

# The Relationship Between Internet Use and Mindful Attention in College Students

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[doi.org/10.64643/IJIRTV1218-191235-459](https://doi.org/10.64643/IJIRTV1218-191235-459)

**Abstract**—In today's world have become an essential part of daily life. especially for college students. while they make communications and learning easier, their constant use may affect how well people stay focused and aware in the present moment. This study explored how internet use related to mindful Attention in college students. Thirsty students between 18 and 25 years old took part in online survey include two tools internet addiction scale to measure and The Mindfull attention awareness scale to assess mindfulness. The the result showed a clear negative link between the two students who used their internet more often tended to be Less mindful future analysis confirmed that high internet uses had noticeably lower mindfulness scores compared to those who used their internet less. These findings supports that spending too much time on internet may reduce present moment.

**Index Terms**—internet addiction, Mindful Attention, Mindfulness, Screen Time, Young Adults, Digital Habits

## I. INTRODUCTION

A growing portion of teenagers' leisure time is utilized on internet use screens, including smartphones, tablets, gaming consoles, and televisions. (Common Sense Media, 2015; Twenge et al., 2019), bringing concerns about the effects of screen time on the well-being of parents, healthcare providers, and educators. (e.g., Kardaras, 2017). The World Health Organization has included gaming disorder in the 11th edition of the International Classification of Diseases. (WHO, 2018).

In the past decade, internet use have become integral to modern life, especially for college students who rely on them not just for communication but for social networking, learning, entertainment, and daily organization. While these devices offer undeniable convenience and efficiency, their pervasive use has

also sparked growing concerns about their effects on cognitive health, particularly on attention and mindfulness (Rosen et al., 2013; Montag et al., 2015). With increasing screen dependence, researchers are beginning to explore the long-term psychological costs of sustained internet use.

In today's fast-paced and competitive era, psychological research can be useful. There are many types of problems where humans live. And research is carried out as a solution to those problems. And such research provides inspiration to do some new research. In the present time, many psycho-social problems are arising. Therefore, research has become indispensable as a solution to them. The right path is found through research. And new research gets scope from many researches.

The modern era is known as the era of knowledge and information. Mass media has had such an impact on the people of every society that it is difficult to say what the situation of the public would be in its absence. Mass media like newspapers, magazines, books, films, television, smartphones, and the Internet etc. have had a profound impact on human life.

### 1. Internet addiction:-

Internet is a medium in the world that provides important information and entertainment facilities. But excessive use of Internet becomes harmful in the current life in terms of physical and mental development. A person gets satisfaction from its use, but if he does not use it regularly, he experiences anxiety, panic, etc.

Generally speaking, if a person is constantly doing activities on the Internet and if the Internet is removed from him for some time, he becomes anxious and stressed, then it can be called Internet addiction.

Internet addiction is mainly known as Internet-related dependence. It is known by different names such as

Internet addiction disorder Goldberg (1996) Internet addiction Kimbley S. Young(1998) and Internet pathological use Lynn and Desai (2002).

“Internet addiction is such a mental dependence on the Internet that one has to log in once for the activity.

- Candley (1998)

“Internet addiction is characterized by excessive or poorly controlled preoccupation with computer-related impulses or behaviours that lead to harm or distress.”

Saw and Black (2008)

Individual gives more important to Internet and networking sites such as Facebook, Instagram, Twitter, WhatsApp, YouTube, WeChat, Viber, and other apps than their daily tasks. That is, according to the ‘Global Web Index’, every Indian spends 2 hours and 40 minutes on the Internet every day. That is, 80 hours in a month and 864 hours in a full year. In this sense, 40 days of the year are spent only on the Internet.

2. Attention, a key component of cognitive functioning, refers to the ability to selectively focus on relevant stimuli while filtering out distractions (Posner & Petersen, 1990). In contrast, mindfulness involves being present and fully engaged with the moment, fostering a non- reactive and aware mental state (Kabat-Zinn, 2003). These two constructs are interrelated, as mindfulness practices have been shown to improve attention regulation (Tang et al., 2007). However, the habitual use of smartphones may compromise these cognitive faculties. Notifications, multitasking, and rapid information consumption inherent to smartphone use can fragment attention and encourage shallow processing (Ophir et al., 2009). Repeated exposure to such digital environments may decrease one’s capacity to remain present, thus undermining mindfulness.

