

Digital Dilemma: Internet Addiction, Sleep Quality, and Psychological Well-Being in Adult Population of Kolkata

Deya Bhattacharyya*

Abstract

The 21st Century expeditious digitalization of modern society has made internet uses an integral part of daily life. However, unrestricted internet engagement, often leading to internet addiction, has been linked to poor sleep cycle or circadian rhythm and declined psychological well-being. This study aimed how was the relationship between internet addiction, sleep quality, and psychological well-being among adult age group. Data were gathered during August and October of 2025. A total of 100 participants adult aged from 27–45 years were recruited through snowball sampling. For this study Ex post facto research design was endorsed. Google form was used to assist accumulate the data. Standardized instruments, including the Internet Addiction Test (IAT) from 2016 developed by Kimberly Young, Pittsburgh Sleep quality index (PSQI) from 1989 developed by Daniel J. Buysse and his associates at the University of Pittsburgh, and Psychological Well-Being Scale (PWB) Ryff & Keyes(1995), were administered. Data were analyzed using descriptive statistics, Two-way ANOVA, Pearson's correlation and regression analysis among variables. There was a positive correlation between increased internet addiction and poor sleep quality ($r = 0.486$; $p < 0.01$). Conversely, higher levels of psychological well-being were negatively correlated with both internet addiction ($r = -0.603$; $p < 0.01$) and poor sleep quality ($r = -0.701$; $p < 0.01$). Additionally, the impact of internet addiction on sleep quality, internet addiction on psychological well-being, and sleep quality on psychological well-being showed average r^2 values, all significant at the 0.01 level. A two-way ANOVA revealed a significant interaction effect between internet addiction and psychological well-being on sleep quality, significant at the 0.05 level. The findings underscore the need for age-appropriate digital literacy and mental health interventions to mitigate the adverse effects of excessive internet use on sleep and overall well-being for every individual.

Keywords: Internet addiction, sleep quality, psychological well-being, adult age groups, Kolkata.

In 21st century, the rapid expansion of digital technology and internet accessibility has revolutionized the way people communicate, work, and entertain them in multiple aspects. While these advancements have enhanced connectivity and information exchange, they have also given rise to problematic usage patterns, often referred to as Internet Addiction (IA). Internet addiction, defined by an overwhelming or poorly managed focus, impulses, or actions related to internet usage, can result in considerable disruption or distress in everyday life (Young, 1998). Although the phenomenon is commonly discussed in the context of adolescents and young adults, middle-aged individuals are increasingly experiencing similar challenges as digital technology becomes integral to both their professional and personal lives. Adulthood, typically defined as the period between 27 and 45 years, is a stage marked by heightened responsibilities, career demands, and family obligations. Consequently, individuals in this age group often rely heavily on the internet for work, communication, relaxation and some of the person used it negatively.

Internet Addiction

Internet addiction refers to excessive usage of internet or compulsive or uncontrolled usage of internet that

interferes with a person's daily life, work, relationships, and overall well-being. Internet addiction falls under behavioral addiction.

Key Features of Internet Addiction are excessive use of internet, Withdrawal symptoms while not expose in internet, high exposure of internet tolerance, Neglect others work and family and close relationship also and loss of control of own self.

Types of Internet Addiction

According to Kimberly Young (1998), Internet addiction can be categorized into the following types:

Porn and Cyber-sexual addiction: In 21st century this is the major internet addiction. Porn and cybersex addiction define as online activities in porn site and sexual activities through internet. Viewing pornographic videos and sexual images on internet porn sites, whether paid or free websites. Cybersex addiction refers to sexual intercourse in online platform through dating apps or social media.

Social media addiction: Social media addiction refers to the inability to regulate the use of platforms such as Facebook, YouTube, Snapchat, WhatsApp, and Instagram. When individuals cannot manage their social media activities, which are often used to connect with family and friends, it can lead to addiction.

*Former student, Maulana Abul Kalam Azad University of Technology, West Bengal, India Email:deyabhattacharyya2000@gmail.com

Gaming addiction: In recent times gaming addiction is very crucial in internet addiction. It refers to excessive use of gaming app or playing video games in internet like card games, bike-car games, role playing games in online.

