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Research Paper

Exploring the Interplay Between Screen Time, Sleep Quality, and Anxiety in Young Adults

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ABSTRACT

The study aims to investigate the relationship between Screen Time and sleep quality, anxiety in young adults aged 18-25. My study addresses the research by examining anxiety's influence on the relationship between Screen Time and sleep quality, thereby providing a more comprehensive understanding of these interactions. The generality of Screen Time among 18–25-year-olds have highlighted concerns in recent years regarding its potential impact on sleep quality.169 adults aged between 18 to 25 selected from a variety of backgrounds make up the study sample, providing a varied coverage. Self-reported questionnaires on Screen Time, anxiety, quality of sleep questionnaires are completed by the participants. In order to investigate the associations between these variables and to prove the hypothesis that anxiety significantly mediates the impact of Internet time and sleep quality, correlational analysis was used. Increased anxiety is correlated with increased Screen Time, and this has a detrimental effect on the sleep quality. These results demonstrate the crucial role that anxiety plays in the dynamic among these two variables, and they imply that treatments targeted at lowering anxiety may lessen the negative impact of Screen Time on quality of sleep. In summary, this study highlights the significance of treating anxiety in attempts to enhance the quality of sleep for young adults who spend a lot of time on screen.

Keywords: *Screen Time, Sleep quality, Anxiety, Young adults, Relationship*

In recent years, the pervasive presence of digital screens in young adults' lives has increased study related to its potential impact on various aspects of their health and well-being. Among these concerns, the relationship between Screen Time and sleep quality has garnered significant attention. Concurrently, anxiety levels are on the rise, further complicating the understanding of factors influencing sleep quality in this population. Therefore, exploring the intricate interplay between Screen Time, sleep quality, and anxiety essential or comprehensively understanding and addressing adolescent well-being. This study seeks to investigate the mediating role of anxiety in the relationship between Screen Time and sleep quality in young adults. By elucidating this potential mechanism, we aim to provide valuable insights into the complex dynamics influencing adults' sleep patterns and psychological health outcomes in the digital age. Through a comprehensive examination of these factors, we endeavor to inform interventions and strategies aimed at promoting healthy

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screen habits and improving sleep quality among adults, ultimately enhancing their overall well-being and quality of life.

Background and Context

In contemporary society, adolescents are increasingly engaged in screen-based activities, including social media interactions, gaming, and streaming entertainment. Concerns about the potential impact of excessive Screen Time on adolescent sleep quality have gained attention because of the crucial part of sleep in physical health, cognitive function, and emotional well-being during this developmental stage. However, the relationship between Screen Time and sleep quality in adolescents is multifaceted and complex. One aspect worth investigating is the facilitating role of anxiety. Young Adults is characterized by heightened vulnerability to anxiety disorders, and research has connected increased internet time to increased levels of anxiety among young adults. Understanding how anxiety mediates the relationship between Screen Time and sleep quality is vital for developing targeted interventions to promote healthy sleep habits and mental well-being in this demographic. This research aims to delve into the interplay between Screen Time, anxiety, and sleep quality in adolescents, shedding light on fundamental aspects that may impact sleep patterns. By examining the moderating function of anxiety, this study seeks to inform strategies to mitigate the adverse impact of Screen Time among adolescent sleep and mental health, ultimately contributing to the promotion of overall well-being in this vulnerable population.

Operational information of Variables

Screen Time:

The overall hours invested using screens on computers, tablets, televisions, and smartphones is referred to Screen Time. Through self-reported surveys, study participants record the minimum amount of time they spend using screens each day. Hours spent on social media platforms, videos, streaming, and other digital activities are included in this. The data can be analyzed to see how different Screen Time durations may affect these variables. The data is divided into different levels of screen usage. It is essential to comprehend Screen Time as a variable because it facilitates the identification of particular digital activities that may exacerbate sleep difficulties in young adults.

Screen Time is typically divided into several categories:

- Passive Screen Time: When a person watches TV or watches a video, they are consuming content passively.
- Active Screen Time: Interactive, user-participated activities that involve the use of social media or video games.

The term “educational Screen Time” refers to the use of screens for research, online learning, and educational applications.

- Recreational Screen Time: The use of screens for entertainment purposes, including social media or video games.

One area of special interest is the connection between screen usage and sleep. Screen blue light can inhibit melatonin production, postponing the onset of sleep and lowering the quality of that sleep. Participating in stimulating activities like social media or gaming can also raise arousal and make it harder to unwind before bed. Lack of sleep can come from

this, and lack of sleep has detrimental effects on one's mental health, ability to learn, and general well-being.

Sleep quality

The subjective assessment of one's sleep, duration, latency, disruptions, and general restfulness, is known as sleep quality. PSQI, a popular standardized questionnaire, is utilized in this study to assess the level of quality of sleep. The PSQI assesses a number of sleep-related factors of the past month, such as the total number of hours slept, the frequency of disruptions, and the perception of sleep quality. The complex character of young adults' sleep health is reflected in the PSQI, the higher values indicate low quality sleep. This measure offers a thorough evaluation that goes beyond just measuring the amount of sleep by concentrating on several aspects of sleep. A poor quality of sleep can have a lot of detrimental repercussions. On a physical level, it might result in exhaustion, compromised immunity, and heightened vulnerability to diseases. It may mentally impede cognitive processes like memory, focus, and judgment. Insufficient sleep is connected psychologically to mood fluctuations, irritability, and elevated stress levels. Chronic sleep related issues raise the chance of acquiring anxiety, depression, and cardiovascular disease over time.

Adopting good sleep hygiene routines is necessary for increasing your sleep. Crucial measures include minimizing Screen Time before bed, maintaining a comfortable sleep environment, and establishing a consistent sleep pattern. Deep breathing exercises and other relaxation methods can also aid in lowering stress and enhancing sleep. Furthermore, maintaining a cold, dark, and quiet sleeping environment can improve the depth and continuity of sleep.

Anxiety

In this research, anxiety is defined as concern, uneasiness, or discomfort that could get in the way of day-to-day activities. The Generalized Anxiety Disorder-7 scale, a validated self-report questionnaire intended to gauge the intensity of anxiety symptoms, is used to measure it. Anxiety levels can be classified as minimal, mild, moderate, or severe using the GAD-7 score, which makes it easier to identify people who are more related to anxiety-related sleep disruptions. The findings are helpful in developing therapies that target anxiety reduction and enhance the general well-being of young adults.

