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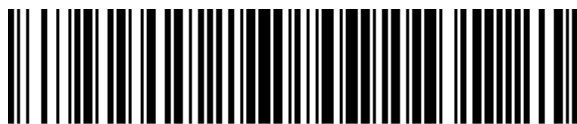
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PREFACE

It is with great pleasure that the **Seshadripuram Journal of Social Sciences (SJSS)** presents **Volume 7, Issue 1 (2) – March 2026: Special Student Issue**, dedicated to showcasing the scholarly contributions of student researchers. This special issue reflects the growing interest and active participation of students in academic research, providing a platform for them to present their ideas, explore contemporary issues, and engage with research across diverse areas of social sciences and allied disciplines.

The **Seshadripuram Research Foundation (SRF)** and the Editorial Board of SJSS sincerely appreciate the efforts of all participating students, faculty mentors, research coordinators, and supporting institutions who contributed to the development of this special issue. The contributions demonstrate the enthusiasm, curiosity, and emerging research capabilities of young scholars. We also acknowledge the valuable efforts of the reviewers, editors, and academic coordinators whose constructive guidance and careful evaluation have supported the quality and academic integrity of the published contributions.

We hope that this **Special Student Issue** will encourage students to pursue research with greater confidence, curiosity, academic responsibility, and methodological rigour. It is our sincere belief that providing opportunities for young researchers to disseminate their work will contribute to the development of a stronger and more sustainable research culture. SRF and SJSS remain committed to encouraging student research, academic mentorship, and meaningful scholarly engagement.

We extend our sincere appreciation to all **student authors, faculty mentors, reviewers, editorial members, and institutional collaborators** for their valuable contributions to this special issue. We look forward to continued efforts towards nurturing the next generation of researchers and strengthening the culture of scholarly inquiry.

With sincere gratitude and best wishes for continued academic collaboration.



Editor In Chief

Dr. S. N. Venkatesh

About Seshadripuram Educational Trust (SET)

The Seshadripuram Educational Trust (SET) is one of Karnataka's oldest and most respected educational charitable trusts, with a legacy that began in 1930 and a formal establishment in 1980. SET today manages a comprehensive network of institutions offering education from pre-school to postgraduate and research levels. Guided by its vision of "*Service to Education*," the Trust is committed to providing equitable, high-quality learning opportunities to students from diverse backgrounds. With its emphasis on academic excellence, value-based education, and societal progress, SET has played a transformative role in shaping thousands of learners across Bengaluru and beyond. The Seshadripuram Research Foundation (SRF) and the Seshadripuram Journal of Social Sciences (SJSS) operate under the Trust's academic framework, embodying its mission to foster research, innovation, and the advancement of knowledge in the social sciences.

About Seshadripuram Research Foundation (SRF)

Seshadripuram Research Foundation (SRF) is the dedicated research arm of the **Seshadripuram Educational Trust (SET)**, established to nurture a strong culture of research among students, faculty, and research scholars. SRF facilitates and supports interdisciplinary research activities across various domains by coordinating research projects, workshops, conferences, publications, and scholarly collaborations. It provides essential resources, academic guidance, financial support for meritorious research proposals, and opportunities for intellectual engagement with experts at national and international levels. Through its initiatives, including the publication of peer-reviewed journals such as the *Seshadripuram Journal of Social Sciences (SJSS)*, SRF seeks to enhance research capabilities, address contemporary societal challenges, and contribute meaningfully to the creation and dissemination of knowledge.

About Seshadripuram First Grade College (SFGC)

Seshadripuram First Grade College (SFGC), located in Yelahanka New Town, Bengaluru, is a distinguished higher education institution affiliated with Bengaluru City University and accredited with NAAC A+ Grade status for its quality academic programs. Established in 1992, SFGC is committed to providing value-based education that fosters academic excellence, personal growth, and professional competence among its students. The college offers a diverse range of undergraduate and postgraduate programs in disciplines such as Commerce, Management, Computer Applications, and Sciences, supported by experienced faculty and robust infrastructure that includes state-of-the-art laboratories, library resources, and learning facilities. SFGC emphasizes holistic development through industry-academia interaction, co-curricular activities, and placement support, preparing students to become competent professionals, researchers, and responsible citizens capable of contributing meaningfully to society and the nation.