Online Relationship addiction: According to Kimberly Young (1999) Online Relationship Addiction refers to excessive involvement in online relationships, such as chat rooms, social networking, or online dating, to the extent that it interferes with real-life relationships and responsibilities.

Compulsive information seeking: Compulsive information seeking refers to the constant need or desire to acquire knowledge or information from the internet. When doctor giving medicine we firstly Google it and there is any side effect or not and seeing composition of the medicine. When it is happen excessive then it goes to compulsive information seeking.

Online compulsions: Online Compulsion refers to excessive or compulsive online activities such as gambling, shopping, or trading, which can disrupt daily life, financial stability, and emotional well-being. It is seen in window shopping from e-commerce apps.

Cause of Internet Addiction

There are many causes but important causes are Lack of social support or family support in the society or in the environment. Mostly society is not giving the priority in the environment. Tension, stress, anxiety, phobia are also a major role in internet addiction. Impulsivity, sensation-seeking, and poor self-control are increase the vulnerability to access internet.

Effect of Internet Addiction

An internet addiction can have many negative effects on you physically, mentally and emotionally. In physiological effects are body aches like pimples, carpal tunnel syndromes, sleeping issues (insomnia), eye related problems and weight gain/loss. Mental and emotional effects are depression, dishonesty, anxiety, hostility, fragile and mood swings. It affects social life also. In addition, people experience domino effect, decrease productivity, job loss, poor concentration, lack of patience etc. These can lead to broken relationship, family problems.

Sleep

Sleep acts as a balm that calms and rejuvenates after a hectic day. It is largely governed by the body's internal clock, which is influenced by external factors like sunlight and temperature. The body's natural rhythm of sleeping and waking aligns fairly well with a 24-hour cycle.

Interruptions in this cycle can disrupt the functioning of various body systems. Aspects such as learning, memory, endurance, overall health, and mental well-being are all impacted by how long and how well one sleeps. Many individuals find sleep elusive or disturbed. Indeed, most people encounter difficulties falling asleep at some stage in their lives. Consistently inadequate sleep can lead to issues such as obesity, heart disease, diabetes, and aggression-related problems. Lack of sleep can also impair judgment and mental sharpness in everyone.

Sleep needs vary by age to age, and alteration exists even within age groups. However, in general, the National Sleep Foundation offers these daily sleep recommendations:

- Infants(4-11months):12-15 hours
- School-age children(6-13):9-11hours
- Teenagers(14-17):8-10hours
- Young adults(18-25): 7-9hours
- Adults(26-64):7-9hours
- Older adults(65+):7-8 hours

Elements of Sleep Quality

- Sleep latency: The duration it takes for you to fall asleep each day.
- Awakenings: The number of times you wake up throughout the night.
- Wake after sleep onset: The amount of time you remain awake after initially falling asleep.
- Sleep efficiency: The proportion of time you spend sleeping compared to the total time you are in bed.

Affects Sleep Quality

- Age: Older people may have different sleep timing needs than younger people.
- Sleep disorders: Sleep apnea and periodic leg movement scan cause sleep disruptions and also insomnia.
- Medications: Stimulants like caffeine and nicotine can interfere with sleep at night.
- Alcohol: Alcohol can disrupt sleep later in the night.

Insomnia is a sleep dysfunction characterized by difficulty in falling asleep. Most people occasionally experience sleepless nights. However, if an individual struggles to fall asleep, wakes up during the night or early in the morning, and finds it hard to return to sleep and this occurs at least three times a week for several months, they are likely dealing with chronic insomnia. This condition can lead to daytime tiredness and low energy levels. Those with insomnia may also face reduced coping abilities, challenges in maintaining focus and concentration, memory issues, and difficulty completing even routine tasks. But most of all,

insomnia affects mood and mental health. The chronic sleep disruption of insomnia appears to be a major trigger for depression and irritability and aggression.

Psychological well being

Psychological well-being refers to an individual's overall mental, cognitive, and social functioning, reflecting how people evaluate their lives and experience positive mental health. It encompasses self-acceptance, personal growth, and purpose in life, autonomy, positive relationships, and environmental mastery. According to Carol D. Ryff (1989), psychological well-being is not merely the absence of mental illness but the presence of positive psychological functioning and fulfillment. It involves maintaining a balance between positive emotions, such as happiness and life satisfaction, and the ability to cope effectively with stress and negative experiences. Individuals with high psychological well-being tend to have strong self-esteem, meaningful social connections, and resilience against life's challenges. Various factors like personality, social support, and lifestyle, and environmental conditions, influence well-being. In the context of modern society, excessive internet use and digital dependency can negatively impact psychological well-being by increasing loneliness, anxiety, and social isolation, thereby reducing overall life satisfaction.