Neuroscientific studies have provided early evidence of structural and functional brain changes associated with digital multitasking and problematic smartphone use. For instance, excessive smartphone users have shown altered activity in the prefrontal cortex an area responsible for attention control, impulse regulation, and decision-making (Horvath et al., 2020). These neurological changes may explain why young adults often report feeling mentally fatigued or distracted despite resting. Moreover, smartphone overuse has

been linked to increased symptoms of anxiety, depression, and attention deficit (Elhai et al., 2017; Demirci et al., 2015), suggesting that mental well-being and attentional functioning are deeply intertwined.

In addition to cognitive and neural concerns, behavioral scientists highlight that smartphone use often fosters compulsive checking and fear of missing out (FoMO), both of which lead to frequent attentional shifts and diminished self-awareness (Przybylski et al., 2013). According to self-determination theory, such compulsions can disrupt intrinsic motivation and reduce psychological well-being by weakening autonomy and competence (Deci & Ryan, 2000). As mindfulness is grounded in self-regulation and present-moment focus, these compulsive digital behaviors can potentially erode the foundation upon which mindful attention is built.

Importantly, the impact of internet use on mindfulness may not be uniform. Context matters. Internet use for productive or mindful purposes, such as meditation apps or educational content, may not carry the same risks as passive scrolling or gaming (van Deursen et al., 2015). However, the majority of young adults engage in screen time driven by social validation, entertainment, and distraction rather than purposeful engagement. These behavioral tendencies create what some scholars refer to as a “digital attention economy,” wherein attention is commodified, leading users to unintentionally surrender their cognitive resources to apps designed to exploit attentional vulnerability (Williams, 2018).

Given these trends, it is crucial to understand how habitual internet use may relate to mindful attention in college students. While some studies have examined these concepts independently, few have analyzed their interrelationship directly, especially in the Indian context. This research addresses this gap by empirically examining the connection between internet and smartphone screen time and mindfulness in college students. By doing so, it not only adds to the academic literature but also provides practical implications for educators, therapists, and policy makers concerned with digital hygiene and mental health promotion.

Mindfulness involves being present and focused in the current moment (Schuman-Olivier et al., 2020). Undoubtedly, technology has many advantages, but

there are also concerns about how it may affect cognition, particularly attention. Long-term screen time has been linked in the past to mental exhaustion, reduced mindfulness, and poor cognitive flexibility. According to previous investigations, excessive screen use is associated with reduced mindfulness, less cognitive flexibility, and mental exhaustion. (Lin et al., 2020; Twenge & Campbell, 2018). Moyer (2016) and Chassiakos (2016) researched the impact of digital media usage on young people's cognitive growth. According to other research by Fillmore (2014), Haxel (2022), Lissak (2018), and Tripath (2020), prolonged screen use may be a factor in decreased focus and attention. Direct comparative studies that examine the variations in attention between people who use screens a lot and those who don't are still necessary. This research intends to explore these distinctions by examining the attention of young adults who experience high amounts of screen time versus those with lower usage. By focusing on this area, the study aims to add to the expanding literature concerning the cognitive impacts of digital consumption.

## II. SIGNIFICANCE OF THE STUDY

The growing use of internet addiction in college students has raised important questions about its effects on mental and cognitive health. This study is significant because it explores the relationship between internet addiction and mindful attention two important aspects that influence focus, productivity, and emotional well-being. Understanding this relationship is especially important in today's digital world, where young people often spend several hours a day on their phones, sometimes without realizing its impact on their ability to stay present and attentive.

By comparing individuals with high and low internet usage, this research aims to provide insights into whether excessive screen time is linked to reduced mindfulness and attention levels. These findings can help students become more aware of their digital habits and encourage healthier usage patterns. Educators and mental health professionals can also benefit from this study by developing awareness programs, classroom strategies, and counseling methods to promote mindfulness and focus college students.

Additionally, this research contributes to the existing

psychological literature by highlighting the cognitive effects of modern technology, particularly within the Indian context. Since most previous studies have focused on Western populations, this study provides valuable data specific to Indian college students helping make global research more inclusive and culturally relevant.

In summary, the study holds practical and academic value by addressing a timely issue that affects academic performance, mental health, and daily functioning among the youth. The findings may guide further research, educational policies, and personal behavior changes that promote digital well-being and mindful living.