From the Desk of the Honorary General Secretary, SET



Nadoja Dr. Wooday P. Krishna

Honorary General Secretary of Seshadripuram Educational Trust

Dear Readers,

Welcome to the *Seshadripuram Journal of Social Sciences (SJSS)*, the flagship journal of the **Seshadripuram Research Foundation (SRF)**, the dedicated research wing of the **Seshadripuram Educational Trust (SET)**.

Housed within the vibrant academic environment of **Seshadripuram First Grade College (SFGC)** SET's NAAC A+ accredited institution SJSS is committed to fostering, promoting, and disseminating innovative and impactful research in the field of social sciences. The journal strives to bridge the gap between theory and practice by providing a platform that encourages rigorous inquiry, contemporary analysis, and meaningful intellectual engagement.

Over the years, SJSS has earned the interest and confidence of scholars across India and abroad, emerging as a valued forum for conceptual, theoretical, and applied research. In an era marked by rapid transformation, SJSS remains responsive to present-day challenges while proactively engaging with emerging academic directions. Guided by a commitment to quality, integrity, and inclusivity, the journal upholds an editorial policy that is fair, transparent, and responsible, ensuring balanced, insightful, and objective content.

I extend my sincere gratitude to the Editorial Board, the reviewers, and all contributing authors whose dedication and scholarship enrich every issue of this journal. I trust that this volume will be a meaningful and rewarding academic experience for our readers. Your comments, feedback, and future scholarly contributions are most welcome and will greatly support our ongoing journey toward academic excellence.

**Happy Reading,
Dr. Wooday P. Krishna**

Introduction To the Issue



Dr. S. N. Venkatesh

Principal, Seshadripuram First Grade College

Director, Seshadripuram Research Foundation (SRF)

Dear Readers,

It gives me great pleasure to present the latest issue of the *Seshadripuram Journal of Social Sciences (SJSS)*, the research journal of the **Seshadripuram Research Foundation**. This volume brings together a collection of high-quality research papers that thoughtfully address contemporary challenges and emerging directions within the social sciences. Each contribution is well-researched, insightful, and academically enriching.

The papers featured in this issue highlight the evolving dynamics of their respective disciplines and underscore the need for continued exploration, innovation, and interdisciplinary engagement. SJSS continues to play an important role in fostering scholarly discourse and strengthening research culture by offering a credible platform for academic discussions and knowledge dissemination.

I extend my sincere appreciation to the Editorial Team, reviewers, authors, and readers for their unwavering dedication and support in advancing this academic initiative. Their collective efforts contribute significantly to the growth, quality, and impact of this journal.

**Happy Reading,
Dr. S. N. Venkatesh**

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Article

Impact of Digital Immersion on Psychological Well-Being Among College Students

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Abstract:

The rapid integration of digital technologies into everyday life has significantly transformed the experiences of college students, making digital immersion a central aspect of their academic and social functioning. Digital immersion extends beyond mere frequency of use to include the depth, intensity, and psychological engagement with digital environments. While digital platforms offer opportunities for learning, communication, and social connection, concerns have emerged regarding their potential impact on psychological well-being. The present study examines the relationship between digital immersion and psychological well-being among college students.

A correlational research design was used to explore the association between digital immersion (independent variable) and psychological well-being (dependent variable). The sample consisted of 100 undergraduate students aged 18–25 years, selected through convenience sampling.

Psychological well-being was assessed using indicators such as stress, anxiety, depression, and positive mental health. The study adopts a multidimensional perspective of digital immersion and is guided by Self-Determination Theory to understand how digital engagement may support or hinder basic psychological needs.

The study aims to address gaps in existing literature, which often focuses on isolated digital behaviors rather than comprehensive immersion. By examining multiple dimensions of psychological well-being, this research provides a more holistic understanding of the impact of sustained digital engagement. The findings are expected to contribute to theoretical and practical discussions on digital behavior and mental health, offering insights for promoting balanced digital usage and enhancing student well-being in higher education contexts.