Internet addiction (IA) also referred to as problematic internet use (PIU) or excessive internet use, has appeared as a intercontinental behavioral health concern affecting solitary across all age groups. At first conceptualized by Young (1998) as an impulse-control disorder involving extravagant online behavior, Internet addiction has since been linked to a diversity of psychological and physiological outcomes. Kuss and Griffiths (2017) defined Internet addiction as the inability to control one's online activity, leading to distress and impairment in daily life functioning. While earlier research focused primarily on adolescents and college students, recent evidence demonstrates that Internet addiction significantly impacts adults as well (Pan et al., 2020; Alimoradi et al., 2022). The growing integration of digital technology into daily life has blurred the line between healthy and pathological use, necessitating a comparative understanding of how Internet addiction influences other domains such as sleep quality and psychological well-being across different adult age groups.

Internet Addiction and Its Measurement

Internet addiction is commonly assessed using standardized tools such as **Young's Internet**

Addiction Test (IAT) (Young, 1998), which evaluates the extent of preoccupation and loss of control associated with online activities. Several studies have confirmed the reliability and validity of the IAT across different cultural contexts (Widyanto & McMurran, 2004; Pan et al., 2020). Alternative scales, including the Compulsive Internet Use Scale (Meerkerk et al., 2009), have also been employed in adult populations. Kuss et al. (2018) emphasized that Internet addiction encompasses various subtypes, including gaming addiction, social media addiction, and information overload, each of which exhibits different psychological correlates. These distinctions are essential in comparative studies since age groups often differ in their primary form of online engagement — younger adults tend toward gaming and social media, while older adults engage more in communication and information-related activities (Lu et al., 2024).

Prevalence and Age Differences

A meta-analysis by Pan, Chiu, and Lin (2020) estimated that the global prevalence of internet addiction ranged between 6% and 10% of the general population, with the highest rates observed among young adults. Alimoradi et al. (2022) similarly found that Internet addiction prevalence decreased with age but remained a significant concern among middle-aged adults. This pattern is supported by Arayıcı et al. (2025), who noted that while young adults exhibit higher compulsive use due to social media dependency, older adults demonstrate moderate but sustained online engagement patterns that can still lead to psychosocial strain. Li (2024) and Lu et al. (2024) observed that older adults often use the internet for social communication, which can have positive effects on loneliness and well-being, suggesting that the consequences of internet use are nuanced and age-dependent.

Internet Addiction and Sleep Quality

A strong association exists between excessive internet use and poor sleep quality. Several studies have reported that individuals with higher IAT scores exhibit poorer sleep outcomes, including longer sleep latency, reduced duration, and higher daytime dysfunction. Lin et al. (2019) demonstrated that problematic internet users often experience delayed sleep onset due to prolonged nighttime screen exposure and heightened cognitive arousal. Similarly, Alimoradi et al. (2022) found that behavioral addictions, including Internet addiction, were consistently linked to sleep disturbance and insomnia symptoms. A recent study by Guo et al. (2025) among medical students

showed that IA was significantly correlated with higher Pittsburgh Sleep Quality Index (PSQI) scores, indicating poor sleep quality. These findings suggest that internet overuse disrupts circadian rhythms and sleep hygiene practices across different age cohorts.

Mechanisms Linking Internet Addiction to Sleep Disturbance

Several mechanisms explain how Internet addiction negatively impacts sleep. Exposure to blue light from digital appliances inhibits the production of hormone melatonin, leading to disruptions in the body's natural sleep-wake cycle (Cain & Gradisar, 2010). Moreover, spending inordinate time on emotionally engaging online activities—like interacting on digital media or playing video games—heightens physiological arousal and mental alertness, which further postpones the onset of sleep (Exelmans & Van den Bulck, 2017). Arayıcı et al. (2025) noted that late-night internet use reduces total sleep duration and quality, which subsequently affects mood and cognitive performance the next day. These mechanisms highlight that sleep problems are both a consequence and a perpetuating factor of problematic internet use, particularly in younger adults who spend longer hours online during night-time hours.

