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RESEARCH ARTICLE

SLEEP AND MOOD

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Abstract

The relationship between sleep and mood have been studied extensively over the years (Benca et al, 1997; Morin, C. M., Gibson, D., & Wade, J., 1998; Buysse, 2004; Rosen et al, 2006; Peterson & Benca, 2006; Oates, 2020). The relationship is especially intriguing when age is involved. There is a small but growing body research on sleep and mood in relation to young people (Matricciani et al, 2012; Sadeh, Raviv & Gruber, 2000). This research study investigated the relationship between sleep, mood and age among young adults by using qualitative methods and data, specifically a survey. The results of the survey clearly validate the significant role of sleep in every individual's life. The results show that people reported to have perceived links between lack of sleep and negative moods. Further studies need to be done to confirm the relationship of sleep and mood in young adults in various areas around the world, and to study the impact of contextual factors such as location, culture, and gender, and levels of awareness and mindfulness.

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Introduction:-

Over the many years of civilization, sleep has been an enigmatic aspect that has not only captivated our imaginations but also driven researchers to investigate it for the past fifty years (Horne, 1988). During times of stress, especially in young adults learning to maneuver new environments, sleep is often compromised. Young adults often have to deal with stress and mental fatigue in relation to schoolwork, as evidenced by self-reports and complaints about physical aches and pains, such as headaches (Torsheim & Wold, 2001; Anda et al, 2001). Stress and mental fatigue has been exacerbated by the current situation in which most classes are now online, causing a huge change in how people engage with education. These changes have upset routines of many people, causing anxiety (Daniel, 2020). Even without these changes and their psychological effects, the complexity of these decisions are often overlooked.

Sleep and mood are so important, and are interrelated in many ways. Inadequate sleep is seen by some people as a consequence of "modern life," associated with technologies of the time. (Matricciani et al, 2012). Most young adults do not know how to identify their moods and hence, do not realize how largely impacted their moods are with the amount of sleep they had that night. Sleep has effects on the mental processes (Brown, 2005), and also social interactions (Kahn-Greene et al, 2006).

Age has a role to play in sleep as well. Studies have looked at sleep and sleep disorders happening from young age (Sadeh, Raviv & Gruber, 2000) to old age (Ancoli-Israel, 2009). Typically, very young children and teenagers sleep longer than adults do, with sleep reducing by about -0.73 minute per year (Matricciani et al, 2012).

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There is a lack of research that discusses sleep and mood in relation to young adults. The results also need to be communicated to the stakeholders. Therefore, it is clear that there is a pressing need to study sleep and mood in relation to young adults.

Goals:

- 1) To explore through reading and research, how sleep and mood are related.
- 2) To identify the relationship between sleep and mood through a survey given to young adults and teenagers.
- 3) To identify and disseminate the outcome/findings of this project (research paper) to all the teenagers in my school so that they are aware of how important and crucial sleep is and how it affects your mood on a daily basis.

Chapter 2: Background

Over the past few years, many researchers have studied various aspects of sleep and mood (Benca et al, 1997; Morin, C. M., Gibson, D., & Wade, J., 1998; Buysse, 2004; Rosen et al, 2006; Peterson & Benca, 2006). It would be useful to start off with a definition of what sleep and mood are respectively. Sleep was defined as a time of rest from the ancient times. Ancient Greek philosophers were known to have theorized about sleep and its causes. Most recently, technological advancements have led to more nuanced definitions of sleep from various branches of science including biology, neurology and psychology. From a purely behavioural perspective, sleep was conceived in 1905 by the French neurologist Dr. Claparede as the body's instinctual way to prevent intoxication and exhaustion (Horne, 1988). According to Horne (1988), sleep is a process initiated by the internal biological clock of living creatures, characterized by particular brain activity, a "typical body posture", in a specific place in which it exhibits this behaviour, and physical inactivity. Additionally, the definition of sleep includes the fact that it is a regular daily occurrence controlled by an internal circadian clock. Also, additional stimulation is required to rouse the animal than when it is fully awake.

The Role of sleep

Researchers have looked at sleep in many ways. Horne (1988) mentions that early theories saw it as a recovery process while most focused on the mechanisms that produce sleep, as opposed to what sleep does, mainly it is recognized to encompass. According to Horne (1988), sleep is viewed as restoration, energy conservation, and as an occupier of time. However, a close look at sleep functions suggests that the organ that shows the clearest changes during sleep and wakefulness is the brain (Horne, 1988). Indeed, sleep plays a multifaceted role in the lives of humans. In human beings, the role of sleep has been researched in relation to learning and memory (Macquet, 2001) and metabolism (Leprout & Cauter, 2011) to cognition and emotion (Walker, 2009). Emotionality is interlinked to the idea of mood in human beings. Researchers have also defined mood in various ways. A mood is above all a temporary emotional state, such as happiness, sadness, fatigue, and so on.

Recent developments in the neuroscience of sleep

In a lecture by Professor Karen Oates (2020), the different types of brain activity that goes on while a person is asleep has been described. Researchers such as Hobson & McCarley (1977) were first to identify the various brain waves and the associated brain activities. Brain Activity can be determined by means of an EEG (an electrocardiogram). There are two different types of sleep: REM sleep and non-REM sleep. REM is called paradoxical sleep as the brain looks like it is awake. New information that was learned is better absorbed after a period of sleep as it creates new neural pathways and hence, sleeping is a great way to absorb new information and make sure the brain retains it. In addition, some studies have looked at napping for short periods, as opposed to nighttime sleep (Arora et al, 2006; Goldman et al, 2008). Napping has been found to be related to nighttime sleep, especially in older individuals, who benefited from taking a nap, as it was found to improve their sleep at night (Tanaka et al, 2002).

Neurotransmitters in the brain are what control sleep and wakefulness. This is an important link to mood because neurotransmitter imbalances are linked to mood disorders like anxiety, depression, and PTSD. Sleep deprivation was found to have an effect on decision making (Harrison & Horne, 2000; Killgore, Balkin & Wesensten, 2006).

In addition, they also investigated the various stages of sleep. Before delving into a discussion of the various stages of sleep, it may be useful to look at how researchers have classified various stages of sleep. Keenan & Hirschowitz (2011) investigated the various stages of sleep using electroencephalography (EEG). According to them, Stage N1 has low-voltage, mixed-frequency background, possibly slow eye movements, and vertex sharp waves. Stage N3 is characterized by high-voltage slow-wave activity. Stage N2 contains sleep spindles and K complexes. Researchers have specifically studied the transition between N1, N2, and N3 stages of sleep. While N1 and N2 are considered

light sleep, with the latter lasting about 10-25 minutes per cycle, N3 is when sleep becomes deeper. 55% of a grown individual's sleep time is spent in N2 (Oates, 2020). Oates (2020) cited studies that were not highly controlled, including one that studied people who considered themselves "morning people" (23andme, 2016). In the study that involved participants of European descent only, more women than men considered themselves "morning people". However, Oates (2020) cautioned against self-reports of people, including those who did not personally feel that lack of sleep affected them negatively, as fMRI scans showed the effects of lack of sleep on them (Journal of Brain and Behavior).

Lack of sleep is extremely costly, especially to Americans, each year. It follows that sleep deprivation is regarded as a public health concern. About a third of Americans are not getting enough sleep, making them prone to cardiovascular conditions, and accidents. Less sleep causes Americans is linked to an increase in hunger and the consumption of less nutritious food. Significantly, there are also gender differences in the way sleep affects people. It was found that when men were sleep deprived, they highly rated women's interest in sex. However, when women were sleep deprived, they did not report similar responses when rating the opposite gender's interest in sex. Overall, it is significant that lack of sleep affects productivity to a great extent, leading to an estimated loss of about \$411 billion per year for the United States of America.