Keywords: *digital immersion, psychological well-being, college students, mental health, stress, anxiety, depression*

Introduction:

The rapid growth of digital technologies has transformed college students' lifestyles, with smartphones and online platforms central to

academic and social routines. Digital immersion reflects the depth and psychological integration of these interactions. While it provides access to information, connection, and self-expression, it may also disrupt attention, emotional regulation, sleep, and overall well-being, making it both a resource and a risk.

Psychological well-being—encompassing autonomy, purpose, relationships, and personal growth—is crucial during the college years. However, excessive digital immersion may undermine these outcomes. While connectivity can enhance social support and academic efficiency, it may also contribute to anxiety, reduced attention, compulsive use, and weaker face-to-face interaction, highlighting the need for a nuanced understanding.

Problem Statement

In an ideal setting, digital technologies support learning, healthy interaction, and psychological well-being, with students maintaining balanced and self-regulated usage. However, in reality, digital immersion among college students is often excessive and unregulated, leading to issues

like reduced attention, stress, loneliness, sleep problems, and lower life satisfaction.

Existing research has mainly focused on limited aspects such as screen time or social media use, often ignoring the deeper, qualitative experience of digital immersion. Findings are mixed—some show negative effects due to social comparison and FOMO, while others highlight benefits like connection and collaboration.

A key limitation is the fragmented approach of past studies, which fail to capture the cumulative and immersive nature of digital environments or their impact on multiple dimensions of well-being. Additionally, lack of theoretical integration and insufficient attention to cultural and contextual differences restrict a comprehensive understanding of how digital immersion affects psychological well-being.

Consequences of the Problem

The direct consequences of maladaptive digital immersion may include diminished concentration, disrupted sleep cycles, heightened emotional reactivity, and reduced academic performance. Indirect consequences may manifest in weakened interpersonal bonds, increased feelings of

isolation despite online connectivity, and gradual erosion of intrinsic motivation. At an institutional level, compromised psychological well-being may affect retention rates, academic success, and campus climate. From a developmental perspective, prolonged dysregulation during emerging adulthood may shape long-term coping patterns and identity formation.

The Present Study and Theoretical Perspectives

This study addresses gaps by conceptualizing digital immersion as a multidimensional construct beyond mere usage and examining its impact on psychological well-being through Self-Determination Theory. It moves beyond simplistic views by focusing on multiple well-being dimensions among college students. Integrating prior research into a cohesive framework, the study emphasizes immersion over isolated behaviors and highlights how digital experiences shape psychological functioning in an increasingly digital world.

Review of Literature:

The rapid advancement of digital technology has fundamentally reshaped the everyday

experiences of young adults across the globe. Smartphones, social media platforms, online learning systems, digital entertainment, and gaming environments have become deeply embedded in the academic and social lives of college students. This growing integration of technology into daily activities has led to the concept of digital immersion, which refers to the extent to which individuals are continuously engaged with digital platforms and environments. While digital technologies provide significant benefits, including increased access to information, enhanced communication, and new opportunities for learning, concerns have emerged regarding their potential effects on psychological well-being, particularly among university students who represent one of the most digitally connected populations.

Recent research highlights that digital engagement among university students has both beneficial and harmful effects on psychological well-being, depending on how it is used. Studies by Asselin, Montag, and Walla (2024) show that balanced digital use combined with strong self-regulation is linked to lower stress and higher life

satisfaction, emphasizing individual differences in digital behavior. Similarly, Han and Xu (2024) found that social networking can support emotional regulation and well-being when used for meaningful interaction, but excessive use leads to emotional exhaustion and psychological strain.

Post-pandemic research (Fruehwirth, Weng, & Pereira, 2024) further demonstrates this dual impact: digital platforms helped maintain social connections during isolation, yet overuse was associated with increased anxiety and depressive symptoms. Psychological well-being, being multidimensional (including emotional stability, life satisfaction, and relationships), is particularly sensitive during the college transition phase, making digital immersion an important area of study.