Internet Addiction and Psychological Well-Being

Psychological well-being (PWB) involves the emotional, social, and cognitive dimensions of mental health, such as self-acceptance, having a purpose in life, and fostering positive relationships (Ryff, 1989). A wealth of research has shown a negative link between Internet addiction and Psychological well-being. Sharma and Sharma (2018) discovered that college students with high levels of Internet addiction exhibited lower self-esteem and life satisfaction. In a similar vein, Soriano-Molina et al. (2025) identified a strong connection between problematic internet use among young adults and symptoms of depression, anxiety, and diminished psychological well-being. Among adults, Arayıcı et al. (2025) found a significant negative correlation between scores on the Internet Addiction Test and Psychological Well Being, suggesting that excessive internet use leads to emotional burnout and social isolation. Conversely, Li (2024) contended that moderate internet use among older adults can enhance certain aspects of well-being by alleviating loneliness and improving communication with family, highlighting the importance of the purpose of use in determining outcomes.

Interrelationship between Internet Addiction, Sleep Quality, and Psychological Well-Being

Emerging studies have begun exploring the interrelationship between Internet addiction, sleep quality, and Psychological well being simultaneously. For instance, Arayıcı et al. (2025) demonstrated that sleep quality mediates the relationship between Internet addiction and psychological well-being — individuals with higher Internet addiction scores reported poorer sleep, which in turn predicted lower well-being. Similar findings were reported by Lu (2023), who used network analysis to reveal that sleep disturbance acts as a central node connecting internet addiction and emotional distress. This suggests that poor sleep serves as both a symptom and a pathway through which Internet addiction impacts mental health. The mediating role of sleep has been supported by multiple studies across age groups (Guo et al., 2025; Ahmed et al., 2024), implying that interventions targeting sleep hygiene could improve well-being among individuals struggling with excessive internet use.

Age as a Moderator

Age plays a moderating role in the relationship among Internet addiction, sleep quality, and psychological well-being. Younger adults, who are more active on social media and online entertainment platforms, experience higher Internet addiction prevalence and greater sleep disturbances compared to middle-aged and older adults (Pan et al., 2020). However, middle-aged adults, often engaged in work-related internet use, may experience stress-related sleep disruption rather than compulsive use (Lu et al., 2024). In contrast, older adults typically use the internet for social interaction or cognitive stimulation, which may improve psychological well-being if usage remains moderate (Li, 2024). This age-specific differentiation underscores the need for comparative studies that address how online behavior affects well-being outcomes differently across the adult lifespan.

Methodological Limitations in Existing Literature

Most studies exploring Internet addiction, sleep-quality and Psychological well being rely on cross-sectional designs, limiting causal inference. Alimoradi et al. (2022) and Pan et al. (2020) both noted the lack of longitudinal studies that can clarify directionality between Internet addiction and psychological outcomes. Additionally, measurement heterogeneity (varying IAT cut-off scores, different PWB instruments) complicates cross-study comparisons. Many studies focus primarily on student populations,

leaving older adult samples underrepresented (Arayıcı et al., 2025). There is also limited use of objective sleep measures, such as actigraphy, which could provide more accurate assessments of sleep patterns (Lu, 2023). Future research should employ longitudinal, multi-method designs to explore mediating mechanisms (e.g., sleep, coping strategies) and moderating variables (e.g., age, gender, type of internet activity).

Hypotheses

Ho1: There would be no relationship between of Internet Addiction and sleep Quality among adult age group.

Ho 2: There would be no relationship between of internet addiction and psychological well-being among adult age group.

Ho3: There would be no relationship between sleep quality and psychological well being among adult age group.

Ho4: There would be no effect of internet addiction on sleep quality among adult age group.

Ho5: There would be no effect of internet addiction on psychological well-being among adult age group.

Ho6: There would be no interaction effect between internet addiction and Psychological wellbeing on Sleep quality among adult age group.

Method

Ex-post facto research design was used for the present study. Snowball sampling technique was followed. Data were collected from the participants with the help of Google form. The form consisted of sub forms. For collection of data, link of the Google form was circulated among different age adult groups. Link was sent via WhatsApp, Gmail and Telegram applications.