The trajectory of sleep disorder research

Sateia (2014) & Thorpy (2012) laid out the classification of sleep disorders in the context of the world today. Oates (2020) reviewed the different types of sleep disorders. One of the common sleep disorders is insomnia and its common causes include mood disorders such as anxiety and depression, irregular hours, smartphone use leading to change in the serotonin and melatonin levels in the brain, and so on. Most adults suffer from insomnia at some point in their lives. Oates (2020) reported that 50-70 million Americans have sleep disorders. There are several symptoms of insomnia, including impaired sleep for three months and above, and impaired performance and fatigue during the daytime. There are also a myriad of complications of insomnia, including risk of heart diseases, diabetes, obesity, and so on. Crowley (2011) looked at sleep disorders in older individuals.

Sleep apnea is a common chronic condition characterized by frequent episodes of upper airway collapse when a person is sleeping (Punjabi, 2008). Two types of sleep apnea were reviewed by Oates (2020): Obstructive apnea and central nervous apnea. Obstructive apnea happens when throat muscles relax during sleep, while central nervous apnea happens when the brain does not send proper signals to the muscles controlling breathing. Some of the symptoms of sleep apnea include snoring, insomnia, fatigue and problems with breathing. REM Sleep Behaviour Disorder is a condition in which the muscles of the body are not paralyzed as they should be during sleep, causing the individual to enact their dreams while asleep. Restless leg syndrome is another sleep disorder that occurs in 15% of Americans (Oates, 2020). It involves the desire to move one's legs when asleep. Oates (2020) reviewed various drugs and medication used to combat sleep disorders, including one that regulated the serotonin and melatonin levels in the brain.

Relationships between sleep and mood

Many studies have investigated the link between mood and sleep. Saghir et al (2018) found that lack of sleep, including sleep deprivation and sleep debt result in anger. While O'Brien & Mindell (2010) studied sleep and risk-taking behavior in adolescents, Mindell & Lee (2015) assessed the relationship of sleep with mood and development in infancy. These results indicate that sleep patterns and sleep problems during infancy are associated with parental ratings of infant mood but not more global developmental outcomes. Konjarski et al (2018) reviewed the reciprocal relationship between sleep and mood. Findings indicated that there was a reciprocal relationship between subjective sleep variables such sleep quality and sleep duration and daytime affective states on a short-term basis, and also indicated the possible importance of daily sleep disturbance in the prediction and prevention of psychopathological development.

Studies have gone further in trying to move towards solutions towards the sleep and mood relationship. Watling et al (2016) summarized research looking at the relationship between sleep and emotion, emotion regulation, and mood. It presents a theoretical model to understand the relationships between these constructs, highlighting the negative effects of sleep on mood. Lawati et al (2009) also review the epidemiology, risk factors, and consequences of obstructive sleep apnea and short/long sleep duration. It was found that there were a number of risk factors for disease, such as obesity, male sex, and family history; and that habitual sleep duration can result in daytime sleepiness and diminished neurocognitive function. While Blagrove and Akehurst (2001) investigated personality

and the modulation of effects of sleep loss on mood and cognition, it was found many years later by Bowen et al (2013) that maintaining sleep and physical activity alleviate mood instability.

While researchers have studied sleep and mood and tried to provide solutions to the issues presented, there has also been research done on younger people in relation to sleep and mood. In other words, the age factor has also been considered. For example, Owens (2014) looked at the causes and consequences of lack of sleep in young people such as adolescents and young adults. Furthermore, Baroni et al (2017) studied the impact of a sleep course on sleep-related behaviors, mood, and anxiety in college students and found that focused education may improve sleep among college students.

There are many moods including, Cheerfulness, Reflective, Gloomy, Humorous, Melancholy, Idyllic, Whimsical, Romantic, Mysterious, Ominous, Calm, Lighthearted, Hopeful, Angry, Fearful, Tense, Lonely. But when you have not gotten enough sleep the night before, the mood options could tend to be lesser. Some of those moods could include, Grumpy, Mad, Sad, Unhappy, Bored, Unwilling, Unpleasant, and Unmotivated. These moods are a main result of having less sleep at night and choosing to do other things rather than maintaining a healthy sleep schedule. Once you sleep well, your mood often returns to normal. A mood is part of your emotional rhythm, but a little less intense than an emotion. And it usually has a trigger, such as an event or experience. In this case the trigger would be not getting enough or a healthy amount of sleep per night. You feel good when you are in a positive mood (such as when you feel content, loving or excited). You feel much worse when you are in a negative mood (such as when you feel anxious, disgusted or annoyed). Three factors combine to create Moods in the brain: biology (for example, hormones and brain chemicals), psychology (such as personality and learned responses), and environment (like illness and emotional stress). Understanding your moods helps you manage them and feel better faster. If you are aware of your moods, you may be able to better manage your lifestyle choices, make informed health decisions, prevent or avoid triggers of negative moods, and work towards a better quality of life. Watch for changes in your mood, particularly any very high swings or very low dips (which may mean you need help to even out your emotional state). Self-monitoring is crucial and takes hardly any time. The main and key way to manage your moods is to identify what the trigger is and change that, for example, if the reason why your mood is down because you slept late, perhaps you could sleep earlier or at a normal time that night for better results.

Why is sleep important, especially among younger generations?

One thing that is common within the younger generation - "millennials" - these days is their lack of sleep. The typical concern among them is that they are always tired. They complain about being exhausted all the time. That is because they are sleep-deprived. A good night's sleep is vital to our overall well-being, both to our physical and mental health. Studies have shown how having enough and restful sleep is connected to having good mental health. The lack of quality sleep increases the risk of having anxiety and depression. Millennials are dependent on technology, even addicted to an extent. While technology brings the ease and convenience it has, it also has its negative side effects. Millennials have their gadgets like their mobile phones readily at their disposal. Due to the fact that it is so convenient to connect online, it becomes an addiction. This convenience can pull them away from their everyday lives. There is this need to be always in the know, the fear of missing out. So even when they are about to sleep, they are still busy tapping away on their mobile phones. The blue light that phones emit restrains the production of melatonin, the hormone that regulates our sleep. Because the internet is inexhaustible when it comes to information – it stimulates brain activity delaying the much-needed sleep.

Variations in adolescent moods

Teenager's bodies are changing, which might make them self-conscious or embarrassed – or just make them want more privacy and time to themselves. Children who seem to be developing earlier or later than friends might feel emotional about these physical changes. Another physical factor affecting children's lives is their need for sleep to rest their body and mind. It is thought that teenagers need more sleep than they did when they were younger – about 8-10 hours each night, in fact. So the amount of sleep teenagers get is likely to affect their mood. Regular, nutritious meals and enough physical activity are good for a child's physical health and can help teenagers feel good emotionally too. The section of the brain that is the last to develop, the prefrontal cortex, is closely connected to the areas responsible for regulating and controlling emotions. This means young people can find it harder to control some of their more powerful emotions, and it might seem that they react more emotionally to situations than they used to. They are also still learning to process and express those emotions in a grown-up way. Young people can feel down for minutes, hours, days or much longer. If a child seems down, flat or sad for two or more weeks, or if a

person notices moods are stopping a child from getting on with her usual daily activities, this could be a sign of a more serious mental health problem.