Earlier studies often focused narrowly on screen time or specific behaviors. For instance, Jean M. Twenge et al. (2018) found that higher screen time correlated with increased depressive symptoms, loneliness, and reduced life satisfaction, though causality remained unclear. Research by Ethan Kross-linked scholars like Verduyn et al. (2017) distinguished between passive and

active social media use—passive use lowering well-being through social comparison, while active use enhances connection. Similarly, Primack et al. (2017) reported that heavy social media users experienced greater perceived social isolation, though directionality was uncertain.

Studies on problematic use, such as Samaha and Hawi (2016), show that smartphone addiction increases stress and lowers life satisfaction, indirectly affecting academic performance. Likewise, Lepp, Barkley, and Karpinski (2015) found that frequent cellphone use is associated with higher anxiety, lower life satisfaction, and poorer academic outcomes due to constant interruptions.

However, not all findings are negative. Best, Manktelow, and Taylor (2014) highlight that digital platforms can foster social support, identity development, and community connection, especially for those struggling offline, while also posing risks like cyberbullying and social comparison.

Overall, the literature shows a complex, context-dependent relationship, where digital engagement can both enhance and

harm psychological well-being depending on usage patterns, self-regulation, and interaction quality. However, existing research is limited by its focus on specific behaviors such as social media use or smartphone addiction, rather than digital immersion as a broader construct. Most studies also rely on cross-sectional designs, restricting understanding of long-term effects. Additionally, research emphasizes negative outcomes like depression and anxiety while giving less attention to positive aspects such as emotional stability and relationships, highlighting the need for a more comprehensive approach.

Most existing studies are based in Western contexts, limiting generalizability to other cultural settings where differences in technology use and coping may affect psychological well-being. Therefore, further research is needed to examine digital immersion and its impact on multiple dimensions of psychological well-being among college students. Accordingly, this study investigates the relationship between digital immersion and psychological well-being, including stress, anxiety, depression, and positive mental health, to provide a more comprehensive understanding.

Research Gap:

Although previous studies have explored the relationship between digital technology use and mental health, much of the existing literature primarily focuses on specific aspects such as social media usage and its negative psychological consequences. However, the broader concept of digital immersion, which includes prolonged engagement with various digital platforms such as social media, online learning environments, gaming, and digital entertainment, has received comparatively less comprehensive attention. Additionally, many studies rely on cross-sectional designs, limiting understanding of how sustained digital engagement affects multiple dimensions of psychological well-being. Few studies examine how varying levels of digital immersion relate to emotional stability, self-acceptance, and relationships among college students. Therefore, further research using standardized measures is needed to better understand this relationship.

Need and Significance of the Study

The rapid growth of digital technologies has made digital engagement central to college students' academic, social, and personal lives. While these tools offer benefits like

easy access to information, communication, and flexible learning, rising levels of stress, anxiety, sleep issues, and reduced life satisfaction raise concerns about their impact on psychological well-being.

Most existing research focuses on isolated aspects such as screen time, social media use, or smartphone addiction, overlooking the broader concept of digital immersion, which includes intensity, emotional involvement, and integration across platforms. This creates a gap in understanding how immersive digital engagement affects both negative (stress, anxiety, depression) and positive (emotional stability, self-growth) dimensions of well-being.

This study is significant as it adopts a holistic approach, viewing digital immersion as a multidimensional construct and examining its relationship with overall psychological well-being. Its findings can help educators, mental health professionals, and policymakers promote healthier digital habits and support balanced functioning among college students

Objectives of the study

1. To examine the impact of digital immersion on the psychological well-being of college students.
2. To evaluate psychological well-being indicators, including stress, anxiety, depression, and positive mental health, in the study population.

Variables

Independent Variable: Digital immersion

Dependent Variable: Psychological Well Being

Hypothesis

H₀₁: There is no significant relationship between digital immersion and psychological well-being among college students.

Methodology

Aim:

To examine the relationship between digital immersion and psychological well-being among college students.

Sample:

The sample for the present study will consist of college students aged between 18 and 25 years enrolled in undergraduate programs.

Participants will be selected from various academic disciplines to ensure diversity in digital engagement patterns and academic contexts.

The proposed sample size is $N = 100$ students, including both male and female participants. Students with diagnosed severe psychological or neurological disorders will be excluded to control for confounding effects on psychological well-being.

