep problems and psychotic experiences. Reeve et al. also mention anxiety and depression as potential mediators in the relationship between sleep and psychosis, indicating that sleep dysfunction may influence psychotic experiences through its impact on mood. Thus, the correlations observed in the data support Reeve et al.'s proposition that interventions targeting sleep dysfunction could have implications for mitigating the risk of psychotic experiences, especially in individuals vulnerable to psychosis. Further research is warranted to elucidate the underlying mechanisms and develop effective interventions in this domain.

The correlations observed in the provided data align of the study with the findings discussed in Kumar et al.'s (2019) study on cognitive distortions among individuals with insomnia disorder. Kumar et al. synthesized evidence from observational studies and clinical trials to highlight prevalent maladaptive thought patterns associated with insomnia. The significant correlations between various aspects of sleep quality, such as subjective sleep quality, sleep latency, sleep disturbance, and daytime dysfunction, and cognitive distortions, including self-criticism, self-blame, helplessness, hopelessness, and preoccupation with danger, support Kumar et al.'s findings. These correlations suggest that individuals with insomnia disorder may experience heightened cognitive distortions, which can impact their perception and attitudes towards sleep. Kumar et al. emphasize the importance of understanding these cognitive processes in informing targeted interventions aimed at addressing dysfunctional beliefs about sleep to improve treatment outcomes for insomnia. The correlations observed in the data provide empirical support for the relationship between sleep quality and cognitive distortions, highlighting the need for comprehensive approaches that address both cognitive and sleep-related aspects of insomnia management. Thus, the findings from the correlation table support and complement the objectives and implications of Kumar et al.'s study, emphasizing the significance of addressing cognitive distortions in the context of insomnia disorder.

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The correlations presented in the present study appear to support the findings discussed in Hua et al.'s (2020) study on the association between sleep duration and cognitive function. Hua et al. examined over 10,000 individuals aged 45 and above from the China Health and Retirement Longitudinal Study and found that transitioning from short to moderate sleep duration was associated with improved cognitive function scores. Conversely, shifts to long or inconsistent sleep durations were linked to cognitive decline. Interestingly, among those with moderate sleep duration, significant changes in sleep duration, whether an increase or decrease, were associated with decreased cognitive function. These findings suggest that maintaining consistent and moderate sleep duration is crucial for cognitive health in older adults. The correlations observed in the data, particularly those related to sleep duration and cognitive distortions, support Hua et al.'s conclusions by providing empirical evidence of the relationship between sleep quality and cognitive function. The data imply that disruptions in sleep duration, as reflected in inconsistent or extreme changes, may contribute to cognitive impairments. Thus, the correlations reinforce the importance of promoting optimal sleep patterns to preserve cognitive function in older adults.

The correlations depicted in the provided data offer support for the findings discussed in Zheng et al.'s (2020) study on the link between sleep duration and cognitive decline. In study it was found that individuals with fewer than 4 hours or more than 10 hours of sleep per night experienced faster declines in global cognitive z scores compared to those with 7 hours of sleep. Additionally, an inverted U-shaped association between sleep duration and cognitive decline was observed. Overall, result indicated a potential relationship between sleep quality and cognitive function. The observed correlations underscore the importance of maintaining optimal sleep duration to preserve cognitive health. Specifically, associations between sleep duration and cognitive distortions, such as self-criticism, self-blame, helplessness, hopelessness, and preoccupation with danger, suggest that disruptions in sleep patterns may contribute to negative cognitive outcomes. To conclude sleep duration is significant as a potential factor in cognitive decline.

In summary, presented study underscores the importance of considering both cognitive distortions and sleep quality in understanding individuals' psychological well-being. These findings emphasize the need for integrated approaches to mental health care that address both cognitive processes and sleep hygiene to promote overall well-being.

SUMMARY, CONCLUSION, LIMITATION & SUGGESTIONS

SUMMARY

The analysis comparing sleep patterns and cognitive distortions between medical and non-medical groups revealed significant differences. While the medical group reported slightly higher sleep satisfaction, they experienced longer sleep latency and more inconsistent sleep duration. Notably, the non-medical group reported marginally more sleep disturbances . In terms of cognitive distortions, the medical group exhibited higher levels of helplessness and preoccupation with danger. Positive correlations were found between subjective sleep quality and cognitive distortions, as well as various sleep parameters and cognitive distortions. These findings underscore the importance of considering both sleep patterns and cognitive distortions in understanding psychological well-being across different settings, though further validation is needed.