Relevance and Importance

1. Young adults Mental Health: young adults are in a critical period marked by heightened vulnerability to psychological problems, disorders like anxiety. Increased time spent on screen has been linked to increased anxiety levels in young adults, which, in turn, can adversely affect sleep quality. By investigating the mediating role of anxiety, our research gives knowledge on Screen Time influences psychological health outcomes and sleep patterns in this vulnerable population.
2. Public Health Implications: Poor sleep quality and psychological health issues in adolescence have long-term implications for physical health, academic performance, and overall well-being. Identifying the mechanisms through which sleep is impacted by Screen Time, anxiety aimed at promoting healthier screen habits and improving sleep hygiene among adolescents, ultimately decreasing the problem of psychological disorders in this demographic.
3. Parental Guidance and Education: Parents have an important role in regulating adolescents' Screen Time, promoting healthy sleep habits. Understanding the relationship between Screen Time, anxiety, and sleep quality can empower parents

with knowledge to make informed decisions regarding screen use and implement strategies to support their adolescents' mental and physical health.

4. Educational Settings: Schools and institutes will also get insight through research findings by incorporating evidence-based strategies to address Screen Time-related concerns and promote better sleep quality among students. Educators can integrate discussions on the importance of balanced time spent on screen and psychological health awareness into school curricula, fostering a supportive environment for adolescent well-being. In essence, this research topic contributes new insights into the complex interplay among Screen Time, anxiety, and quality of sleep-in adolescents. By uncovering the mediating role of anxiety, this research gives insight that is relevant to parents, educators, healthcare professionals, policymakers, and adolescents themselves. Ultimately, this research is worth pursuing for enhancing psychological health and well-being.

REVIEW OF LITERATURE

Reviewing the existing literature on a specific topic is essential for several compelling reasons, particularly when examining a complex issue like anxiety, Screen Time and quality of sleep which are most common these days.

Some of the reasons are listed below:

- Knowledge Foundation: A comprehensive literature review establishes a solid knowledge foundation. It helps to understand the current state of knowledge, what has been explored, and what gaps are present in previous studies.
- Identifying Gaps: Reviewing the existing literature, identify the research gaps in existing research and areas where further investigation is needed. This also helped to frame research questions and objectives, ensuring that the study addresses pertinent issues and contributes meaningfully to the field.
- Avoiding Redundancy: The literature review helps prevent redundancy by ensuring that the proposed research is not merely about the previous works.
- Methodological Insights: While reviewing the research paper and the methodologies used within it, help to structure methodology and measurement tools.
- Ethical Considerations: Understanding prior research in this area helped in ethical considerations. Past studies about potential risks and sensitivities associated with this topic enabled to conduct this research with greater sensitivity and ethical rigor.

Some of the existing literature which is related to heading are given below.

Yap, A. U., Dewi, N. L., & Marpaung, C. (2024) made research to find the comorbidity between somatization and temporomandibular disorders (TMD) in young adults are examined in this study, along with correlations with personality traits, affective disorders, and sleep quality. The data assessed somatization, personality, emotional health, and sleep problems in individuals with TMD diagnoses. Results point to strong relationships between high somatization levels and TMD, with neuroticism and poor emotional control acting as mediator factors in these relationships. There was also a high prevalence of sleep difficulties, suggesting a complex relationship between TMD, personality, and mental health.

Xiong, N. (2023) examined the influence of overall Screen Time on psychological health in a diverse population is investigated in this PhD dissertation. Adults of all ages were included in the sample, and the goal was to find links in Screen Time and psychological health

outcomes like stress, anxiety, and depression. Surveys were employed in the study to gather information on screen usage and mental health. Results show a clear correlation between increasing screen usage, anxiety symptoms, especially among younger people. The results supported the hypothesis that more Screen Time had a detrimental impact on mental health, highlighting the importance of moderation in screen usage.

Pascal, R., et al. (2023) investigated the connection between pregnant women's quality of sleep, anxiety, stress, and overall, well-being throughout the gestational period. Pregnant women in varying phases of their pregnancies made up the sample. Self-reported questionnaires measuring stress, anxiety, general well-being, and sleep patterns help in gathering data. This finding implies that higher ranges of stress and anxiety have a detrimental effect on a mother's general health and quality of sleep, with notable variations during the course of pregnancy. The results of the study confirmed the hypothesis that psychological health problems get worse as the pregnancy goes on, emphasizing the significance of keeping an eye on pregnant women's mental health.

AlQaderi, N., et al. (2023) worked on the topic phone addiction. cyberbullying and mental health in UAE. This cross-sectional study investigates the relationship between phone addiction, cyberbullying, and psychological health among young adults in the United Arab Emirates. They participated in an online survey assessing phone usage, experiences of cyberbullying, and psychological health status. Research shows increased levels of phone addiction correlate with increased experiences of cyberbullying and low psychological health, like anxiety and depression. The hypothesis tested was that phone addiction and cyberbullying are significant predictors of psychological health issues in this population, and the results confirmed these associations.

Galang, C. M. D. L. (n.d.) made research on the topic Fear of Missing Out (FOMO) tendencies on social media among working young adults. Using a sample of employed young adults, the study utilized surveys to measure FOMO levels, internet usage, and its impact on psychological health and work-life balance. The findings reveal that higher FOMO scores are linked to increased social media engagement and negatively affect mental health, contributing to stress and anxiety. The hypothesis tested was that FOMO is a relevant predictor of mobile usage patterns and associated psychological health issues, according to the data of FOMO in the digital age.