Sub Forms:

- ❖ *Form A:* Consist of personal details of the person like name, age, gender, email id, the name of the institution they are presently studying.
- ❖ *Form B:* Consent Form where the student is giving the consent to be a participant of the study
- ❖ *Form C:* It consisted of Internet Addiction Test
- ❖ *Form D:* Sleep Quality Scale
- ❖ *Form E:* Psychological Well-being Scale

Sample

Data were collected from 121 Adults (Male = 69, Female = 52). Following exclusion and inclusion criteria were maintained for the present study.

Exclusion Criteria:

1. Data collected from under 27 years were excluded, to minimize the sampling error.

2. Data collected from above 45 years were excluded from the sample.
3. Data collected from psychiatric patients or clients were excluded from sample.
4. Data Collected from chronic physical illnesses were excluded from the sample.
5. Data collected from irregular internet users (less than one hour per day) were excluded from sample.
6. Data collected from incomplete response provider were excluded from the sample.

Inclusion Criteria:

1. Data collected from 27-45 years adults were included for the sample.
2. Data collected from regular internet users (at least one hour per day) were included for any purpose (work, education, or leisure).
3. Data collected from those who were able to read and understand English (as the standardized tools were administered in English) were included.
4. Data collected from the individuals who provided informed consent to participate in the study were included and finally, data collected from 100 adults were included as sample.

Tools

Internet Addiction Test

The Internet Addiction Test (IAT) was developed by Dr. Kimberly Young (1998) to assess the level of an individual's internet use and its impact on daily life. It is one of the most widely used standardized tools for measuring internet addiction. The IAT consists of 20 self-report items, rated on a 5-point likert scale (from 1 = rarely, 2 = occasionally, 3 = frequently, 4 = often, and to 5 = always). It evaluates the degree of problematic internet use in areas. Scoring such as, 20–49: Average online user, 50–79: Occasional or frequent problems due to internet use, 80–100: Significant problems indicating possible internet addiction. The IAT demonstrates high internal consistency (Cronbach's $\alpha \approx 0.90$) and good validity across cross-cultures.

Sleep Quality

The Pittsburgh Sleep Quality Index (PSQI) was employed to evaluate sleep quality over the past month. Widely used for this purpose, the index consists of 19 self-assessed items and 5 items assessed by others, with 18 of the self-assessed items contributing to the overall score. These items are grouped into seven components: subjective sleep quality, time taken to fall asleep, duration of sleep, sleep efficiency, sleep disturbances, use of sleep medication, and daytime

dysfunction. The PSQI score can reach a maximum of 21 points, with higher scores indicating poorer sleep quality. A score exceeding 5 points suggests a sleep disturbance. The PSQI is known for its high internal consistency, with a Cronbach's alpha of 0.765.

Psychological Well-Being

Carol D. Ryff introduced the Psychological Well-Being Scale (PWB) in 1989 to evaluate positive psychological functioning and overall mental health, extending beyond merely the absence of illness. This scale examines how individuals perceive themselves and their lives. The original version consists of 84 items, while a shorter 18-item version is also commonly used. Responses are rated on a 7-point Likert scale, from strongly agree to strongly disagree. The scale encompasses six subscales: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. The scoring is as follows: 1 = strongly agree; 2 = somewhat agree; 3 = a little agree; 4 = neither agree nor disagree; 5 = a little disagree; 6 = somewhat disagree; 7 = strongly disagree. Higher scores reflect greater psychological well-being. The PWB exhibits high internal consistency (Cronbach's $\alpha = 0.86-0.93$) and strong construct validity. This scale has been extensively validated across different cultures and age groups.

Results

The data were analyzed using descriptive (Mean and SD) as well as inferential statistical techniques (Coefficients of correlation and regression) And Two-way Analysis of Variance. The aims of the studies were to determine the relationship between Internet addiction, sleep quality and psychological well-being and to find out if internet addiction has any effect on sleep quality and psychological well-being. And to find out if internet addiction and psychological well-being have any interactional effect on sleep quality and to find out if internet addiction and sleep quality have any interactional effect on psychological well-being. For this purpose, data was collected from 100 adults.