Goal: To define clearly the relationship between sleep, mood, and age

1) To explore through reading and research, how sleep and mood are related and if a relationship can be made
 2) To Learn how mood is regulated, often we don't keep track of our moods and therefore moods itself is a huge concept. Maybe sleep is connected to mood, but how are we so sure that they are in a grumpy mood just because if they had slept. I'm hoping that most people should learn how to recognize their moods, it should be a priority, so I'm hoping that out of this research paper, they would do that.

1) To identify and disseminate the outcome/findings of this project (research paper) to all the teenagers in my school so that they are aware of how important and crucial sleep is and how it affects your mood on a daily basis. I am hoping that some students of a younger age (between 12-19) would be more aware about this topic too, considering that between those ages is when sleep becomes more important and we are allowed to make our own decisions on when we want to sleep, etc. they need to make more wise decisions regarding that topic.

Chapter 3:

Methods:-

For the purposes of this study, the qualitative approach was employed as it was deemed best suited to gather data from the participants. This is consistent with observations by Owens (2014), who pointed out that studies of sleep usually rely on self- or parent-reported questionnaire data to document adolescent sleep patterns and related information. As with various other methodologic approaches, studies generally find that both younger and older adolescents are not getting enough sleep. However, Owens (2014) noted that studies comparing self-reported sleep duration with actual sleep amounts showed that self-reports of sleep often overestimate actual sleep duration. This suggests that chronic sleep loss in adolescents may be even worse than the data indicate.

The design of the survey did not take into account actual sleep duration, but focused more specifically on the self-reports of sleep by adolescents. It was shaped by the features of the platform Google Forms which was deemed most apposite for the purposes of the research. After consultation with researchers and stakeholders, Google Forms was the best possible platform out of the several other platforms that were considered. The reason was that the platform was the one that students were most familiar with.

Survey methods

Survey items pertaining to the lack of sleep in young people such as adolescents and young adults and impact of knowledge of sleep on sleep-related behaviors, mood, and anxiety in young people were gleaned from the conceptual framework of Owens (2014) and Baroni et al (2017) and from the expert advice of researchers, professors, peers and teachers.

Communication between the researchers and the participants was open, transparent, and clear. Participants were assured of the anonymity and ethics of the study. There were 10 questions, including 6 open-ended questions, and one question based on the Likert scale.

As part of the study, the survey asked them various questions about their habits related to sleep and mood, including questions about various variables such as stress levels, time schedules related to sleep, and the number of hours of sleep they had each night. Some sample items are given below. The appendix lists the items in full.

Questions related to stress:

Have you ever felt stress?

What are the usual causes of stress in your life?

Describe in a few words the physical, emotional, and social sensations and the feelings you encounter when stressed.

Do you personally think that your sleep affects daily stress?

Questions related to sleep:

Roughly how many hours of sleep do you have per night?

Do you have a regular sleep-wake time schedule?

Questions more related to the sleep-mood relationship:

Have you noticed your mood changing if you haven't had enough sleep at night?

What are your typical moods when you've had a good healthy sleep?

What are your typical moods when you've had a not so good, not healthy sleep?

There was one question that asked for participants' evaluation of the sleep and mood relationship: "Overall based on past experience do you believe that your mood is based on how much sleep you had the night before?"

This question was constructed on a five-point Likert scale: 1=Not at all, 2=Somewhat, 3=Maybe, 4= 5=Yes. The Likert scale ensures that participants are not limited to an either-or option, and are permitted to remain neutral about the question being asked. They can choose from a range of responses leading to a more nuanced perspective of the extent to which they believe that mood is based on how much sleep the participant had the night before.

Infographic

Infographics were chosen for the purposes of this research study in order to have a medium to better communicate directly and highlight important aspects of the findings. It involves the condensation of complex information into a visual medium which then specifies and highlights the key findings. In doing so, it delineates the most significant results of the study. The research process of generating the infographics involve looking through several websites and software and testing before settling on a particular site and software, namely Adobe Create. Through Adobe Create, various infographics were explored. These included word clouds that communicated the common words used in self-reports by the participants.

It was decided that a few infographics would be made to refer to communicating the results to a wider audience. For the purposes of the study, the decision was made to use specific infographics for the most significant or interesting answers in relation to stress, sleep and mood, which highlighted the main key parts of the research paper.

Chapter 4:**Results:-**

The following represents the results from participant surveys and the information to create the infographic and word cloud based on survey results.

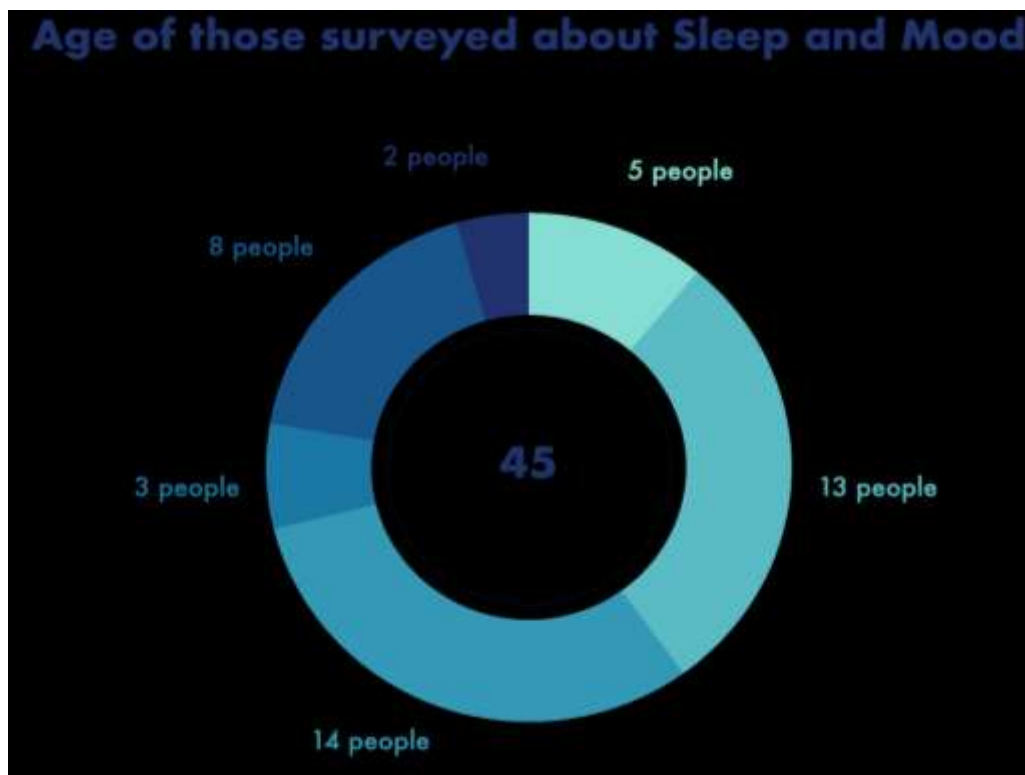
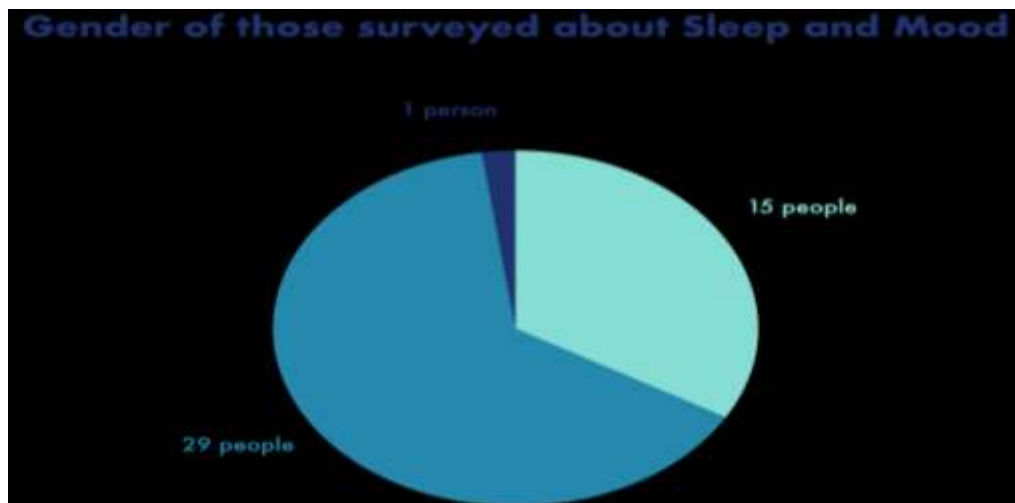
Survey results

The participants in this study were 45 male and female students. A questionnaire, given to the participants, was prepared by the researcher. The survey was distributed to the participants via social media and similar other means.