He, Z. F., Tan, W.Y., Ma, H., Shuai, Y., Shan, Z., Zhai, J., ... & Liu, Y. (2024) conducted a cross-sectional study conducted on older adults in Guangdong province, China, sheds light on the complex interplay between poor sleep quality, subjective cognitive decline (SCD), depression, and anxiety. It reveals that both depression and anxiety mediate the relationship between insufficient quality of sleep and SCD symptoms, suggesting the importance of psychological health in understanding this association. Furthermore, the study uncovers a serial mediation effect, indicating that depressive and anxiety symptoms coalesce to mediate the connection between the quality of sleep and SCD. In addition, the MM model revealed that the association between insufficient sleep and SCD was mediated by depressive symptoms and was moderated by anxiety symptoms, further highlighting the interaction between these variables. Relating this to older adults' online time and sleep quality raises the question of whether excessive screen time may lead to poor sleep and, in turn, contribute to SCD through depression and anxiety. Fundamental concepts such as cognitive decline, mental health, and the impact of technology on sleep are important to understanding these trends. Theoretical constructs such as the biopsychosocial model can provide insight into the

relationship between these variables. Current research demonstrates the effects of excessive screen time on sleep quality and mental health, but the specific mechanisms linking screen time to SCD resulting from depression and anxiety in adults have not been investigated. Major debates include disagreements about the benefits and harms of screen time on seniors' cognition and health, as well as the best way to use technology to improve health. Gaps in current knowledge include the need for longitudinal studies to establish positive associations and explore specific pathways linking screen time, sleep energy efficiency, and health outcomes in older adults. Addressing this discrepancy will provide strategies to reduce the negative impact of screen time on the cognition and health of older people and highlight the importance of concerted efforts to solve sleep problems and mental illness.

Feng, Z., Diao, Y., Ma, H., Liu, M., Long, M., Zhao, S., ... & Wang, Y. (2022) made a study on cell phone use, sadness, loneliness, and poor sleep among Chinese adults exploring the effects of increased screen time on sleep and mental illness. He emphasizes the importance of understanding the mechanisms by which cell phone use is associated with poor sleep and considers loneliness and sadness as possible treatments. This highlights the serious issue of how excessive screen use affects sleep patterns and mental health in older adults. Theories such as cognitive behavioral therapy provide an explanation for these effects. The conflicting results suggest a debate about the pros and cons of cell phone use. Longitudinal studies are needed to further explore these connections and provide strategies to improve sleep and health in older adults.

Keles, B., McCrae, N., & Grealish, A. (2020) studied the impact of screen time on mental health was revealed by a study on screen time and stress among university students in China, focusing on emotionality being poor at being a mediator and controlling emotions as a supervisor. This study offers solutions to reduce stress by showing the relationship between screen use, stress and negative emotions. It also makes us think about how screen use affects mental health at all ages and the sleep quality of older adults in particular. These relationships can be better understood using theoretical frameworks such as cognitive behavior and biopsychosocial models. Although recent research suggests that screen use has an impact on mental health, more research is needed to understand the exact mechanisms that affect sleep in the elderly. This information can help design specific interventions to improve mental health across the lifespan.

Santiago FL, Oliveira SA, de Souza SRI, et al conducted research on association between screen time exposure. A cross-sectional study conducted by Caruaru-PE investigated risk factors for drug use among young people. It explores the link between screen use, stress and sleep quality, providing a more comprehensive look at issues relevant to all ages. Although research on the effects of screen time on sleep is inconsistent, mental health and content consumption are important. The debate centered on how teens should use screens and whether they need treatment to sleep better. More research is needed to understand the link between screen time, sleep quality, and mental health, especially in older people, to develop measures for accountability use.

Leung, C., & Torres, R. (2021) studied using data from the 2018 National Survey of Children's Health to investigate the link between screen time, teenage depression, and anxiety, focusing on the role of sleep time. The study found that teenagers who used screens for more than four hours a day were more depressed and anxious, but sleep duration did not affect these effects. This points to the need to explore the impact of screen content on mental health and the impact of sleep quality and screen time. While investigating the effects of

combined screen time, further research is needed to elucidate underlying mechanisms and develop guidelines for youth use of screen time, including issues such as screen content and good sleep.

Xiong, N. (2023) examined how smartphone screen time affects mental health and sleep quality during the COVID-19 pandemic. It focuses on social and general stress and the quantity and quality of sleep. The study examined four different aspects of screen time: social media, video streaming, video games, and phone use, and found the nature of phone use and negative effects of sleep time and negative effects of screen time and social interaction. However, no significant relationship was found between total screen time and general anxiety or poor sleep quality. The findings highlight the importance of considering age, gender, and sleep quality when discussing the impact of technology on mental health and offer specific strategies to reduce the negative effects of technology, especially during periods of increased addiction.

Oswald, T. K., Rumbold, A. R., Kedzior, S. G., & Moore, V. M. (2020) made a systematic review using data from 186 quantitative studies to investigate the link between screen time, green time and mental health across age groups. He concluded that green time was associated with psychological benefits, but longer screen time was often associated with negative psychological benefits. Despite the differences in the methods used to measure screen time and green time, the same results suggest that the true relationship should be further investigated in longitudinal studies. This analysis encourages different types of analysis and intervention into the situation and emphasizes the importance of taking into account the level and context of business development. He realized that green time could reduce the problem of excessive screen time and highlight the importance of activities as activities that contribute to young people's health. This provides important new information for further research.

Hmidan, A., Seguin, D. & Duerden, E.G. Made a longitudinal study that examined the impact of screen time on Canadian students' behavior during the COVID-19 pandemic. Results showed that more internalizing behaviors (e.g., anxiety and depression) were associated with greater screen use, but were not associated with behavioral variables. However, externalizing emotions was associated with greater parenting stress. Children who grow up in stressful environments and spend too much time in front of the screen have more internalized behaviors. This study highlights the need for family interventions to improve children's mental health worldwide by reducing screen use and parental stress. Findings show a link between screen use, stress and behavioral problems.

Gao, Q., Sun, R., Li, B. et al. investigated the effects of mobile phone use (MPA) on depressive symptoms in adolescents, focusing on mediating parent-adolescent relationships. This study of 1,766 Chinese teenagers found that MPA had a direct and indirect effect on depression symptoms over MPA. The results demonstrated the important role of mediation in the parent-adolescent relationship. This study highlights the importance of managing MPA and improving the relationship between parents and adolescents by helping to develop family strategies to prevent and treat adolescent depression.