Table 1: Table showing the Means and SDs (N=100)

	Mean	SD
Internet addiction	52.89	11.57
Sleep quality	8.35	2.99
Psychological well-being	63.54	15.32

Score Range: (High score indicates greater internet addiction and high sleep disturbance and greater Psychological well-being vice versa)

Internet Addiction: 0-30

Sleep Quality: 0-5

Psychological Well-being: Higher score indicate high psychological well-being.

Table 1 indicates that the mean score of internet addiction on a higher side, whereas the mean score of sleep disturbance is moderately high and the mean score of psychological well-being also in higher side.

Table 2: Summary of Coefficients of Correlation

	Internet Addiction	Sleep Quality	Psychological Well-being
Internet Addiction	1	-	-
Sleep Quality	.486	1	-
Psychological Well-being	-.603	-.701	1

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

Relationship between Internet addiction, Sleep quality and psychological well-being are significant.

Discussion

The results showed significant positive relationship between internet addiction and poor sleep quality in 0.01 level. Also, inversely correlated between psychological well-being and sleep quality, internet addiction using Pearson product moment correlation and significant in 0.01 level.

And it has been found that there is a significant positive effect of internet addiction on sleep quality significant in 0.01 level but value is not satisfactory. And it has been found that there is a significant positive effect of internet addiction on psychological well being and effect of sleep quality on psychological well-being are significant in 0.01 level but value is average.

And it has been found that there is a significant effect of interaction between internet addiction and irregular sleep schedule and late night online activities. Other hand side in India the employment rates are in

Table 3: R, R² and adjusted R²

Independent Variable	Dependent Variable	R	R ²	B	Adjusted R Square	S.E of the Estimate	F	df	p-value
Internet Addiction	Sleep Quality	0.486*	.236*	.126	.228	2.62894	30.304	1	<0.01
Internet Addiction	Psychological Well-Being	.603*	.363*	-.798	.357	12.28654	55.928	1	<0.01
Sleep Quality	Psychological Well-Being	.701*	.491*	-3.588	.486	10.98204	94.669	1	<0.01

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

Table 4: Showing interaction calculation & result using Two-way ANOVA

Variables	R	R Square	Df	F value	p-value
Internet addiction* Psychological well-being	.603*	.363*	16	17.093	0.019**

*Correlation is significant at 0.01 level, **Correlation is significant at 0.05 level

Predictor: Internet addiction Psychological Well-being

Dependent Variable: Sleep Quality

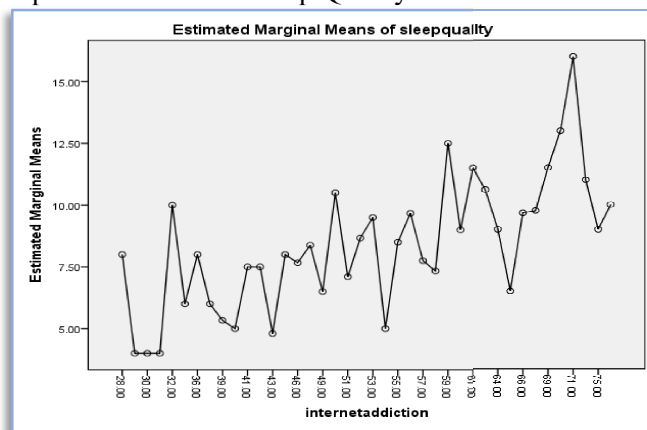


Figure 1: The plot of the mean "Sleep Quality" scores for group of "Internet Addiction"

psychological well-being on sleep quality using Two-way ANOVA. It is significant in 0.05 level.