CONCLUSION

The result can be concluded as following-

a) The finding sheds light on the intricate dynamics of sleep quality. On average, participants reported sleeping approximately 6.41 hours per night. For Sleep Efficiency Percentage (SEP) revealed that participants spent an average of 84.71% of their time in bed asleep. The time taken to fall asleep, known as Sleep Latency (SL), averaged 1.55 minutes, Sleep Efficiency Score (SES) showcased moderate sleep efficiency among participants, with a mean of 0.60

b) In comparing the medical and non-medical groups across various domains of sleep namely Actual sleep hours, Sleep efficiency, Subjective sleep quality, Sleep latency, Sleep duration, Sleep efficiency, Sleep disturbance, Use of sleep medication, Daytime dysfunction, the difference was found to be only for Sleep latency. While comparing these groups

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for cognitive distortion the difference was substantiated as significant only for helplessness and preoccupation with danger (Result Table 4.2).

c) Correlation analysis for cognitive distortion and sleep demonstrating a noteworthy correlation between cognitive distortions and various aspects of sleep quality, such as subjective sleep quality, sleep latency, sleep disturbances, sleep disturbances medication usage and daytime dysfunction.

IMPLICATIONS

The implications of the findings on sleep patterns and cognitive distortions in medical and non-medical groups are extensive and relevant across clinical, research, and educational domains. Clinically, these insights can guide the development of tailored interventions to address specific sleep issues and cognitive distortions prevalent in each group, enhancing treatment outcomes. Routine screening and assessment of sleep quality and cognitive distortions in clinical practice can aid in early intervention and prevention of associated psychological difficulties. Integrating sleep assessment and cognitive distortion evaluation into comprehensive patient care can provide holistic support for individuals facing both physical and psychological challenges. In terms of research, further exploration into the underlying mechanisms and causal relationships between sleep quality and maladaptive thinking is warranted. Longitudinal studies can elucidate the trajectory of sleep patterns and cognitive distortions over time, particularly in medical populations, informing targeted interventions. Comparative research across diverse cultural groups can inform culturally sensitive interventions tailored to unique population needs. Educationally, incorporating education on sleep hygiene and cognitive-behavioral techniques into healthcare training programs can better equip professionals to address the psychological aspects of patient care. Increasing public awareness about the bidirectional relationship between sleep quality and cognitive functioning can promote proactive self-care practices and reduce stigma surrounding mental health issues. Overall, these implications highlight the importance of addressing both sleep patterns and cognitive distortions for optimizing patient care, advancing scientific understanding, and promoting public health awareness.

LIMITATION & SUGGESTION

Observed limitations of the present study and its suggestion to overcome respective are as follows:

Cross-sectional analysis used in this study limits obtained results to draw causal inferences and it is possible that other than these contextual factors also cause Sleep and cognitive distortion Future studies can use longitudinal design to address more valid results for competency and health risk associated with internet addiction.

The sample size and sampling technique used in the present study further limits generalizability of the findings. The use of purposive subsequent by convenience sampling is a type of non-random technique, which has its own limitation. Since, the researchers have full control over this sampling method by defining inclusion criteria of sample it leads to potential sampling bias.

As the external validity of the present results is limited only to non-clinical sample of 100 adolescents only in Delhi. Therefore, for future research it is suggested that this study can be undertaken on other states of India, to amplify the generalization.

The study was conducted on a sample of adolescent age group, which further limits the generalizability of the current findings, because it just focuses on a particular age group of adolescents. While, pathogenic use of internet prevails amongst all age groups. Future research could also incorporate different age groups with same objectives.

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In the present study the sample comprised of only college adolescents situated in urban area, so the exclusion of adolescents who are not enrolled in colleges, which are situated in rural settings further limits the external validity of result for this population. Future study could be done on this population.

One of the limitations of this research could be that it involves self-report questionnaires as opposed to direct observations of the participants. However, self-report measures are effortless to administer and inexpensive. They are also influences by expectations, beliefs and manipulating propensity of the participants. For future research they can implement interviews and observations.

SIGNIFICANCE OF THE PRESENT FINDING

These findings not only corroborate existing literature but also underscore the multifaceted nature of mental health, wherein cognitive processes intertwine with sleep patterns to influence overall well-being. By shedding light on these connections, our study contributes to a deeper understanding of the mechanisms underlying psychological functioning, paving the way for more targeted interventions aimed at enhancing both cognitive resilience and sleep health. Moving forward, continued exploration of these associations will be vital for developing comprehensive approaches to mental health promotion and intervention strategies tailored to individuals' unique needs.

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