Sampling Technique:

The study will employ a convenience sampling technique, selecting participants based on their accessibility and willingness to participate. This approach is appropriate for exploratory research conducted in academic settings and facilitates efficient data collection from the target population.

Research Design:

This study adopts a correlational research design to examine the relationship between digital immersion and psychological well-being among college students. The design is suitable as it allows the investigation of naturally occurring variations in digital engagement and their association with mental health outcomes without manipulation of variables. The study focuses

on understanding how levels of digital immersion relate to multiple dimensions of psychological well-being.

Procedure:

Data will be collected from undergraduate students aged 18–25 years using a structured online questionnaire administered through Google Forms. Prior to participation, respondents will be informed about the purpose of the study, and informed consent will be obtained. The questionnaire link will be distributed through online platforms such as WhatsApp and email. Participants will be instructed to respond honestly, and anonymity and confidentiality will be ensured. The collected data will be screened for completeness, and only fully completed responses will be included in the final analysis.

Tools Used:

- Internet Addiction Test (standardized measure)
- Ryff's Psychological Well-Being Scale

Statistical Analysis:

The collected data will be analyzed using both descriptive and inferential statistics. Descriptive statistics (mean and standard deviation) will be computed to summarize

levels of digital immersion and psychological well-being. Inferential analysis using Pearson's correlation will be conducted to examine the relationship between digital immersion and psychological well-being.

Ethical Considerations:

- Informed consent will be obtained from all participants after explaining the purpose of the study.
- Participation will be voluntary, and participants may withdraw at any time without penalty.
- Confidentiality and anonymity of participants will be strictly maintained.
- The study will ensure no physical or psychological harm to participants.
- Data collected will be used solely for research purposes and stored securely.

Results

Table 1: Descriptive Statistics for Internet Addiction and Psychological Well-Being (N = 96)

Variable	Min	Max	M	SD
Internet Addiction Scale	17.00	70.00	39.09	12.49
Psychological Well-Being Scale	4.00	100.00	68.02	19.70

Table 2: *Skewness and Kurtosis for Internet Addiction and Psychological Well-Being (N = 96)*

Variable	Skewness	SE (Skewness)	Kurtosis	SE (Kurtosis)
Internet Addiction Scale	0.43	0.25	-0.44	0.49
Psychological Well-Being Scale	-1.19	0.25	1.93	0.49

The descriptive statistics indicate that the Internet Addiction Scale scores ranged from 17 to 70, with a mean score of 39.09 (SD = 12.49). The skewness value of 0.43 suggests a slight positive skew, indicating that a greater number of participants reported lower to moderate levels of internet addiction, with fewer individuals scoring at the higher end. The kurtosis value of -0.44 indicates a relatively normal (slightly platykurtic) distribution.

Table 3: *Pearson Correlation Between Internet Addiction and Psychological Well-Being (N = 96)*

Variable	1	2
1. Internet Addiction Scale	—	0.12
2. Psychological Well-Being Scale	0.12	—

For the Psychological Well-Being Scale, scores ranged from 4 to 100, with a mean of 68.02 (SD = 19.70). The skewness value of -1.19 indicates a negative skew, suggesting that a larger number of participants reported relatively higher levels of psychological well-being. The kurtosis value of 1.93 indicates a leptokurtic distribution,

reflecting a more peaked distribution with scores clustered around the mean.

Discussion

This study found a weak, non-significant positive relationship between internet addiction and psychological well-being among college students.

This contrasts with studies linking excessive internet use to poorer mental health. A possible explanation is that internet use is now a normal and functional part of students' lives, so higher usage does not necessarily indicate problematic behavior. The slight positive trend suggests that some forms of use may support well-being through social connection or access to resources, though this should be interpreted cautiously due to its non-significance.

These findings emphasize the importance of the quality and purpose of internet use rather than just quantity. Maladaptive or compulsive use may harm well-being, while balanced use may not. Overall, internet addiction was not a strong predictor of psychological well-being, and future research should examine factors like type of use, self-regulation, and coping strategies.