The present study examined the associations between Internet addiction, sleep quality, and psychological well-being among adult age group. The findings revealed that higher levels of Internet addiction were significantly associated with poorer sleep quality and lower psychological well-being. This research finding suggests that high internet dependency affects the sleep pattern because of prolonged used of screen time,

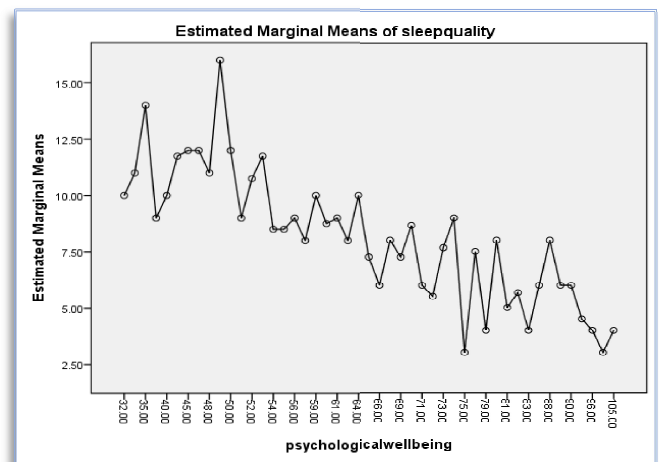


Figure 2: The plot of the mean "Sleep Quality" scores for group of "Psychological Well-being"

lesser side, some of the person are using internet for their stress reliever and also for their enjoyment. High internet addiction can leads to poor psychological well being due to the hampered of daily routines, reducing in face to face social interaction and majorly social isolation. Poor sleep quality disturbs our psychological well being hampered our emotional regulation, aggravates stress and reduce life satisfaction.

These findings are consistent with earlier studies indicating that excessive Internet usage can interfere with sleep patterns and adversely affect mental health (Kuss & Griffiths, 2017; Lam, 2014). Higher Internet addiction scores reported poorer sleep quality, supporting the notion that excessive internet use interferes with healthy sleep routines. Overuse of digital equipments, particularly television and mobiles using before bedtime, exposure of individuals to blue light that suppresses melatonin production, delaying onset of sleep and reducing sleep efficiency and hampered circadian rhythm (Exelmans & Van den Bulek, 2016). Middle-aged adults, often balancing occupational and familial responsibilities and relationships, may use the Internet as a coping mechanism or means of relaxation, unintentionally leading to bedtime procrastination and irregular sleep routines. This finding corroborates previous studies that identified a significant association between overuse internet and social media causing insomnia-like symptoms (Chen & Gau, 2016). A significant inversely correlation between Internet addiction and psychological well-being was observed. This suggests that individuals with higher digital dependency tend to experience lower levels of life satisfaction, self-acceptance, and positive interpersonal relationships. These results echo the findings of Tokunaga and Rains (2010), who emphasized that a type of internet addiction called compulsive internet behavior often leads to social isolation and emotional exhaustion. Excessive online engagement may replace meaningful offline societal interactions, fostering loneliness and reducing psychological resilience, self-efficacy. Moreover, constant exposure to social media, digital equipment and online comparisons may amplify feelings of inadequacy and stress, further undermining well-being (Kross et al., 2013). The study also found that poor sleep quality was significantly associated with lower psychological well-being. Adequate sleep is essential for emotional regulation, cognitive performance, and stress management. This study, in line with previous findings by Palmer and Alfano (2017), confirms that sleep disruptions lead to mood swings, decreased motivation, and heightened psychological distress. Middle-aged adults, already facing occupational and familial stress, may be particularly vulnerable to the compounding effects of poor sleep on mental health.

Interestingly, the interaction analysis suggested that Internet addiction may indirectly impact psychological well-being through its effect on sleep quality. This

mediating relationship supports the theoretical framework of the “Compensatory Internet Use Model” (Kardefelt-Winther, 2014), which proposes that individuals use the Internet excessively to escape stress or negative emotions, ultimately worsening sleep quality and well-being over time.

H1 stated that “There would be no relationship between of Internet Addiction and sleep Quality among Middle adult aged group” was rejected as the results clearly revealed that positive relationship between internet addiction and sleep quality.

H2 stated that “There would be no relationship between of internet addiction and psychological well-being among middle adult aged group” was rejected as the results clearly revealed that negative relationship between internet addiction and psychological well-being.

H3 stated that “There would be no relationship between sleep quality and psychological well being among Middle adult aged group” was rejected as the results clearly revealed that negative relationship between sleep quality and psychological well-being.

H4 stated that “There would be no effect of internet addiction on sleep quality among Middle adult aged group” was rejected as the results clearly revealed that internet addiction have an effect on sleep quality.

H5 stated that “There would be no effect of internet addiction on psychological well-being among Middle adult aged group” was rejected as the results clearly revealed that internet addiction have an effect on psychological well-being.