Eirich R, McArthur BA, Anhorn C, McGuinness C, Christakis DA, Madigan S made a systematic review and meta-analysis examined the relationship between screen time and behavioral problems in children under 12 years of age across 87 studies involving 159,425 participants. The findings showed a weak but significant relationship between multiple

screen time and internalizing (such as anxiety and hopelessness) and externalizing (such as aggression and ADHD symptoms) behavioral problems. Differences in results may be attributable to differences in study methods. Although the effect size was small, this study provides important new information about the impact of screen time on mental health and underscores the need for more research on the interaction between screen time and child behavior.

Conclusion

The present literature highlights the complex links between screen use, sleep quality, and anxiety in young adults. Numerous studies have found that increasing screen usage is associated with lower sleep quality and greater anxiety levels. Anxiety has a moderating function in this relationship, exacerbating sleep disruptions and contributing to a negative feedback loop that affects general mental health. The identified research gaps underline the importance of longitudinal studies to identify causal pathways and investigate specific mechanisms relating Screen Time to sleep quality via anxiety. Addressing these gaps can inspire tailored interventions aimed at minimizing the negative impacts of excessive screen usage, ultimately leading to improved sleep quality and psychological health outcomes in young adults.

Research Gaps in existing knowledge:

- Longitudinal Studies: Research demonstrating the causal links over time between screen use, anxiety, and sleep quality is few. The question of whether more Screen Time raises anxiety, which in turn affects sleep quality, or whether the opposite of it could be better understood with the use of longitudinal designs.

- Mechanistic Understanding: Further investigation is required to pinpoint the precise mechanisms by which Screen Time affects anxiety and, in turn, affects the quality of sleep. Investigating how screen use affects psychological processes like cognitive arousal, pre-sleep cognitive activity, and emotional regulation is part of this.

- Variability Across Screen Types: The majority of research concentrates on Screen Time in general without identifying the distinct effects of various screen types (such as computers, tablets, and cellphones) on anxiety and sleep.

- Population Diversity: Previous research has frequently concentrated on certain locations or demographic groupings. Further investigation is required to comprehend the ways in which cultural, socioeconomic, and developmental elements impact the correlational relationship between Screen Time, Anxiety, and Sleep Quality in young adults from a variety of diverse backgrounds.

- Intervention Studies: Few intervention studies explicitly address lowering Screen Time or controlling anxiety to enhance young adults' sleep quality.

METHODOLOGY

The widespread use of screens in the digital age, especially among young adults, has given rise to serious worries about the effect of psychological health and sleep quality. Young adults, defined as those aged between 18 and 25, depend more and more on computers, tablets, and cell phones for communication, amusement, and information access. Many studies have been conducted to determine the impact of Screen Time on many aspects of health, with a focus on potential disruptions to sleep patterns. In early adulthood, getting enough sleep is essential for maintaining mental clarity, emotional stability, and general physical health. New studies show excessive screen usage may negatively impact sleep quality, contributing to longer sleep latency, disturbed sleep patterns, and shorter sleep duration in this population. The main goal of the research is for investigating complex interplay of young adults' screen use, anxiety levels, and sleep quality. It is essential to comprehend these relationships since they are essential to preserving the best possible health and wellbeing throughout this developmental period. This study looks at the relationship between Screen Time and anxiety levels and sleep quality in an effort to identify potential mechanisms by which screen-related activities may affect young adults' mental and physical health outcomes. The ultimate aim is to give information for focused treatments and public sectors to improve young individuals to adopt healthy screen-use behaviors and improve sleep in the current digital age

Aim

The aim of the research is to investigate the relationship between screen time, sleep quality and anxiety.

Research Question:

What is the relationship between screen time, sleep quality, and anxiety in young adults, and how do these factors interact to influence mental and physical well-being?

Objective:

- To assess the extent of time among young adults using the IAT
- To evaluate sleep quality using the PSQI among the study participants
- To measure anxiety levels using GSD 7 questionnaire in the sample
- To explore the correlations between Screen Time. sleep quality and anxiety levels

Hypothesis

- There is no any significant relationship between Screen Time and sleep quality and anxiety
- There is a strong significant relationship between Screen Time and sleep quality and anxiety mediates the relationship between Screen Time, sleep quality.

Research variables

- **Independent:** Screen Time which is the hours spent on screen by the young adults.
- **Dependent:** Sleep quality which is the subjective assessment of sleep pattern and quality among young adults, measured by validated scales like PSQI so this variable talks about how well or poorly the young adults perceive sleep.
- **Mediator variable:** Anxiety which is the intermediate factor between Screen Time and sleep quality

Research Design:

Research design is the structured and systematic plan or blueprint that outlines the entire process of conducting a research study. It encompasses the strategies, methods, and procedures that a researcher will use to gather, analyze, and interpret data to answer specific research questions or test hypotheses. A well-defined research design is crucial because it guides the researcher in achieving the research objectives effectively and efficiently while ensuring content authenticity of the study's findings.

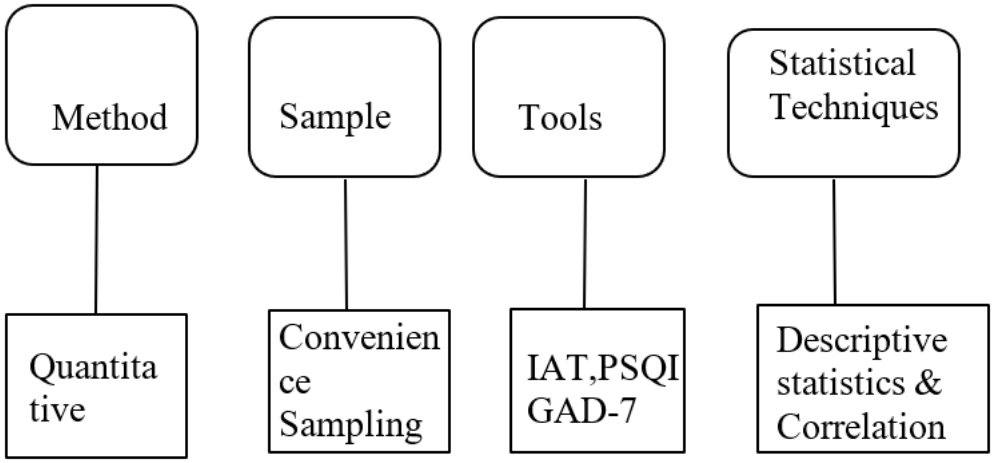


Fig 1.0: Research Design

Research Setting:

This study is not dependent on a specific setting or location since it uses convenience sampling. Hence it is based on the convenience and availability of the participants, the location was selected. The data was collected by using Google Form. It is a versatile, user-friendly, and dynamic online survey and data collection tool. Google form consists of the consent form, demographic details and three questionnaires.