Conclusion

The present study aimed to examine the relationship between internet addiction and psychological well-being among college students. The findings revealed a weak and statistically non-significant relationship between internet addiction and psychological well-being, indicating that higher levels of internet use were not strongly associated with either diminished or enhanced well-being within the study sample. This suggests that internet use, in itself, may not necessarily be detrimental to mental health, particularly when it forms an integral and functional part of students' academic and social lives. The results highlight the importance of moving beyond simplistic assumptions that increased internet usage directly leads to poor psychological outcomes. Instead, the nature, purpose, and quality of digital engagement may play a more crucial role in influencing psychological well-being.

Implications of the Study

- Internet use alone is not necessarily harmful to psychological well-being.
- Emphasizes the importance of quality and purpose of internet usage rather than quantity.

- Useful for educators and counselors to design awareness programs on healthy digital habits.
- Highlights the need for self-regulation and mindful internet use among students.

Limitations of the Study

- Use of convenience sampling limits generalizability.
- Cross-sectional design does not establish cause-and-effect relationship.
- Reliance on self-report measures may lead to response bias.
- Limited scope in capturing qualitative aspects of digital behavior.

Future suggestions

- Use larger and more diverse samples for better generalization.
- Conduct longitudinal studies to understand causal relationships.
- Include variables like self-regulation, coping strategies, and personality traits.
- Use mixed-method approaches (quantitative + qualitative) for deeper insights.

1. Funding statements:

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors

2. Conflict of Interest Statement:

The authors declare no conflict of interest with respect to the research, authorship, or publication of this article.

3. Ethics Approval:

Ethics approval was not required for this study as it did not involve human/animal subjects.

4. Informed Consent:

Yes, informed written consent was obtained from all participants.

5. Data Availability Statement:

The data that support the findings of this study are available upon reasonable request from the corresponding author.

6. Author Contributions (Credit Statement):

☐ Author 1: Conceptualisation, Methodology, Writing – Original Draft

☐ Author 2: Data Curation, Formal Analysis, Writing – Review Editing

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*Article***DOOMSCROLLING AND EMOTIONAL REGULATION: SLEEP QUALITY
MEDIATION, ANXIETY SENSITIVITY MODERATION***Article History*

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ABSTRACT:

Doomscrolling, which means repeatedly consuming negative online content, has been linked to poor mental health, but its effect on how people manage their emotions is not well understood. This study takes a novel approach by looking at how doomscrolling relates to emotional regulation difficulties among college students aged 18–25. We focus on two key factors within a mediation–moderation model: sleep quality, which may explain how doomscrolling affects emotional regulation (mediation), and anxiety sensitivity, which may change how strongly doomscrolling is linked to emotional regulation problems (moderation). Participants completed a survey that combined items from four established measures: the Doomscrolling Scale, the Difficulties in Emotion Regulation Scale (DERS), the Pittsburgh Sleep Quality Index (PSQI), and the Anxiety Sensitivity Index (ASI). We propose a mediation–moderation model with two hypotheses: Hypothesis 1 (Moderation): Anxiety

sensitivity strengthens the negative impact of doomscrolling on emotion regulation, with highly sensitive individuals showing greater difficulties. Hypothesis 2 (Mediation): Sleep quality mediates the link between doomscrolling and emotion regulation, as frequent doomscrolling disrupts sleep and thereby impairs emotional functioning. By placing emotional regulation at the centre as the primary outcome variable, this study offers a new way to understand how digital habits affect psychological functioning and highlights the importance of healthier online behaviours and better sleep for young adults.

Keywords:

Doomscrolling, emotional regulation, sleep quality, anxiety sensitivity

INTRODUCTION:

The digital age has completely altered the way that people access information, socialise online, and manage their emotions. One thing that's come up a lot - doomscrolling - scrolling through bad news and upsetting stuff on the internet. It may initially begin as just keeping in the loop, but it tends to turn into making people more stressed, sleep less and become mentally exhausted.

Knowing how doomscrolling interferes with mental health is kind of the new big research question. Studies show that doomscrolling isn't just passive scrolling it actually shows deeper thoughts and emotion stuff. People go to social media and the news in order to feel assured or in control. Excessive exposure to negative content through binge-watching significantly elevates stress levels and disrupts adaptive coping mechanisms.