In the digital age, smartphones have emerged as an essential tool in the daily lives of young adults, serving multiple functions from social interaction to academic assistance. However, their endless raises concerns about their impact on cognitive processes, particularly mindful attention. Mindfulness is defined as a receptive attention to and awareness of present experiences (Brown & Ryan, 2003), a quality that may be undermined by constant digital engagement. The use of smartphones has been associated with experiential avoidance, reduced attention regulation, and compulsive checking behaviours, all of which may impair mindfulness. The conceptual model tested by Woodlief et al. (2024) shows that behavioural and cognitive involvement with smartphones leads to a decreased capacity for mindful attention. Similarly, Cheng et al. (2020) demonstrated that late-night smartphone use correlates negatively with mindfulness, with self-control and rumination as mediators.

Although there is increasing empirical interest, there are still some gaps. To begin with, not many studies utilize objective usage data or longitudinal approaches, which are crucial for determining causality. Secondly, a significant portion of the research concentrates on Western groups, which restricts the applicability of the results. Lastly, the function of mindfulness as both a mediator and a moderator in this connection is not well-researched, highlighting the need for further investigation into its protective benefits.

Cheng et al. (2020) used a cross-sectional design with 270 college students to test the mediation model of mindfulness, self-control, and rumination in predicting smartphone addiction. The research shows significant negative relationships correlations between mindfulness and smartphone use before sleep. However, its reliance on self-reports limits causal interpretation.

Woodlief et al. (2024) conducted two studies using both self-report and objective smartphone usage metrics. Their planned missingness design and conceptual model offered a shallow view of smartphone involvement. Despite strong methodology, the study was cross-sectional and lacked cultural diversity.

Zhang & Wang (2022) proposed a moderated mediation model in a sample of 763 college students, showing that experiential avoidance mediates the effect of stress on smartphone use, moderated by trait mindfulness. The research offered strong statistical analysis but failed to account for the use specific to each app.

Saha et al. (2024) undertook a cross-sectional analysis of 423 Indian medical students. Over 80% showed high smartphone use, with over 52% showing low mindfulness. Though rich in demographic diversity, the study was purely descriptive and lacked theoretical modelling.

Uniyal & Shahnawaz (2022) examined a serial mediation model in which mindfulness and self-compassion acted as mediators in the connection between wellbeing and problematic smartphone usage. This research contributed to the advancement of theory but relied only on correlational data.

Haschke et al. (2018) shows how short mobile mindfulness exercises impact depression, anxiety, and stress levels among college students. The study found no significant differences across conditions, pointing to limitations in the efficacy of short-term interventions.

Zhao et al. (2022) highlighted how smartphone usage

can serve as a means of avoiding experiences and suggested that mindfulness could act as a moderating factor. The results they obtained were convincing; however, the use of a single-culture sample restricted its wider relevance.

Mondal et al. (2023) examined the mindfulness levels and smartphone habits in Kolkata medical students. The results highlighted the worldwide significance of the matter but were limited by a lack of psychometric depth in measurement tools. The addictive tendency associated with smartphone usage frequently arises from a psychological need for social validation. This manifests in frequent checking of social media for likes, comments, and messages, which strengthens the reliance on external validation and diminishes internal awareness. Woodlief et al. (2024) and Uniyal & Shahnawaz (2022) emphasized this route, demonstrating that social comparison and a lack of self-compassion serve as mediators for the adverse effects of smartphone usage.

The ability to multitask on smartphones leads to divided attention spans. Cheng et al. (2020) and Haschke et al. (2018) discovered that excessive use of smartphones, particularly before sleep, worsens rumination and leads to decreased self-control. This interferes with sleep health and emotional stability, both of which are essential for maintaining focused awareness.

Demographic elements like gender, housing situation, and cultural heritage greatly influence the connection between mindfulness and smartphone usage. Saha et al. (2024) discovered that female students living in hostels exhibited greater levels of mindfulness. However, the majority of studies do not incorporate intersectional analysis, restricting a more nuanced comprehension.