Sampling Requirements

- **Sampling Technique:** The sampling technique in this study is convenience sampling which is readily available for the researcher and also allows the researcher to quickly access and collect the data.
- **Sampling Size and Nature:**
  - This study consists of 169 young adults doing their UG, PG, working individuals etc.
  - Age group selected for this research is between 18 to 25 years.

Sampling Criteria

Participant Inclusion Criteria

1. The study sample will be limited to young adults
2. Voluntary participation
3. Young adults within the range of 18 -25 years
4. Young adults who are currently pursuing they’re under graduation, post-graduation, MPhil, diploma and working individual

Participant Exclusion Criteria

1. People who are less or more than the age of 18-25.

Data collection method

Procedure:

A proper consent form was prepared prior to the commencement of data collection activity. In the first page consent form was attached in the google form. This section also includes what the study is for. So that participant understands the concept. The participants were well aware of participant inclusion and exclusion criteria. Keeping in mind the ethical consideration, the confidentiality of each participant has been maintained throughout the research.

- In the next section demographic details form has been added to get basic and important details of the participants.
- After the demographic details the part includes the Internet addiction test (IAT), along with the instruction.
- In the next section Pittsburgh sleep quality index (PSQI) was added along with the instruction.
- In the last section Generalized anxiety disorder 7 (GAD -7) was added along with the instruction.
- After collecting the data, it was transferred to software SPSS for data analysis. Correlation has been done to find out the relation between societal stigma, discrimination and depression.

Tools of data collection:

1. **Socio-demographic Data Sheet:** It is a semi-structured Performa. It contains information about socio-demographic variables like name, age, gender, education, location etc.
2. **Internet Addiction Scale (IAT):** assesses the degree of problematic internet use and offers information about the participants' degree of obsessive and dependent internet and screen device use.
3. **Pittsburgh sleep quality index (PSQI):** utilized to evaluate the previous months' worth of subjective sleep quality, sleep latency, length, habitual sleep efficiency, sleep disruptions, use of sleep medicine, and dysfunction during the day.
4. **Generalized anxiety disorder 7 (GAD -7):** evaluates the intensity of anxiety symptoms in order to ascertain how anxiety affects a person's ability to function in daily life and overall well-being.

Internet Addiction Scale

A popular evaluation tool for determining an individual's level of internet use and its possible influence on their everyday life is the Internet Addiction Test (IAT). It was created by Dr. Kimberly Young in 1998 and has 20 items that assess several facets of using the internet, such as:

- Salience: The importance of using the internet in daily life.
- Overuse: The quantity of time spent on the internet.
- Work neglect: The effect on output or productivity.
- Expectations: Contemplations of being online while offline.
- Lack of control: Having trouble restricting internet usage.
- Neglecting social life: The effects on interpersonal connections.
- With a sum of 0 to 100, every item is assessed on a Likert scale from 0 (not relevant) to 5 (always). Higher ratings indicate a higher level of addiction.
- Reliability and Validity: With a Cronbach's alpha range from 0.85 to 0.90, suggesting dependable internal consistency, the IAT demonstrates good reliability.

The scale's capacity to detect internet addiction consistently over time is further supported by test-retest reliability.

- Validity: The IAT's efficacy in identifying problematic online behaviors is demonstrated by its noteworthy correlations with other measures of internet use and addiction. Its capacity to differentiate degrees of internet dependency lends credence to its construct validity.

PSQI

This self-report questionnaire called the Pittsburgh Sleep Quality Index (PSQI) evaluates sleep quality and disruptions over the course of a month. In 1989, Dr. Daniel Buysse and associates created it. The 19 separate items that make up the PSQI provide seven component scores:

- subjective quality of sleep
- Sleep latency, or the amount of time needed to nod off
- length of sleep
- Habitual sleep efficiency, or the proportion of time spent in bed to total sleep time
- disruptions to sleep
- Using sleeping pills
- Dysfunction during the day
- Higher scores correspond to lower quality sleep, with each component score having a range of 0 to 3. The total of the seven component scores, which range from 0 to 21, determines the global PSQI score. A score of more than 5 denotes poor sleep quality.
- Reliability and validity
- Reliability: With a Cronbach's alpha usually above 0.70, the PSQI shows great reliability and constant internal consistency across different populations. Additionally, test-retest reliability exhibits good temporal stability, guaranteeing accurate assessments of sleep quality.
- Validity: The PSQI is deemed valid due to its robust associations with other recognized sleep measures and its capacity to distinguish between individuals who sleep well and those who don't. Studies on its convergent and discriminant validity provide more evidence that it is a reliable method for identifying sleep disorders.

Generalized Anxiety Disorder -7

A quick self-report test called the Generalized Anxiety Disorder 7 (GAD-7) is used to identify and gauge the severity of generalized anxiety disorder. It was created in 2006 by Dr. Robert L. Spitzer and associates and consists of seven items that rate the occurrence of anxiety symptoms throughout the previous two weeks:

- Sensation of trepidation, anxiety, or edge
- being unable to manage or cease worrying
- worrying excessively about a variety of issues
- Having trouble unwinding
- having trouble staying motionless due to constant restlessness
- becoming agitated or easily irritated
- having the anxiety that something dangerous will occur
- With a sum of 21 which is from 0 -21 assessed on a Likert scale 0 means not at all to 3 is almost every day. The interpretation is categorized as follows:
  - 0 - 4: Minimal
  - 5 - 9: Mild

  - 10 - 14: Moderate
  - 15- 21: Severe
- Reliability and Validity: Excellent reliability is demonstrated by the GAD-7 scale, with a Cronbach's alpha of roughly 0.92, indicating great internal consistency. Strong test-retest reliability attests to the scale's capacity to reliably gauge anxiety symptoms over time.
- Validity: The GAD-7 has a high sensitivity, indicating great validity. Significant associations with other anxiety and psychological health measures confirm its validity and demonstrate how accurate it is at determining the intensity of anxiety.