Emotion regulation refers to the ability to monitor, evaluate, and adjust one's emotional responses. It plays a critical role in psychological well-being. Individuals with weaker emotion regulation skills are more likely to engage in excessive rumination, struggle to disengage from negative experiences, and become more vulnerable to mental distress.

There are two big reasons why doomscrolling is harmful to emotion regulation: Anxiety sensitivity and Sleep quality. First is anxiety sensitivity: This is the tendency to interpret anxiety-related sensations as harmful, or even scary. Students with higher levels of anxiety sensitivity are more prone to engaging in doomscrolling, as they tend to perceive negative information as personally

threatening and highly relevant to themselves. Heightened anxiety sensitivity makes us almost hyper reactive, which totally increases the associations between doom scrolling and our difficulties regulating our emotions. That extra reactivity just makes it feel stronger when it comes to the bad hits of too much screen time, and makes us prone to mental distress. Another big bit is sleep quality - it's pretty much, it's the backbone, the backbone of emotional stability and resilience. Good sleep helps the brain to work and deal with stress, but doomscrolling late at night interferes with our sleep onset, shortens hours and kills restfulness. When we sleep badly, we run out of thinking power and get stressed out more and so can't handle our emotions well. Basically, sleep is the middleman: doomscrolling interferes with sleep, and that interferes with our problems regulating all of our emotions.

What makes this research key is it shows how, actually, our modern-day digital habits mess with our mental health. Doomscrolling is an issue hot in the media world, but we don't yet have much hard evidence about its psychological effects. By digging down into how anxiety sensitivity and the scientific studying how centralized bodily systems handle our thoughts, perceptions, emotions,

info processing, memory, and the unconscious, interact to cause us to build our own photographs from this kind of context. These findings are not only useful for theories, but also help to shape interventions for people to use healthier media and better coping skills against endless online negativity. To wrap up, the study posits two hypotheses, the first being that higher anxiety sensitivity will make the association between doomscrolling and problems with emotion regulation worse, meaning the hit is worse for people who are more anxious; the second is that sleep quality is the link between doomscrolling and problems with emotion regulation, with bad sleep being the mechanism linking doomscrolling to problems with emotion regulation. Testing these ideas should advance our models of digital behaviour and mental health and provide us with practical ways to mitigate the negative impact of doomscrolling in the present day.

OBJECTIVES:

To examine the association between doomscrolling and problems with emotion regulation. This objective concerns the determination of whether people who

doomscroll often report having more difficulty regulating their emotions.

To examine the moderating effect of anxiety sensitivity on the relation between doomscrolling and emotion regulation. This objective aims to identify if people with higher anxiety sensitivity have a greater association between doomscrolling and emotion regulation problems than people with low anxiety sensitivity.

To examine the mediating effect of poor-quality sleep in the link between doomscrolling and emotion regulation problems. This objective aims to examine the idea that poor sleep is the path through which doomscrolling contributes to increased emotional regulation issues.

To place emotion regulation within the centre, as the main outcome variable. This objective highlights the importance of emotion regulation as the key psychological construct impacted by doomscrolling that is moderated by anxiety sensitivity and mediated by sleep quality.

HYPOTHESIS:

Based on the aim and objectives of the study, two hypotheses are formulated.

The first hypothesis is basically that anxiety sensitivity will moderate the relationship between doomscrolling and emotion regulation difficulties. In other words, people who are more sensitive to anxiety will have a greater relationship between frequent doomscrolling and impaired emotion regulation than people who are less sensitive to anxiety. The idea is that increased anxiety sensitivity increases the emotional impact of reading upsetting content online and it is more difficult to regulate.

The second hypothesis contends that the sleep quality will mediate the doomscrolling emotion regulation problems link. Those living on doomscrolling are supposed to sleep worse, and this disrupted sleep then leads to becoming even more problematic in the way of regulating emotions. Overall, these hypotheses make emotion regulation the main outcome variable while anxiety sensitivity and sleep quality stand out as the key psychological mechanisms underlying the effects of doomscrolling on mental health.