The age range of the participants of the survey ranged from 14 to 18. While 29 respondents self-reported their gender as female, 15 self-reported their gender as male while one categorized their gender as "other" or chose not to reveal their gender (Fig 1).

Figure 1:- Age and Gender of Responders

The following represent the results of 45 respondents categorized by gender and age.



The data, especially the answers to open-ended types of questions relating to causes of stress in their life, the sensations experienced during moments of stress, and details about the participants' sleep schedules, were sizable. The diversity, complexity, and volume of the results made the task of consolidating the results a challenging one.

At the same time, the data was extremely rich and pregnant with insight with regards to the participants' habits and physical and emotional reactions to stress and their opinions of it, due to the reasons given below. The data analysis revealed the unique aspects of stress and mood which occupied most of the participants' preoccupations in relation to sleep which might have otherwise gone unnoticed. In this study, only the relevant information linking stress with mood and sleep will be identified.

When asked to describe whether they believe that mood is based on how much sleep they'd received in the night before based on past experience, an overwhelming majority agreed with or were neutral to the statement. A further examination of this data reveals that 28 out of 45 respondents (62%) answered that they strongly agreed or agreed with the statement. 10 participants out of 45 responded with the highest value on the Likert scale to this question ("5") while 18 people answered with the next highest value, "4". Out of the 45 respondents, 13 indicated that they were neutral to the statement ("3"). Out of the respondents, only three disagreed or disagreed strongly with the statement. Only one respondent marked it as a 1. A sizable majority also stated that when they had a good and healthy sleep, cheerfulness was one of the moods they experience. The results suggest that people believed in the link between sleep and mood and that people's perception of good and healthy sleep is positively correlated to a happy mood. That is, the more hours of good quality sleep is followed by a positive mood the next day for most people, and most people believe in the sleep-mood relationship.

When questioned about their perception of whether they felt sleep affects daily stress, participants were interestingly divided about the issue. Out of 45 respondents, 22 (48%) said they did not link sleep to daily stress. This amounts to only about half of the total number of respondents. 12 people answered "maybe", while 11 categorically did not perceive that sleep relates to daily stress. These results are extremely intriguing given the results which correlated a good sleep to a positive mood. It seems that despite noticing that they felt cheerful after a good night's sleep, the majority of participants did not necessarily believe that sleep is linked to bad mood or stress in any way. Thus it can be said that while good sleep results in a positive mood, participants' beliefs about the relationship between sleep and stress are less strong. They did not necessarily believe that sleep affects daily stress. One reason for this could be that they are used to their stressful lives as a default. This makes sense given that an overwhelming number of participants (44 out of 45, or 97%) have reported that they experience stress in their lives.

To the question "Have you ever noticed your mood changing if you have not had enough sleep at night?" a large majority responded in the affirmative. Out of 45 respondents, 32 (71%) individuals indicated that they did perceive their mood changing if they did not have enough sleep at night. 11 out of 45 respondents indicated "maybe", while only 2 respondents felt no perceivable change in the mood if they did not sleep at night.

As to whether they have a regular sleep-wake schedule or not, 23 out of 45 (51%) respondents answered that they do have a regular sleep-wake schedule. Asked about the number of hours of daily sleep they 31 out of 45 indicated that they have at least 7 hours of sleep (see Fig 2). For those respondents who claimed they did not have a proper sleep-wake schedule, they cited reasons such as work and their ability to manage their time: "poor time management abilities", "it really depends on how much work i have to do, whether I can sleep or not, or if I have school", "Depends on how busy I am with work". This shows that apart from other factors, work plays a major role in people's inability to maintain sleep-wake schedules (Fig 3).

Figure 2:- Self-report of hours of sleep per night by respondents

The following represent the results of 45 respondents categorized by gender and age.



In response to the question, “What are your typical moods when you've had a not so good, not healthy sleep?” most respondents described having negative moods. These negative moods were mostly related to the state of sadness, such as “Gloomy” and “melancholy”. In fact, 29 out of 45 participants (64%) responded that they felt “gloomy” due to a lack of good quality sleep. Some of the other common responses were “Angry” and “Tense” while certain respondents reported thoughtful or contemplative moods such as “Reflective”. This indicates that there is a correlation between lack of sleep and negative moods. In particular, the relationships between the lack of good quality sleep and sadness are discernible.

World cloud design

The creation of the word cloud commenced by the researcher looking through online resources, before settling on the software, Adobe Create. A word cloud was the best type of infographic for this question specifically considering all the diverse responses. This word cloud shows the reader different types of words and moods many respondents had to say about how they felt when they have had a good healthy sleep. The word cloud as well adds lots of color and design to the research paper, making it the most appropriate medium to communicate the research results effectively to a wide audience.

Figure 3:- Word cloud of self-reports of feelings arising from lack of a healthy sleep.