Data Analysis Methods:

Statistics Used:

- Descriptive Statistics
- Spearman's rho correlation coefficient

Descriptive Statistics:

- Descriptive statistics is used for finding the mean and standard deviation of the sample.
- Spearman's rho correlation coefficient.

RESULT AND DISCUSSION

Table 1 Socio demographic details of the participants

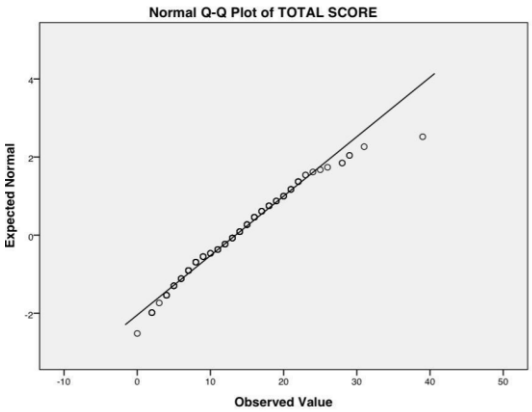
Variables	Category	Frequency	Percentage
Gender	Male	75	55.8%
	Female	96	43.6%
	Prefer not to say	1	
Occupation	Employed	59	34.3%
	Unemployed	15	8.7%
	Student	97	55.4%
	Others	1	0.6%
Education Level	Undergraduate	89	51.7%
	Postgraduate	72	41.9%
	MPhil	6	3.5%
	Others	5	3%

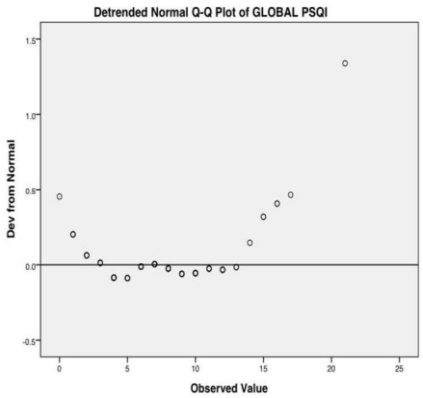
Table 1 shows the socio demographic details of the participants which includes gender, occupation and educational level. So according to the table there are 55.8% of male participants with the frequency of 75 and female participants are 96% with the frequency of 96. There is only one participant with the frequency of 1 which comes under the category of prefer not to say. Under the occupation there are 34% of employed and 8.4% of unemployed participants. Also, there are 55.4% of students and only one participant comes under the other category. In Educational level the total percentage of undergraduate participants are 51.7% and 41.9% for postgraduates, also 3.5 % and 3% for MPhil and others.

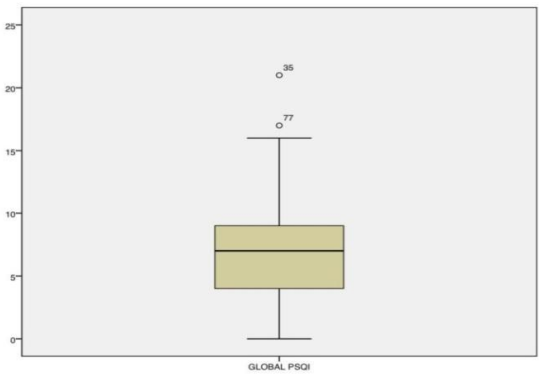
Table 2 Normality test of the variables.

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistics	**df**	**Sig.**	**Statistics**	**df**	**Sig.**
PSQI	.080	169	.010	.974	169	.003
GAD- 7	.069	169	.051	.976	169	.003
IAT	.067	169	.063	.977	169	.003