H6 stated that “There would be no interaction effect between internet addiction and Psychological wellbeing on Sleep quality among Middle adult aged group” was rejected as the results disclosed that positive interaction effect between internet addiction and psychological well-being on sleep quality.

Conclusion

The current research revealed notable links between internet addiction, sleep quality, and psychological well-being in adults. It was observed that higher internet addiction levels were associated with poorer sleep quality, suggesting that excessive internet usage might result in disrupted or inadequate sleep. Furthermore, psychological well-being showed an inverse relationship with both internet addiction and poor sleep quality, indicating that individuals with better well-being are less prone to internet addiction and sleep issues. The coefficient of determination (r^2) values demonstrated that internet addiction, sleep quality, and psychological well-being are moderately

and significantly interconnected at the 0.01 level, highlighting a meaningful interdependence among these factors. Additionally, the two-way ANOVA results indicated a significant interaction effect between internet addiction and psychological well-being on sleep quality at the 0.05 level, suggesting that the combined impact of internet addiction and psychological well-being is crucial in determining sleep quality.

References

- Ahmed O, Erin I. Walsh, Amy Dawel, Khawlah Alateeq et.al (2024) Social media use, mental health and sleep: A systematic review with meta-analyses. *Journal of Affective Disorders*. 367, 701-712. <https://doi.org/10.1016/j.jad.2024.08.193>.
- Alimoradi Z, Lotfi A, Lin CY, Griffiths MD, Pakpour AH.(2022) Estimation of Behavioral Addiction Prevalence During COVID-19 Pandemic: A Systematic Review and Meta-analysis. *Current Addiction Report*. 9(4), 486-517. doi: 10.1007/s40429-022-00435-6
- Arayici ME, Gultekin Arayici S, Erkin Geyiktepe O, Simsek H.(2025) Assessment of the Relationship Between Internet Addiction, Psychological Well-Being, and Sleep Quality: A Cross-Sectional Study Involving Adult Population. *Behavioral Sciences (Basel)*.15(3):344. doi: 10.3390/bs15030344
- Guo C, Chen M, Ji X, Li J, Ma Y, Zang S.(2025) Association between internet addiction and sleep quality in medical students: a longitudinal study. *Frontiers Psychology*.16:1517590. doi: 10.3389/fpsyg.2025.1517590
- Kuss, D. J., Griffiths, M. D. (2017). Internet addiction: A systematic review of epidemiological research. *World Journal of Psychiatry*, 23(2), 151–156.
- Li Q, Yang C, Zhao Z, Yang C, Chen Z, Huang D, Yin W.(2024) The relationship between Internet use and loneliness of middle-aged and older adult people: the moderating effect of residence. *Frontiers Public Health*.12:1284180. doi: 10.3389/fpubh.2024.1284180.
- Lin, Pin-Hsuan & Lee, Ya-Chen & Chen, Kai-Li & Hsieh, Pei-Lun & Yang, Shang-Yu & Lin, Ying-Lien. (2019). The Relationship Between Sleep Quality and Internet Addiction Among Female College Students. *Frontiers in Neuroscience*. 13. 10.3389/fnins.2019.00599.
- Lu JX, Zhai YJ, Chen J, Zhang QH, Chen TZ, Lu CL, Jiang ZL, Guo L, Zheng H. (2023) Network analysis of internet addiction and sleep disturbance symptoms. *Progress in Neuro-psychopharmacology Biological Psychiatry*.125:110737. doi: 10.1016/j.pnpbp.2023.110737.
- Pan, Y.-C., Chiu, Y.-C., & Lin, Y.-H. (2020). Systematic review and meta-analysis of epidemiology of internet addiction. *Neuroscience and Bio-behavioral Reviews*,118, 612–622. <https://doi.org/10.1016/j.neubiorev.2020.08.013>
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57(6), 1069–1081. <https://doi.org/10.1037/0022-3514.57.6.1069>
- Sharma A, Sharma R. (2018) Internet addiction and psychological well-being among college students: A cross-sectional study from Central India. *Journal of Family Medicine and Primary Care*. 7 (1):147-151. doi:10.4103/jfmpe.jfmpe_189_17. <https://www.psychologytoday.com/us/basics/sleep>