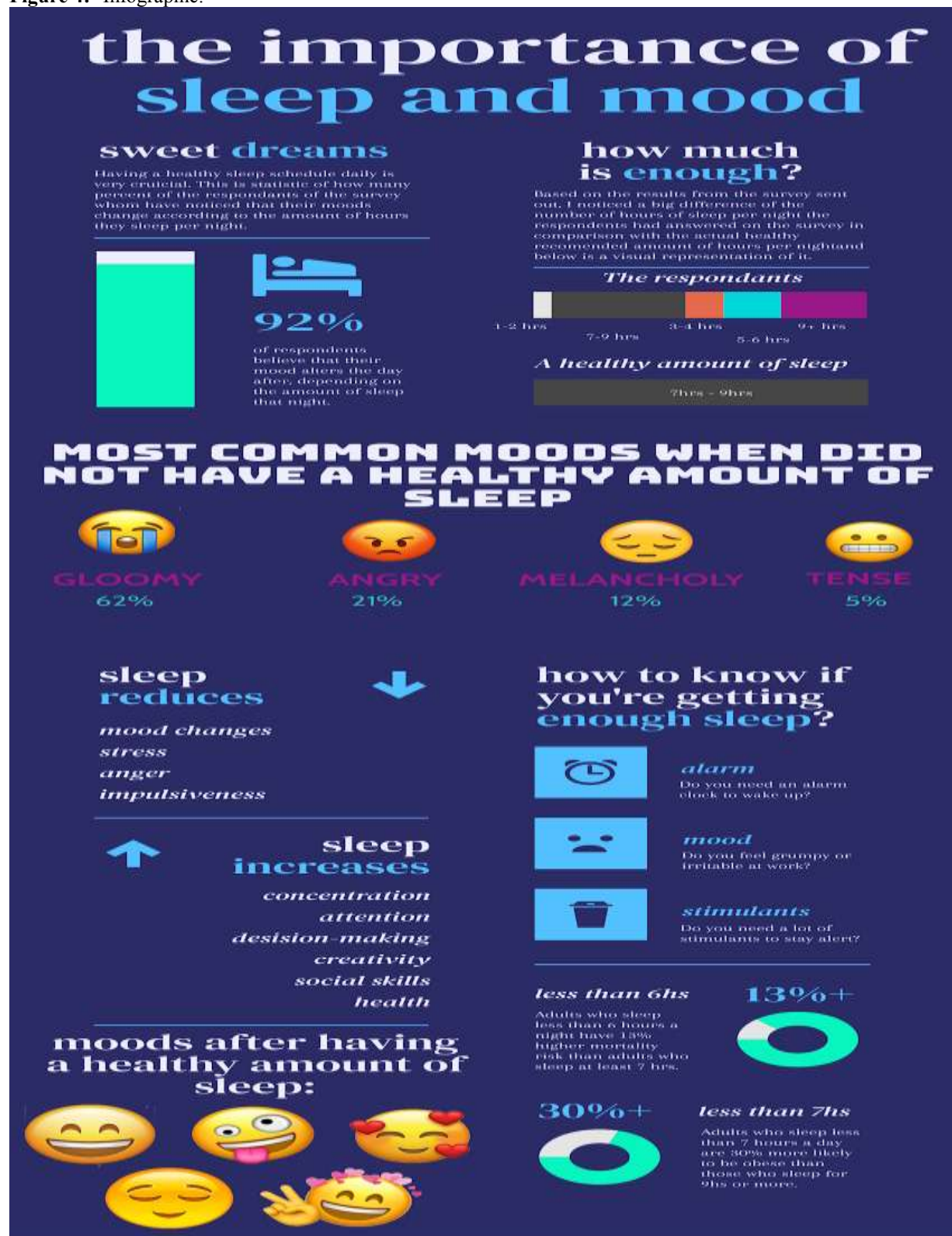
The word cloud visualizes some of the responses to the question, “Describe in a few words the physical, emotional, and social sensations and the feelings you encounter when stressed?” As the word cloud shows, several responses were provided by participants. Some responses were common to some participants, such as physiological responses of having “butterflies” or feeling knots in one’s stomach. One response describes this physiological response: “I feel butterflies in my stomach, bowel pressure in response to stress and knots on the side of my stomach”. Yet another describes the physiological response, as well as an emotional response: “I just get butterfly’s [sic] in my stomach and maybe a little irritable.” Some respondents described an increase in heart rate: “Heart-pounding”. Still, others described more physiological feelings such as “breathlessness”, “neck and back pain” and “slower reflexes.” A section of the respondents described their emotional reactions: “cry”, “depressed”, “get mad easily”, and “anxiety.” These findings suggest that when stressed, participants experience perceivable physiological as well as emotional reactions to the stress (Fig 3).

Infographic design Why did you choose these words and statistics to include?

For this infographic, the main focus was to inform the readers about the importance of sleep, whether it was through statistics, fun facts or even images like emojis to make it relatable and intelligible to a wide audience. Overall all 3 modes were addressed and put into this infographic because of how important the message was to send across. The idea of statistics had already been used in past graphs but fun facts and images like emojis were first introduced in this infographic, for various reasons, the main one being to introduce a change in the infographic section.

Interestingly, there is a relationship between good quality sleep and good mood and this may be stronger than the relationship between poor sleep and a bad mood. 39 out of 45 (86%) reported “Cheerfulness” as a result of good quality sleep. The findings suggest that while good sleep is positively correlated with a good mood, these relationships may be strong that the effect of poor sleep leading to a bad mood such as sadness or depression (Fig 4).

Figure 4:- Infographic.



Chapter 5:**Analysis and Discussion:-**

Following the collation and analysis of the results, several interesting findings emerged resulting in the reification of several studies related to sleep and mood in the context of young people. Some were expected and some were surprising, as will be delineated in the sections below.

Analysis of results

The results suggest that the exigencies of modern day living make conscientizing people to the importance of sleep and mood more important than ever. The end of the 20th Century and the beginning of the 21st marked an era of modernization that formed the background of the effect of human actions on sleep and the related notions of positive and negative mood. While sleep has remained a constant across the ages, from the time of Greek philosophers such as Aristotle, recent research on sleep has increased almost exponentially due in part to hectic modern lives. Researchers such as Horne (1988) demarcate the definitions of sleep, still others tried to establish the relationship of sleep and mood. However, despite the increase in recent research related to sleep, and even mood, few studies have delved deeper into the relationship of sleep and mood in relation to adolescents and young people. This is especially significant given how much young people's moods vary due to factors such as hormonal changes, and so on.

Several of the things learned in this study have very tangible implications for people's regulation and understanding of stress and its relation to sleep and mood. The fact that people report experiencing stress level unforeseen in previous eras and generations cannot be ignored. The findings show that the experience of stress is universal and age is not a barrier to experiencing pressure from various aspects of life, and unpleasant emotions in general. The survey proved the point that no matter how old a person is, they will feel stress at least once in their lifetime.

Furthermore, results of the survey clearly validate the significant role of sleep in every individual's life. The duration of sleep and its undeniable relation to the good or bad quality of sleep cannot be ignored. As sleep is a universal phenomenon, there is a need for it to be taken more seriously for the domino effect it has on various aspects of our lives. This includes not just the cognitive effects of lack of sleep but also the emotional effects of it.

On the basis of the qualitative evidence which indicates that people reported to have perceived links between lack of sleep and negative moods, it is possible to conclude that people might not have seen the relationship or become aware of it. Thus, more efforts need to be made to get people to recognize physiological symptoms of lack of sleep as serious effects. The best way to help people who may not see the relationship between sleep and mood, or who are clueless about what to do or where to get help, is by engaging them and educating them to implement strategies such as a sleep-wake schedule. This schedule should not be sacrificed by our modern-day concerns such as working too hard or unnecessarily.

The evidence suggests that good mood is positively correlated with a longer duration of sleep in most of the respondents. These results may be used to convince people of the need to actively strive to sleep longer to live a mentally healthy and even enriching life.

The young people involved in the study have demonstrated awareness that they are still learning to manage their moods, as compared to adults, who might already become familiar with their mood patterns and may have learned mood management.

Ever since their youth, young people become familiarized with the psychological dimensions of sleep and mood. Aspects of sleep, mood, and everything related to the human mind, behavior, and emotions have been taught to generations in various ways over time, whether by parents or even health teachers and society. Being brought up in a generation where sleep is so important to teenagers impacts young people to a great extent. This study contributes to the ongoing investigation of the topic of sleep but from a systematic approach as opposed to word-of-mouth or common sense ideas of the concepts.

This topic is significant as it is very relevant to the current generation of young people and the concerns that are prevalent among the participants of the study. Teenagers quickly learn that sleep is extremely important, constituting about a third of human life. This study hopefully shares the knowledge with fellow members of the community who will be looking for evidence-based research related to sleep.

This study aimed to explore in detail through reading and research, how exactly sleep and mood are related. To do this, the study aimed to identify the relationship between sleep and mood through a survey given to young adults and teenagers. The study also aimed to identify and disseminate the outcome/findings of this project (research paper) to all the teenagers of a school so that they are aware of how important and crucial sleep is and how it affects mood on a daily basis.