Future studies ought to focus on longitudinal and experimental methods to more effectively determine causality. Incorporating objective usage data from smartphones along with ecological momentary assessments will improve validity. Interventions should explore app-based mindfulness training tailored to individual usage patterns. Cross-cultural research and studies addressing demographic moderators like gender, education level, and socio-

economic status are also vital. Ultimately, differentiating between various types of smartphone usage academic, social, or entertainment can help identify which behaviors are most harmful to focused attention.

The connection between smartphone usage and mindfulness among young adults is intricate and has multiple facets. Although initial results indicate an inverse relationship, further detailed investigation is necessary to clarify the causal mechanisms. Mindfulness continues to be a hopeful shield against the cognitive and emotional disturbances associated with extensive digital interaction. Strong, interdisciplinary research is crucial for creating efficient, widely-implementable strategies that promote healthier technology behaviors in adolescents.

### III. RESEARCH QUESTION

What is the relationship between internet use and mindful attention in college students.

Objective:

To examine the relationship between internet use and mindful attention in college students.

Hypotheses

H1: There is a significant negative relationship between internet use and mindful attention in college students.

Research Design

This study employed a cross-sectional, correlational research design using quantitative methodology. Data were collected through a structured online survey, which included standardized psychological instruments and demographic questions. The design allowed for the exploration of associations between Instagram usage patterns and self-esteem without manipulating variables

Participants

The research was conducted on a sample of 30 undergraduate college-going students, out of which 19 (63.3%) were female participants and 11 (36.7%) were male participants. The mean age of the participants was 20.53 years. Sampling for the study was done

using an online survey form, and participants were selected through random sampling based on their availability and willingness to take part in the research.

Inclusion Criteria

- Participants should be within the 18–25 age group.
- Participants should be college students.
- Participants who volunteered to be part of the research.

Exclusion Criteria

- Participants below 18 or above 25 years of age.
- Participants who were not enrolled in any college
- Participants who did not consent or volunteer to take part in the research.

### IV. MEASUREMENTS

The online survey consisted of three segments: demographic questions related to age, gender, and education level, an assessment of internet addiction using and an assessment of mindfulness using the Mindful Attention Awareness Scale (MAAS).

[4] Questionnaire: Participants were asked to provide basic details including age, gender, and educational status. These details were used to ensure that all participants met the inclusion criteria and to understand the distribution of the sample.

- Internet Addiction Scale :-

To measure internet addiction among college students, the Internet Addiction Questionnaire developed by Young (1998) and translated into Gujarati by Pandya (2014) was used. This scale has a total of 20 statements. This scale is of 5-point response type. The reliability of this scale is 0.87 and the validity of this scale appears to be very high.

- Mindful Attention Awareness Scale (MAAS): The MAAS (Brown & Ryan, 2003) is a widely used 15-item self-report questionnaire designed to assess the general tendency to be attentive and aware of present-moment experiences. Items are rated on a 6-point Likert scale from 1 = Almost Always to 6 = Almost Never, with higher scores indicating greater levels of dispositional

mindfulness. The MAAS has shown excellent psychometric properties, with high internal consistency (Cronbach's  $\alpha = 0.80-0.90$ ) and good validity across diverse populations, including students and working adults.

Correlational research is a type of study design that investigates the strength and direction of relationships between two or more variables without manipulating them. This design was appropriate because the goal was to determine whether increased internet addiction usage is associated with lower levels of mindful attention, as measured through standardized self-report tools.

#### Procedure

An online survey form was created using Google Forms to collect data for the research. The form consisted of three sections. The first section included questions related to the demographic details of the participants, such as name, age, gender, and educational qualification.

The second section included internet addiction Scale, where participants were asked to rate the frequency of their smartphone usage and screen-related behaviors on a 5-point Likert scale ranging from 1 (Never) to 5 (Always). The third section included the Mindful Attention Awareness Scale (MAAS). Participants were asked to rate their attention and awareness in daily life using a 6-point Likert scale, where 1 = Almost Always and 6 = Almost Never. This section measured the participants' level of mindfulness. A total of 100 participants were selected for the study based on the inclusion criteria. All respondents were

between 18 to 25 years of age and were currently enrolled in college-level education. The mean age of the participants was 20.53 years.

Based on their responses on the internet addiction, participants were divided into two groups: those with high internet usage and those with low internet usage. MAAS scores were then analyzed to assess levels of mindful attention among the two groups. Data were scored and analyzed using Pearson's correlation to examine the relationship between internet use and mindful attention.