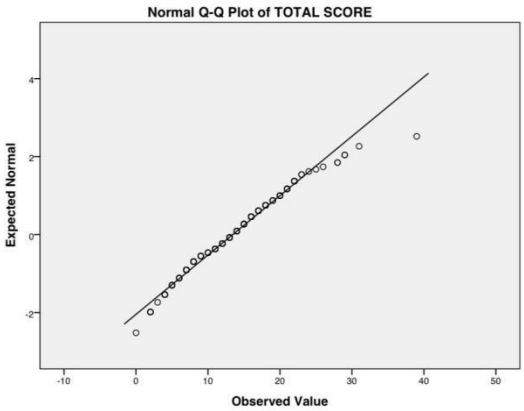
PSQI

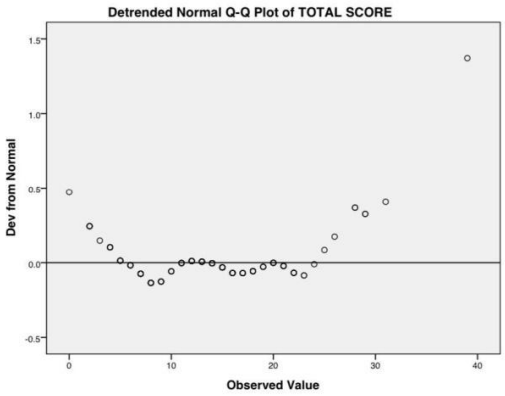


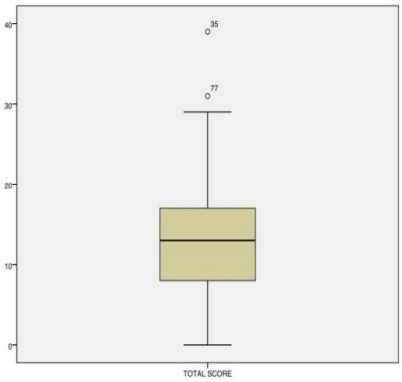




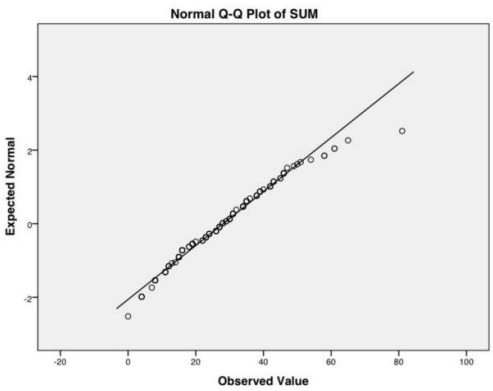
Generalized anxiety scale -7

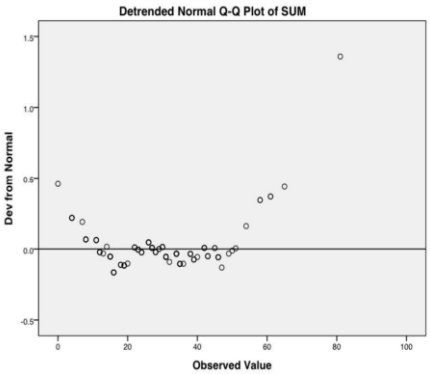


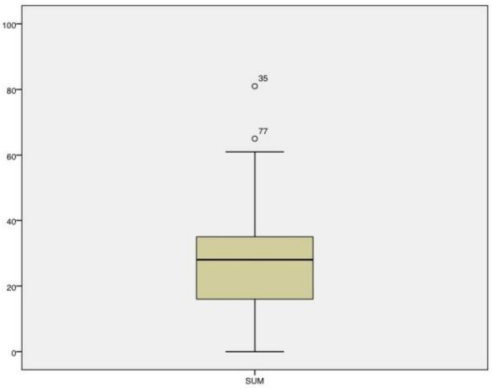




Internet assessment scale







With these normality distribution features, we can analyze the proper correlation coefficient that needs to be used. For all the three variables the curve is deviated from the normal distribution so the appropriate correlation coefficient to be used is spearman's correlation. By using the appropriate correlational analysis, we can get an accurate and reliable outcome.

Table 3 Descriptive Statistics of the Research Variable

VARIABLES	N	MEAN	STANDARD DEVIATION
GLOBAL PSQI	169	7.33	3.545
IAT	169	13.44	6.570
GAD	169	28.09	13.643

The PSQI ratings show how well 169 participants slept overall. A PSQI score of more than five indicates poor sleep quality, and the mean score of 7.33 implies that people are not getting enough sleep. This is corroborated by the median score of 7.00, which indicates that

at least half of the subjects had scores that point to inadequate sleep quality. The individuals' sleep quality ratings showed a moderate dispersion, as indicated by the standard deviation of 3.545. The wide variability in sleep quality was suggested by the range of 21.

Internet Addiction Test (IAT) results indicate a mean of 13.44 and a median of 13.00, indicating that, on average, the participants have low to moderate degrees of online addiction. The range of 39 suggests a wide range of addiction severity within the sample, while the standard deviation of 6.570 indicates significant heterogeneity in the participants' levels of internet addiction.

With a mean of 28.09 and a median of 28.00 on the anxiety scale, the individuals' average levels of anxiety are moderate. The sample's anxiety levels appear to vary significantly, as seen by the high standard deviation of 13.643, which indicates 81 different levels of anxiety intensity among the subjects.

- **PSQI:** Given that the average score implies lower quality of sleep with moderate variability, a sizable fraction of the population appears to have sleep problems.

- **IAT:** Although the average score points to low to moderate internet addiction, certain people may still be in trouble due to the considerable variability.

- **GAD-7:** The mean score indicates a moderate level of anxiety with notable variability, emphasizing the wide range of anxiety severity among the participants.

These figures offer insightful information on the health of the population being studied, highlighting significant issues with anxiety, internet addiction, and poor sleep quality. Improving general psychological health and well-being to show problems with specialized interventions.

HA: There is a significant relationship between Screen Time and sleep quality and anxiety

Table 4 Spearman's rho Correlation Coefficient

Global PSQI	Spearman's rho Correlation	1.000	.993*	.997**
	Sig.(2-tailed)		.000	.000
	N	169	169	169
Generalized anxiety Scale	Spearman's rho Correlation	.993**	1.000	.999**
	Sig.(2-tailed)	.000		.000
	N	169	169	169
Internet Assessment Scale	Spearman's rho Correlation	.997**	.999**	1.000
	Sig.(2-tailed)	.000	.000	
	N	169	169	169

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

The associations between the 169 young adults' PSQI, Anxiety Scale, and IAT (Internet Addiction Test) scores are displayed in the correlation table. All of the variable pairs have very strong and substantial correlations, according to the data. The PSQI and the Anxiety Scale have correlation coefficients of.993 and.997, respectively, which are both significant at the 0.01 level. This suggests a strong correlation between higher levels of worry and more

internet addiction and higher PSQI scores, which are a measure of poorer sleep quality. Strong correlations have been found between the Anxiety Scale and the PSQI (r =.993) and the IAT (r =.999), both of which are significant at the 0.01 level. This implies a clear correlation between higher levels of worry and both worse sleep quality and internet addiction. Lastly, the correlation coefficients between the IAT score and the PSQI and the Anxiety Scale are.997 and.999, respectively, and they are both significant at the 0.01 level. This suggests a clear correlation between increased internet addiction and increased anxiety as well as lower sleep quality.

All things considered, these findings demonstrate the strong correlations that exist between anxiety, internet addiction, and sleep quality in young adults, highlighting the possible moderating function of anxiety in the link between Screen Time and sleep quality.

DISCUSSION

The information displayed in the tables offers a thorough understanding of the connections between the 169 participants' sample's anxiety levels, internet addiction, and sleep quality. Each variable's descriptive statistics provide information about its variability and central tendencies, while the correlational analysis shows the degree and importance of the relationships between these variables. Participants generally had poor quality sleep, as indicated by the average PSQI score of 7.33; levels higher than 5 indicate sleep disruptions. The moderate diversity indicated by the standard deviation of 3.545 suggests that although some people may have excellent sleep quality, a considerable proportion of people may have difficulty with it. This variation shows that this population may benefit from focused interventions to address sleep-related problems. With a mean score of 13.44, the IAT results show that individuals are less likely to be internet addicts. The 6.570 standard deviation, however, indicates that there is a significant range in internet addiction levels. This variation shows that whereas many people might only have minor problems related to internet addiction, others might be dealing with serious issues that need medical treatment. With the increasing popularity of internet use and its possible impact on mental health, it may be imperative to address these issues.