The findings here suggest that according to the evidence, sleep and mood are related inextricably. Good moods are associated with full sleep, while negative moods are associated with a lack of sleep. Sleeping more in order to maintain a good mood may not be sufficient to effect change. People should actively avoid having too little sleep by recognizing its link to their mood and effects on them. In circumstances such as poor work-life balance, people are constrained from placing sleep as their priority and therefore also managing their mood. People of all ages need to be cognizant of the realities of the situation and the extremely important links between sleep and mood.

Recommendations:-

Based on the results discussed, further studies need to be done to confirm the relationship of sleep and mood in young adults in various areas around the world. Further research could look at the impact of contextual factors such as location, culture, gender and so on. Mindfulness is another area that could be explored in relation to sleep and mood. Best practices involve people, especially young people, using various methods such as mindfulness practices and meditation to reduce their stress levels or even become more aware of their sleep, sleep-wake schedule and moods. At a personal level, people could keep diaries or journals to remind themselves of their sleep-wake schedule and clock in their sleep hours as well as note down the ways in which their mood corresponds to their sleep. Institutionally, organizations could introduce workshops on sleep and mood to raise participants' awareness of the issues involved. These would lead to greater knowledge among the general public as well as researchers on the link between sleep and mood in the context of various people, including young adults.

Chapter 6:

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Appendices

Appendix 1 : Survey information

Thank you for taking the time to participate in my research survey to explore how sleep is linked with mood. I am a student and very much appreciate your help with my research. The survey will take approximately 5-8 minutes and is entirely anonymous. The questions are as follows:

- 1) What is your age?
- 2) What is your current grade level?
- 3) What is your gender?
- 4) Have you ever felt stress?
- 5) What are the usual causes of stress in your life? Please list your top three causes of stress?
- 6) Describe in a few words the physical, emotional, and social sensations and the feelings you encounter when stressed.
- 7) Do you personally think that your sleep affects daily stress?
- 8) Roughly how many hours of sleep do you have per night?
- 9) Do you have a regular sleep-wake time schedule? If not, please explain why not
- 10) Have you noticed your mood changing if you haven't had enough sleep at night?
- 11) What are your typical moods when you've had a good healthy sleep? Check all that apply
- 12) What are your typical moods when you've had a not so good, not healthy sleep? Check all that apply
- 13) Overall based on past experience do you believe that your mood is based on how much sleep you had the night before?
 - 1 - Strongly disagree
 - 2 - Disagree
 - 3 - Neutral
 - 4 - Agree
 - 5 - Strongly agree

Appendix 2 : Raw data from the survey

The following are the raw data from the survey. Since the data is too vast to include as a whole owing to the large sample size, it has been broken down into five parts as follows. The information below is divided into roughly 10 participants per part.

Part 1 (Participants 1-10)

a) Questions 1-4

Participant number	What is your age?	What is your current grade level?	What is your gender?	Have you ever felt stress?
1	15	9	Female	Yes
2	15	10	female	Yes
3	15	10	Female	Yes

4	16	11	Female	Yes
5	16	11	Male	Yes
6	18	University	Female	Yes
7	15	9	Male	Yes
8	16	10	Female	Yes
9	17	12	Male	Yes
10	17	11	Male	Yes

Questions 5 to 8

Participant number	What are the usual causes of stress in your life? Please list your top three causes of stress?	Describe in a few words the physical, emotional, and social sensations and the feelings you encounter when stressed.	Do you personally think that your sleep affects daily stress?	Roughly how many hours of sleep do you have per night?
1	School family homework	Sad angry hungry	Yes	2
2	parents friends school	Very tired and sad	Yes	none-9
3	Studies, Social media and self insecurity	Sadness and anger	Maybe	8-10
4	family, school, social life	headache, anxious, nervous	Maybe	7-8
5	Overload of hw. Or lots of exams	internal pain and feel a bit moody	Maybe	8 hours 30 mins
6	Time management	Scratching myself, crying, breakouts	Yes	6
7	School, social life, family life	Inability to focus, dizzy, angry sometimes	Maybe	8
8	School social life and sport	Just a lot of thoughts	Yes	7-8
9	Procrastinating. That's it	I just get butterflies in my stomach and maybe a little irritable	No	7
10	My grades, the college search.	Anxious, nervous, and, I mean ... stressed.	No	It ranges from 2 to 8.

b) Questions 9 to 13

Participant number	Do you have a regular sleep-wake time schedule? If not, please explain why not	Have you noticed your mood changing if you haven't had enough sleep at night?	What are your typical moods when you've had a good healthy sleep? Check all that apply	What are your typical moods when you've had a not so good, not healthy sleep? Check all that apply	Overall based on past experience do you believe that your mood is based on how much sleep you had the night before?
1	No	Yes	Cheerfulness,	Gloomy, Angry,	5

			Reflective, Gloomy, Humorous, Melancholy, Idyllic, Whimsical, Romantic, Mysterious, Ominous, Calm, Lighthearted, Hopeful, Risk taking	Fearful, Tense	
2	nope,i sleep at 3am and wake up at 1pm everyday	Yes	Melancholy, Calm, Hopeful	Gloomy, Angry, Fearful, Tense, Lonely	5
3	no because i can't sleep till 6 am	Yes	Cheerfulness, Humorous, Calm, Lighthearted, Hopeful, Risk taking	Gloomy, Mysterious, Ominous, Tense, Risk taking	3
4	yes	Yes	Cheerfulness, Reflective, Calm, Lighthearted, Hopeful	Gloomy, Tense	4
5	11:30 to 8	Maybe	Cheerfulness, Reflective, Calm	Lonely	3
6	No because of quarantine	Yes	Cheerfulness, Humorous, Hopeful	Angry, Tense	4
7	Yes	Yes	Reflective, Calm, Lighthearted, Hopeful, Risk taking	Gloomy, Angry, Tense	4
8	Yes it varies over time and quarantine	Yes	Cheerfulness, Reflective, Gloomy, Humorous	Tense	4
9	Yes I do	Maybe	Cheerfulness, Humorous, Calm, Hopeful	Gloomy, Mysterious, Tense	4
10	Because I have poor time management abilities.	No	Cheerfulness, Reflective, Gloomy, Humorous,	Cheerfulness, Reflective, Gloomy, Humorous,	2

			Melancholy, Idyllic, Whimsical, Calm, Lighthearted, Hopeful, Angry, Fearful, Tense, Lonely, Risk taking, Cognition	Melancholy, Idyllic, Whimsical, Calm, Lighthearted, Hopeful, Angry, Fearful, Tense, Lonely, Risk taking, Cognition	
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Part 2 (Participants 11-20)

a) Questions 1 to 4

Participant number	What is your age?	What is your current grade level?	What is your gender?	Have you ever felt stress?
11	15	11	Female	Yes
12	16	12	Male	Yes
13	15	10	Female	Yes
14	15	10	Female	Yes
15	18	12	Female	Yes
16	18	12	Female	Yes
17	17	12	Female	Yes
18	15	9	Male	Yes
19	18	12	Male	Yes

b) Questions 5 to 8

Participant number	What are the usual causes of stress in your life? Please list your top three causes of stress?	Describe in a few words the physical, emotional, and social sensations and the feelings you encounter when stressed.	Do you personally think that your sleep affects daily stress?	Roughly how many hours of sleep do you have per night?
11	school social life	headache, unable to sleep, anxious	Yes	4
12	1. The end of every human's life is certain and written. 2. A family member in great peril/in a srs medical condition. 3. Fortnite.	Sad mad moody	Yes	1
13	Grades, homework, music practice	Annoyed, anxious, getting mad easily	Maybe	6-7
14	family, self-inflicted pressure, school	anxiety, inability to focus, often get sick	Yes	4-5
15	School, body image	Headache, throat tightens, irritability	Yes	6