#### Data Analysis

The demographic details of the participants were collected through an online survey form. The mean age of the participants was 23.43 years. All 100 participants were college students, of which 50 were male and 50 were female. A majority of the participants were undergraduate students while the rest were postgraduate students.

Participants reported their average daily screen time. Based on their responses:

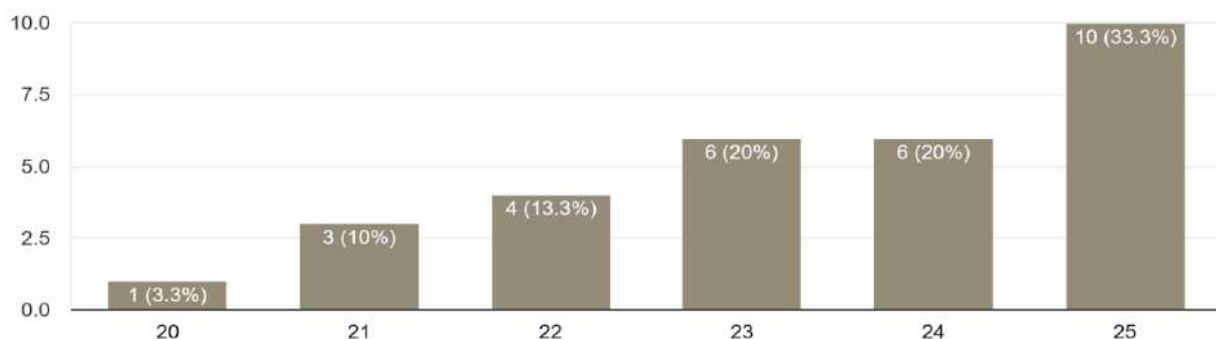
- 50 participants (56.7%) reported using their smartphones for 6+ hours daily
- 50 participants (30%) reported 4–6 hours
- 3 participants (10%) reported 2–4 hours
- 1 participant (3.3%) reported using it for less than 2 hours

#### Age Groups

- 18-20 years: 8 participants (26.7%)
- 21-23 years: 14 participants (46.7%)
- 24-25 years: 8 participants (26.7%)