The GAD-7 scores, with a mean of 28.09 and a large standard deviation of 13.643, indicate that the participants had moderate levels of anxiety. This significant diversity suggests that anxiety spans a wide range in people, from mild to severe. Improving general psychological health and well-being requires an understanding of and attention to these anxiety levels. The PSQI, Anxiety Scale, and IAT scores among 169 young adults have very strong and substantial associations, as the table demonstrates. There is a considerable correlation between higher anxiety and internet addiction and poorer sleep quality. The PSQI correlates with the Anxiety Scale by.993 and the IAT by.997, both significant at the 0.01 level. There is a strong correlation between higher degrees of internet addiction and increasing anxiety, as indicated by the Anxiety Scale.999 correlation with the IAT. These results emphasize the important connections between anxiety, internet addiction, and sleep quality, highlighting the possibility that anxiety may interact between Screen Time and sleep quality. These results emphasize how important it is to treat anxiety, internet addiction, and poor sleep quality holistically. Strategies for controlling anxiety, encouraging responsible internet use, and enhancing sleep hygiene are all potential areas of special effectiveness for interventions. Greater integration and comprehensive approaches to psychological healthcare can be informed by an understanding of the significant links between these variables, which will eventually improve results for those dealing with these interrelated problems.

CONCLUSION

Summary

The study aims to investigate the connections among young adults (18–25 years old) from India who were undergraduates, postgraduates, MPhil candidates, diploma holders, and employed in relation to Screen Time, sleep quality, and anxiety. Convenience sampling was used in the study, and data were gathered via a Google Form that contained three questionnaires: the Internet Addiction Test (IAT), Pittsburgh sleep quality index (PSQI), and Generalized anxiety disorder 7-item (GAD-7) scale. Important key finding of the research: a standard deviation of 3.545 indicates substantial variability in sleep quality, whereas the mean PSQI score of 7.33 indicates generally poor sleep quality among participants. A standard deviation of 6.570 indicated significant heterogeneity in online addiction levels, with the mean IAT score of 13.44 indicating low to moderate degrees of internet addiction. With a standard deviation of 13.643, the mean GAD-7 score of 28.09 indicated moderate anxiety levels; there is also significant variation in the participants' anxiety levels. The results of the correlation study show that among young individuals, there are very strong and substantial correlations between internet addiction (IAT), anxiety (Anxiety Scale), and sleep quality (PSQI). Higher degrees of anxiety and online addiction are substantially correlated with poorer sleep quality, and higher levels of anxiety are closely linked to greater internet addiction. These results imply that worry might be a key mediating factor in the connection between Screen Time and the caliber of sleep. The results indicated a significant association between anxiety levels, internet addiction, and sleep quality, with the data showing very strong positive correlations between these factors. Anxiety is positively correlated with internet addiction and negatively correlated with poor sleep. Because of their connection, treating all three areas is crucial to improving overall wellbeing. The population's varying levels of anxiety, internet addiction, and poor sleep quality point to the possibility that specific interventions could improve psychological health outcomes. The complex links between screen use, sleep quality, and anxiety in young adults are highlighted by this study. According to the research, anxiety and internet addiction are highly correlated with poor sleep quality, which is common among young individuals. Even at low to moderate levels, internet addiction can have a major negative effect on anxiety and sleep quality. The association between screen usage and sleep quality is significantly mediated by anxiety, emphasizing the importance of holistic psychological health measures.

Conclusion

This research indicated that among young individuals in India, ages 18 to 25, screen use, sleep quality, and anxiety are significantly correlated. The results show a robust correlation between higher degrees of internet addiction and worse sleep quality as well as higher levels of worry. In this association, anxiety plays a critical mediating role, highlighting the necessity of comprehensive approaches to psychological health that concurrently treat all three components. Targeted therapies are necessary because this population has moderate degrees of internet addiction, anxiety, and poor sleep quality. Various strategies have the potential to improve psychological health and well-being, including those that encourage responsible internet use, improve sleep hygiene, and offer effective anxiety management. Subsequent investigations ought to delve deeper into these associations across a range of demographic categories and also calculate the impacts of particular intervention approaches. Policymakers, educators, and healthcare professionals may create more effective programs and policies to assist young people' psychological health by comprehending and addressing the connections between Screen Time, anxiety, and sleep quality. In an increasingly digital world, this all-encompassing approach is essential for promoting a better, more balanced lifestyle.

Recommendation for the further research

- **Longitudinal Studies:** Investigate the long-term impacts of screen usage on anxiety and sleep quality using longitudinal studies. Determining causal links and changes over time can be aided by this.
- **Intervention Studies:** Create and evaluate targeted interventions to cut down on screen usage, enhance sleep hygiene, and help with anxiety management. Assess these programs' efficacy across a range of contexts and demographics.
- **Diverse Demographics:** These factors may affect the connections between Screen Time, anxiety, and sleep quality, broaden the study to include a range of demographic groupings, including age groups, socioeconomic classes, and cultural backgrounds.
- **Qualitative Research:** Use qualitative techniques, such focus groups and interviews, to learn more about the individual experiences and viewpoints of young people on anxiety, sleep, and Screen Time.
- **Technology Types:** Distinguish between different kinds of Screen Time (social media, gaming, and academic use, for example) for checking any are more strongly linked to anxiety and improper quality of sleep than others.
- **Physical health correlation:** Examine the possible relationships between physical health outcomes, such as obesity, cardiovascular health, and general well-being, and Screen Time, anxiety, and poor sleep.
- **Psychological Mechanism:** Examine the psychological mechanisms, such as cognitive arousal, stress, and emotional control, that underlie the link.
- **Impact of Sleep therapies:** Assess how anxiety is decreased and the negative impacts of time spent on screen in quality of sleep are moderated by sleep-focused therapies such cognitive-behavioral therapy for insomnia (CBT-I).
- **Technology Usage Patterns:** Examine how people use technology, taking into account the context, timing, and length of Time spent on screen, for pinpointing the precise actions that have the greatest negative effects on mental and sleep hygiene.
- **Policy and Education:** Assess the efficacy of public health policies and educational initiatives designed to encourage young adults to adopt healthy screen-time routines and enhance their sleep hygiene.

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Conflict of Interest

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