16	Covid	Just a fleeting thought which goes away	No	8 hrs
17	Work Pressure, Family Dynamics	I feel butterflies in my stomach, bowel pressure in response to stress and knots on the side of my stomach.	Yes	7-8 hours
18	Parents Homework Other stuff	Headache General unhappiness	No	Eight or nine
19	1. Not being able to fit in with friends 2. School workload 3. Not being able to please my parents	Mainly guilt and disappointment that I can't live up to the expectations of the people around me or be more accomplished than others in my circle.	Maybe	Usually 7.5 hours on average

c) Questions 9 to 13

Participant number	Do you have a regular sleep-wake time schedule? If not, please explain why not	Have you noticed your mood changing if you haven't had enough sleep at night?	What are your typical moods when you've had a good healthy sleep? Check all that apply	What are your typical moods when you've had a not so good, not healthy sleep? Check all that apply	Overall based on past experience do you believe that your mood is based on how much sleep you had the night before?
11	nope because i do all my work at night (procrastinate)	Yes	Cheerfulness, Humorous, Whimsical, Hopeful, Risk taking	Gloomy, Melancholy, Mysterious, Ominous, Lighthearted, Angry, Fearful, Tense	5
12	Nope, hardly get sleep	Yes	Cheerfulness, Reflective, Gloomy, Humorous, Melancholy, Idyllic, Whimsical, Romantic, Mysterious, Ominous, Calm, Lighthearted,	Cheerfulness, Reflective, Gloomy, Humorous, Melancholy, Idyllic, Whimsical, Romantic, Mysterious, Ominous, Calm, Lighthearted,	5

			Hopeful, Angry, Fearful, Tense, Lonely, Risk taking, Cognition	Hopeful, Angry, Fearful, Tense, Lonely, Risk taking, Cognition	
13	Yes somewhat	Maybe	Cheerfulness, Humorous, Lighthearted, Hopeful	Gloomy, Angry, Tense	5
14	no, it really depends on how much work i have to do, whether i can sleep or not, or if i have school	Yes	Calm	Gloomy, Tense	4
15	No because I'm staying at home right now	Yes	Cheerfulness, Reflective, Calm, Hopeful	Gloomy, Calm, Risk taking	2
16	Yes	Yes	Cheerfulness, Calm, Lighthearted, Hopeful	Gloomy	4
17	Yes	Yes	Cheerfulness, Reflective, Humorous, Idyllic, Romantic, Calm, Lighthearted, Hopeful, Risk taking, Cognition	Gloomy, Melancholy, Ominous, Angry, Fearful, Tense, Lonely	5
18	Nope I'm spontaneous I guess	Yes	Cheerfulness, Gloomy	Cheerfulness, Gloomy	1
19	Sleep 10:30 , wake up 5:30	Yes	Cheerfulness, Humorous, Idyllic, Calm, Lighthearted, Hopeful, Risk taking	Melancholy, Fearful, Tense, Lonely	4

Part 3 (Participants 21-30)

a) Questions 1 to 4

Participant number	What is your age?	What is your current grade level?	What is your gender?	Have you ever felt stress?
20	17	11	Female	Yes
21	14	10	Female	Yes

22	16	11	Non-binary	Yes
23	16	12	Female	Yes
24	19	university	Female	Yes
25	14	9	Female	Yes
26	16	12	Female	Yes
27	17	12	Male	Yes
28	16	11	Male	Yes
29	18	12	Female	Yes

b) Questions 5 to 8

Participant number	What are the usual causes of stress in your life? Please list your top three causes of stress?	Describe in a few words the physical, emotional, and social sensations and the feelings you encounter when stressed.	Do you personally think that your sleep affects daily stress?	Roughly how many hours of sleep do you have per night?
21	Work related, friends related, not getting what I want	Depressed, agitated, withdrawn	Maybe	7 hours
22	Sitting home . Not going to school . Not meeting friends	Sad, confused, guilt	No	8 hours
23	Overwhelm from workload, procrastination, lack of time management and organization	Exhaustion, slower reflexes, startled easily, shoulder pain, zoning out, short term memory gets weaker, spend a lot of time reminiscing, emotional distancing (both intentional and not), gets tired easily but doesn't sleep easily, disturbed sleep.	No	6-7
24	Studies, Exams, Completing notes	When I'm stressed I start crying then think about solutions to release my stress. I listen to music or take a walk then find solutions to my problems	Maybe	5
25	studying, social, exams	agitated, extra hungry, upset	Yes	8
26	school work, studying, social life	nervous, irritated	Yes	around 7-8
27	Academic, College Admissions + Process, Parental	Heart pounding, unable to sleep, unable to focus, feeling like I'm running out of time.	Yes	School Day: 5/6. Other: 7-9.
28	Academic Deadlines (Homework, Projects, etc.), Sporting performance (The pressure to perform at a certain expectation during games.) , Less sleep	It results in me feeling really tired and lethargic. I am also very moody as a result of my stress, with my emotions fluctuating from happy to sad at the drop of a hat.	Yes	7 hours
29	Exams, cricket match	Headache	Yes	8
30	Relationships (friends/	Cry, Heavy head/ headache, Tired,	Maybe	8-10

	family/ boyfriend), School	Drained, Exhausted, Not motivated, Distracted		
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c) Questions 9 to 13

Participant number	Do you have a regular sleep-wake time schedule? If not, please explain why not	Have you noticed your mood changing if you haven't had enough sleep at night?	What are your typical moods when you've had a good healthy sleep? Check all that apply	What are your typical moods when you've had a not so good, not healthy sleep? Check all that apply	Overall based on past experience do you believe that your mood is based on how much sleep you had the night before?
21	Mostly regular. On weekends I watch movies or TV shows	Yes	Cheerfulness, Calm, Hopeful	Gloomy	3
22	No	Yes	Cheerfulness, Humorous, Lighthearted, Hopeful	Angry, Lonely	3
23	I go to sleep whenever I feel my day's work is done, which varies, but I always aim to get up at the same time everyday (usually 8 am)	Maybe	Reflective, Idyllic, Whimsical, Calm, Hopeful	Reflective, Gloomy, Ominous, Angry, Tense, Lonely	4
24	No I used to get up at 12 when we had school. During online classes I woke up at 6:30-7:00 Now I wake up at 8 in the morning. On Saturdays I wake up by 10-10:30	Maybe	Cheerfulness, Reflective, Humorous, Romantic, Calm, Hopeful, Lonely, Risk taking, Cognition	Gloomy, Mysterious, Lighthearted, Angry, Fearful, Tense, Lonely	3
25	Yes	Yes	Cheerfulness, Calm, Lighthearted	Gloomy, Angry, Tense	4
26	no because of the different school and	Maybe	Cheerfulness, Calm	Gloomy, Angry, Tense	4

	weekend timings				
27	No. Depending on how hectic my schedule is that week, just recently midnight AP exams, off-weeks etc.	Yes	Cheerfulness, Lighthearted, Cognition	Reflective, Angry, Tense, Cognition	3
28	Yes.	Yes	Cheerfulness, Humorous, Romantic, Calm, Lighthearted, Hopeful, Risk taking	Gloomy, Melancholy, Tense	4
29	Regular	Yes	Cheerfulness, Humorous, Calm, Lighthearted	Gloomy, Angry	4
30	It's holidays and we don't have school but usually sleep before 2 and wake up before 11:30	Yes	Cheerfulness, Calm, Lighthearted	Angry, Tense	4

Part 4 (Participants 31-40)**a) Questions 1 to 4**

Participant number	What is your age?	What is your current grade level?	What is your gender?	Have you ever felt stress?
30	18	12 but graduated	Female	Yes
31	19	College Freshman	Female	Yes
32	18	12	Female	Yes
33	13	9th	Female	Yes
34	14	Class 10	Female	Yes
35	14	Class 10	Female	Yes
36	17	Junior in College	Male	Yes
37	16	12	Female	Yes
38	14	Class 10th	Female	Yes
39	19	Graduate	Male	No

b) Questions 5 to 8

Participant number	What are the usual causes of stress in your life? Please list your top three causes of stress?	Describe in a few words the physical, emotional, and social sensations and the feelings you encounter when stressed.	Do you personally think that your sleep affects daily stress?	Roughly how many hours of sleep do you have per night?