#### Age

30 responses

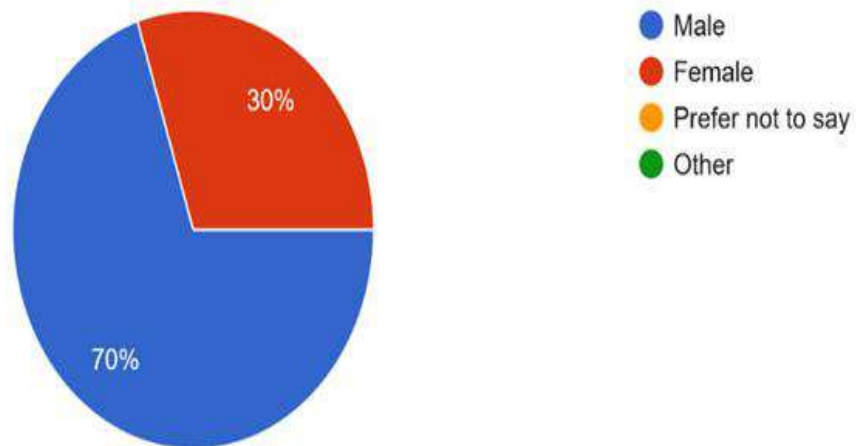


#### Gender Distribution

- Male: 50 participants
- Female: 50 participants

#### Gender

30 responses

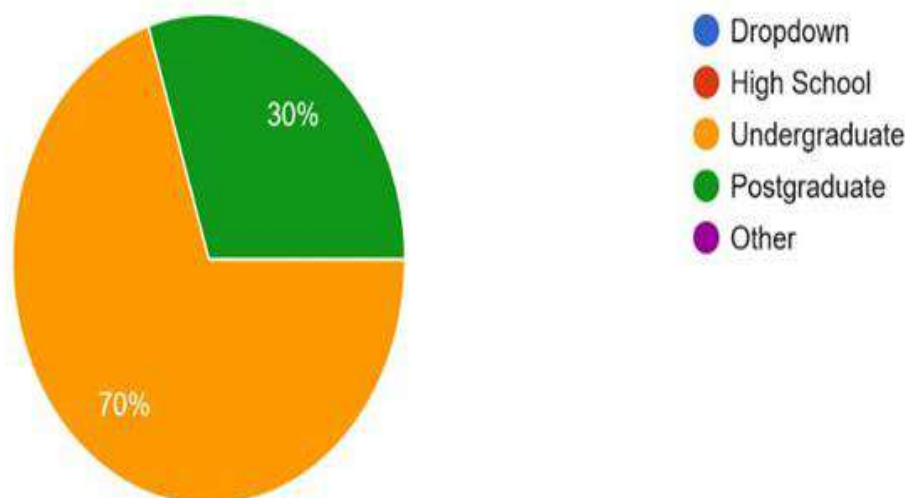


#### Education Level

- Undergraduate: 100 participants

#### Education Level

30 responses



#### Daily Smartphone Usage (Screen Time)

- Low Usage (<4 hours/day): 6 participants (20%)

- 2-4 hours: 6 Moderate Usage (4-6 hours/day): 10 participants (33.3%)
- High Usage (6+ hours/day): 14 participants (46.7%)

### Daily Screen Time (Hours)

30 responses

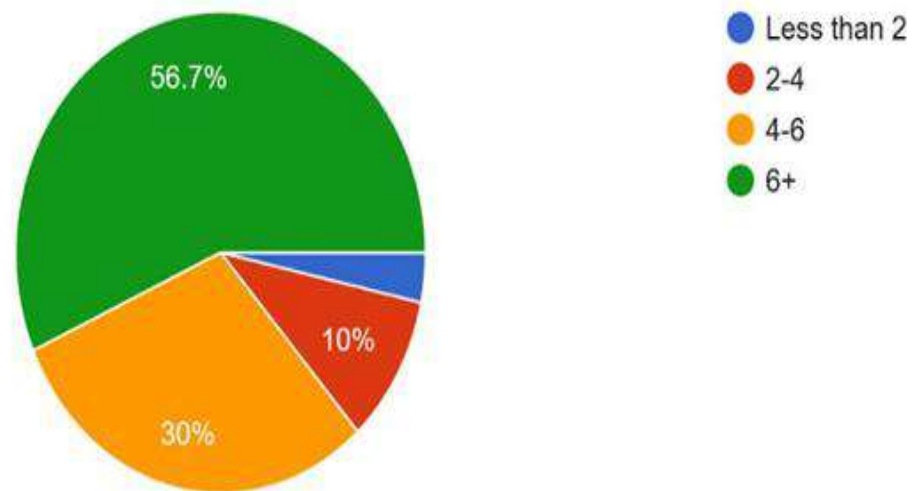


Table 1: Frequency and Percentage Distribution of Participants (N = 100)

Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	21	70%
	Female	9	30%
Education Level	Undergraduate	21	70%
		9	30%
Daily Screen Time	Less than 2 hours	1	3.3%
	2-4 hours	3	10%
	4-6 hours	9	30%
	6+ hours	17	56.7%

Table 2: Descriptive Statistics for MTUAS and MAAS Scores (N=30)

Variable	Minimum	Maximum	Mean	SD
INTERNET ADDICTION	38	79	60.67	9.86
MAAS (Mindful Attention)	40	79	58.53	10.44

To examine group-level differences, participants were split into high and low smartphone use groups using a median split on MTUAS scores (Median = 61). Those scoring above 61 were categorized as high users (n = 15), and those scoring 61 or below were categorized

as low users (n = 15).

#### Correlation Analysis

A Pearson product-moment correlation was conducted to explore the relationship between internet use and



mindfulness. Results revealed a significant negative correlation,  $r(28) = -.624$ ,  $p < .01$ , indicating that higher smartphone use was associated with lower levels of mindful attention.

#### Group Differences in Mindfulness Based on internet Use

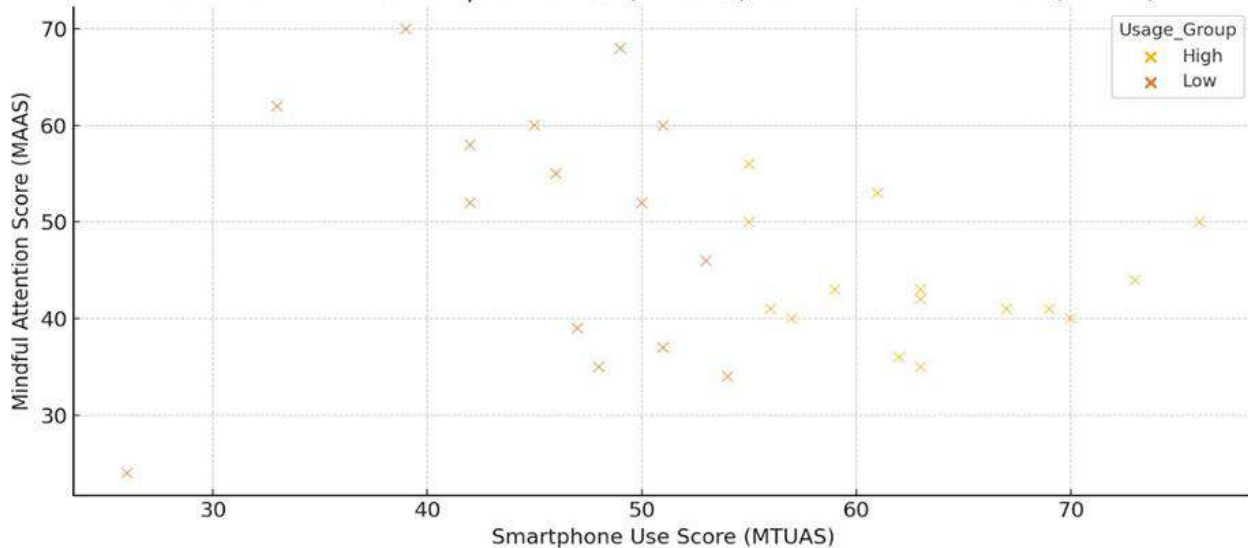
To further examine differences in mindfulness levels, an independent samples t-test was conducted comparing the MAAS scores of high and low smartphone use groups. The descriptive results are shown in Table 2. Table 3: Mindfulness Scores by internet Usage Group

Smartphone Use Group	n	MAAS Mean	SD
High Use	15	52.20	8.63
Low Use	15	64.87	7.12

The results of the t-test indicated a statistically significant difference in mindfulness between the two groups,  $t(28) = -4.34$ ,  $p < .001$ . Participants who reported higher levels of internet use had significantly lower mindfulness scores than those who used their internet less frequently. This supports the hypothesis that higher smartphone use is inversely related to mindful attention.

The bar graph illustrates the mean internet scores for participants categorized into high and low smartphone use groups. Participants in the low use group demonstrated significantly higher mindfulness ( $M = 64.87$ ,  $SD = 7.12$ ) compared to those in the high use group ( $M = 52.20$ ,  $SD = 8.63$ ). The difference was statistically significant, indicating that increased smartphone use is associated with reduced levels of mindful attention among young adults.

Scatter plot showing the relationship between internet addiction scores and mindful attention (MAAS scores):  
Scatter Plot of Smartphone Use (MTUAS) vs Mindful Attention (MAAS)



The graph displays a negative trend: as internet usage increases, the mindful attention score decreases.

The graph displays a negative trend: as internet usage increases, the mindful attention score decreases.

Participants are grouped by color:

- High internet users (orange) tend to have lower mindfulness.
- Low internet users (blue) generally show higher

mindfulness.

- X-axis: Represents the ID score, which measures internet usage. Higher values = more frequent use.
- Y-axis: Represents the MAAS score, which measures mindful attention. Higher values = greater ability to stay present and focused.
- Each dot: Represents a participant in the study.

● Colors:

● Blue dots: Participants in the low internet usage group.

● Orange dots: Participants in the high internet usage group.

Interpretation

The primary objective of the present study was to examine the relationship between internet use and mindful attention in college students. The study also aimed to determine whether there is a significant difference in the level of mindfulness between high internet users and low internet users.

To measure participants' usage, internet addiction Scale was used. The mean score was 60.67, which suggests that, overall, participants demonstrated a moderate to high level of smartphone use. To assess mindfulness, the Mindful Attention Awareness Scale (MAAS) was used. The mean MAAS score was 58.53, indicating an average level of mindful attention among participants.