31	Relationships (friends/ family/ boyfriend), School	Cry, Heavy head/ headache, Tired, Drained, Exhausted, Not motivated, Distracted	Maybe	8-10
32	Exams, assignments, relationship	Anxious, nervous	Yes	6-7
33	Social anxiety, Stress about grades, Stress about time	Breathlessness	Yes	6-7
34	Sometimes too much school work, being too busy and excessive thinking.	When I feel stressed it causes me a lack of sleep, or maybe sometimes I don't feel like eating.	Yes	6 hours
35	Exam	Frustration, anger	No	6-7 hours
36	Exam	Panic , frustrations	Maybe	7
37	School, Job Interviews	Panic, scared	Yes	6
38	Academic College Admissions + Process Parental	Heart pounding, unable to sleep, unable to focus, feeling like I'm running out of time.	Yes	School Day: 5/6. Other: 7-9.
39	Sitting home . Not going to school . Not meeting friends	Lack of sleep	No	8 hours
40	School work, family	Headaches	Maybe	7

c) Questions 9 to 13

Participant number	Do you have a regular sleep-wake time schedule? If not, please explain why not	Have you noticed your mood changing if you haven't had enough sleep at night?	What are your typical moods when you've had a good healthy sleep? Check all that apply	What are your typical moods when you've had a not so good, not healthy sleep? Check all that apply	Overall based on past experience do you believe that your mood is based on how much sleep you had the night before?
31	It's holidays and we don't have school but usually sleep before 2 and wake up before 11:30	Yes	Cheerfulness, Calm, Lighthearted	Angry, Tense	4
32	Yes	Maybe	Cheerfulness, Reflective, Humorous, Tense, Cognition	Cheerfulness, Reflective, Humorous, Fearful, Tense	4
33	No, Depends on how busy I am with work	Yes	Cheerfulness, Humorous, Lighthearted	Gloomy, Melancholy, Angry, Tense	5
34	No, I don't have a regular sleep-wake	Yes	Cheerfulness, Humorous,	Gloomy, Angry, Fearful, Tense,	5

	time schedule as it depends at which time I slept at night.		Mysterious, Calm, Lighthearted, Hopeful	Lonely	
35	Yes	No	Calm, Hopeful	Tense	2
36	Yes, regular	Yes	Idyllic, Calm, Lighthearted	Tense	3
37	No, because some days I have more work than others	Yes	Cheerfulness, Calm, Cognition	Reflective, Melancholy, Tense	3
38	No. Depending on how hectic my schedule is that week, just recently midnight AP exams, off-weeks etc.	Yes	Cheerfulness, Lighthearted, Cognition	Reflective, Angry, Tense, Cognition	3
39	No	Yes	Cheerfulness, Humorous, Lighthearted, Hopeful	Angry, Lonely	3
40	Yes	Yes	Cheerfulness, Reflective, Humorous, Calm, Lighthearted, Hopeful	Gloomy, Angry, Tense	5

Part 5 (Participants 41-49)

a) Questions 1 to 4

Participant Number	What is your age?	What is your current grade level?	What is your gender?	Have you ever felt stress?
40	18	12	Female	Yes
41	16	11	Male	Yes
42	16	11	Male	Yes
43	16	11	Male	Yes
44	16	11	Male	Yes
45	19	College Freshman	Female	Yes
46	19	Junior in College	Male	Yes
47	19	Sophomore in college	Male	Yes
48	14	10	Female	Yes

b) Questions 5 to 8

Participant number	What are the usual causes of stress in your life? Please list your top three causes of stress?	Describe in a few words the physical, emotional, and social sensations and the feelings you encounter when stressed.	Do you personally think that your sleep affects daily stress?	Roughly how many hours of sleep do you have per night?
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41	Social anxiety Stress about grades Stress about time	Breathlessness	Yes	6-7
42	Tests, Social Pressures, Too much work	Neck and Back Pain as well as fatigue	No	8
43	Tests, Social Pressures, Too much work	Neck and Back Pain as well as fatigue	No	8
44	Tests, Social Pressures, Too much work	Neck and Back Pain as well as fatigue	No	8
45	Exams, cricket match	Headache	Yes	8
46	Exams, assignments, relationship	Anxious, nervous	Yes	6-7
47	School, Job Interviews	Fatigue, nervousness	Yes	6
48	Job recruiting, classes, social life	Anger, confusion moody	Yes	7
49	Sitting home . Not going to school . Not meeting friends	Mad, sad, confused	No	8 hours

c) Questions 9 to 13

Participant Number	Do you have a regular sleep- wake time schedule? If not, please explain why not	Have you noticed your mood changing if you haven't had enough sleep at night?	What are your typical moods when you've had a good healthy sleep? Check all that apply	What are your typical moods when you've had a not so good, not healthy sleep? Check all that apply	Overall based on past experience do you believe that your mood is based on how much sleep you had the night before?
41	No, Depends on how busy I am with work	Yes	Cheerfulness, Humorous, Lighthearted	Gloomy, Melancholy, Angry, Tense	5
42	Yes	Maybe	Cheerfulness, Reflective, Gloomy, Humorous, Lighthearted, Angry, Tense	Cheerfulness, Reflective, Gloomy, Humorous, Melancholy, Lighthearted, Hopeful, Angry, Fearful, Tense	3
43	Yes	Maybe	Cheerfulness, Reflective, Gloomy, Humorous, Lighthearted, Angry, Tense	Cheerfulness, Reflective, Gloomy, Humorous, Melancholy, Lighthearted, Hopeful, Angry, Fearful, Tense	3
44	Yes	Maybe	Cheerfulness,	Cheerfulness,	3

			Reflective, Gloomy, Humorous, Lighthearted, Angry, Tense	Reflective, Gloomy, Humorous, Melancholy, Lighthearted, Hopeful, Angry, Fearful, Tense	
45	Regulars	Yes	Cheerfulness, Humorous, Calm, Lighthearted	Gloomy, Angry	4
46	Yes	Maybe	Cheerfulness, Reflective, Humorous, Tense, Cognition	Cheerfulness, Reflective, Humorous, Fearful, Tense	4
47	No, because some days I have more work than others	Yes	Cheerfulness, Calm, Cognition	Reflective, Melancholy, Tense	3
48	No, I sleep in the day and work at night	Yes	Cheerfulness, Reflective, Humorous, Melancholy, Romantic, Calm, Lighthearted	Gloomy, Angry, Tense	5
49	No	Yes	Cheerfulness, Humorous, Lighthearted, Hopeful	Angry, Lonely	3

Appendix 3 : Infographic



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Biography

Ashrita Sujana has always been interested in the field of psychological research because since a young age, she has been fascinated with how the human brain and behaviour work. She hopes to be able to pursue further studies and possibly a career in psychological research in the future.