A Pearson correlation was conducted to assess the relationship between internet use and mindful attention. The correlation coefficient obtained was  $r = -0.624$  with  $p < 0.01$ , indicating a significant negative relationship. This means that as smartphone use increases, mindfulness decreases. Therefore, the hypothesis H1: "There is a significant negative relationship between internet use and mindful attention in college students" is accepted.

To further analyze the differences between high and low internet users, a t-test was conducted. The t-value obtained was  $t(28) = -4.34$ , with  $p < 0.001$ , indicating a statistically significant difference in mindfulness scores between the two groups. Participants with lower internet usage ( $t \text{ score} \leq 61$ ) had higher mindfulness ( $M = 64.87$ ,  $SD = 7.12$ ) compared to those with higher usage ( $M = 52.20$ ,  $SD = 8.63$ ). This means that college students who use internet more frequently tend to be less mindful, while those who use them less frequently show greater attention and awareness in the present moment.

Previous research supports this finding. Studies by Cheng et al. (2020) and Woodlief et al. (2024) found that higher internet use is associated with reduced mindfulness and self-control. Similarly, Lin et al. (2020) reported that excessive screen time affects cognitive flexibility and attention regulation. This

suggests that continuous exposure to notifications, social media scrolling, and digital multitasking might distract individuals from the present and reduce their capacity for focused attention. One explanation for this relationship is the design of smartphones, which encourages constant checking, task-switching, and mental stimulation. Over time, this behavior can become automatic and interfere with the ability to stay present. Research by Ophir et al. (2009) and Horvath et al. (2020) also suggests that frequent media multitasking may alter brain regions related to attention and impulse control. These changes may explain why college students often report mental fatigue, anxiety, or difficulty concentrating even when they are not using their phones. The results of this study show that internet use is significantly related to mindfulness in college students. The findings highlight the importance of developing awareness around digital habits and promoting mindfulness practices to maintain psychological well-being.

This research shows a significant concern about the effects of internet use on mindful attention among college-going student. It was found that participants who had higher levels of internet usage had lower levels of mindful attention. On the other hand, participants with lower smartphone usage were more likely to be mindful and focused in their daily lives. This indicates that excessive smartphone use may negatively affect a young adult's ability to stay present, concentrate, and be self-aware.

It was observed that young adults who frequently use their smartphones especially for social media, messaging, and entertainment—tend to have more difficulty focusing on the present moment and become easily distracted. The constant notifications, app-switching, and digital multitasking may contribute to fragmented attention and a decline in mental presence. This supports previous research that suggests internet overuse may lead to poor attention regulation, emotional dysregulation, and even changes in brain functioning related to attention and decision-making.

A significant negative relationship was found between internet use and mindfulness, suggesting that as screen time increases, mindful awareness tends to decrease. This highlights the growing impact of digital technology on mental and emotional health, particularly among students who often rely on their phones for both academic and non-academic

purposes.

These findings underline the importance of promoting healthy digital habits, especially in academic and youth environments. Mindfulness training and digital well-being programs could help students become more aware of their screen time and improve their ability to stay focused and calm.

## VI. LIMITATIONS

As the study was conducted using a self-administered online survey, there is a possibility of response bias, as participants may not have answered truthfully or accurately. All data, including internet use and mindfulness, were based on self-report, which may have affected the reliability of the findings.

Another limitation is the small sample size of only 100 participants, which limits the generalizability of the results. A larger and more diverse sample would have given a clearer picture of the relationship between internet use and mindfulness.

In addition, the study did not take into account other factors such as personality traits, stress levels, or academic pressure, which might also influence mindfulness or internet use. The study was also limited to college students, so the findings may not apply to individuals outside this age group or educational context.

## VII. SUGGESTIONS FOR FUTURE RESEARCH

- Future research can be done with a larger sample size and include participants from different educational backgrounds and age groups.
- Further studies can also explore how other variables such as anxiety, sleep quality, or academic performance are related to smartphone use and mindfulness.
- Since mindfulness was found to be lower in participants with high smartphone use, intervention-based research can be conducted to examine whether mindfulness training or digital detox programs can help improve attention and reduce screen dependency.
- Future studies can also consider using objective data such as mobile usage tracking apps instead of self-reports to improve accuracy.
- More research should be done on the long-term

effects of smartphone use on cognitive functioning and emotional well-being among youth.

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