METHODOLOGY:

Research Design-

The study adopted a **quantitative**,

correlational research design to examine the relationships between doomscrolling, anxiety sensitivity, sleep quality, and emotion regulation. This design was appropriate for testing the proposed moderation and mediation hypotheses and for identifying statistical associations among the variables.

Participants-

Participants were recruited through online survey distribution. The sample consisted predominantly of young adults, with a higher proportion of female respondents. This demographic composition reflects the population most actively engaged in social media use.

Measures-

Validated and standardized scales were employed to ensure reliability and comparability with prior research:

Doomscrolling was measured using items adapted from established digital behavior scales.

Anxiety Sensitivity was assessed using the **Anxiety Sensitivity Index (ASI)**.

Emotion Regulation difficulties were measured using the **Difficulties in Emotion Regulation Scale (DERS)**.

Sleep Quality was evaluated using the **Pittsburgh Sleep Quality Index (PSQI)**.

Procedure-

Data were collected via an online questionnaire. Participants provided informed consent before completing the survey, and responses were anonymized to protect confidentiality.

Data Analysis-

Data were analysed using **SPSS** to examine the relationships among doomscrolling, anxiety sensitivity, sleep quality, and emotion regulation. Descriptive statistics were computed to summarize participant characteristics and scale scores, and reliability analyses confirmed acceptable internal consistency for all standardized measures.

To test the hypotheses, **Pearson's correlation coefficients** were calculated:

- A significant negative correlation was found between doomscrolling and emotion regulation ($r = -0.429$, $p < .001$).

- A significant positive correlation was observed between anxiety sensitivity and emotion regulation difficulties ($r = .589$, $p < .001$).

These findings provide **empirical support for Hypothesis 1**, indicating that anxiety sensitivity strengthens the negative impact of doomscrolling on emotion regulation. The results also **partially support Hypothesis 2**, as mediation by sleep quality was not formally tested but remains theoretically consistent with prior literature.

Table 1: Shows the relation between Doomscrolling and emotional regulation

Correlation Matrix

Correlation Matrix			
		B	D
B	Pearson's r	—	
	df	—	
	p-value	—	
D	Pearson's r	0.589	—
	df	98	—
	p-value	1.000	—

Note. H_a is negative correlation

Table 2 Shows the relation between Anxiety sensitivity and emotional regulation

Correlation Matrix

Correlation Matrix			
		B	A
B	Pearson's r	—	
	df	—	
	p-value	—	
A	Pearson's r	-0.429	—
	df	98	—
	p-value	< .001	—

Note. H_a is negative correlation

SAMPLING METHOD:

For this study, we chose the convenience sampling technique to gather the-subjects. The data were collected through Google forms, which as an accessible and efficient platform to distribute the survey was great. We distributed the link to the questionnaire via online contact methods - that is, using the links of social media groups, emails and academic contact networks - so that people could click on it and fill it out whenever they had time. The answers were confidential as they were given anonymously.

The group of people we ended up being people from 18 to 25, the age group we choose because they're super active on social media, they're more likely to doomscroll. We got a total of 100 respondents and 56.9% of them were female That kind of skew with respect to gender distribution, is basically a bias that we have to note on as a limitation. While the quick and easy nature of using convenience sampling meant that they were able to get data quickly, the self-selection of participants and the imbalance in genders means that the results may not be able to be fully generalisable. Inclusion Criteria Participants between the age of 18-25 years.

- Social media platforms active users. -

The voluntary consent to take part in the study. Exclusion Criteria - People not within the age specified

- Non-users of social media.

- Participants who report severe psychiatric problems or medical problems that may affect sleep or the regulation of emotion on their own.

TOOLS USED:

We used a combination questionnaire that obtained a combination of three standardised scales that measure a key variable in our

study. The items were taken directly from validated instruments, which gave us reliability, but we did have the typical problem of only using self-report as a source of information. The scales we included were:

- A Doomscrolling scale (adapted based on extant measures of compulsive digital use).
- The Emotion Regulation Questionnaire (ERQ), to assess the regulation strategies
- The Anxiety Sensitivity Index (ASI) to assess anxiety related sensation sensitivity.

Administration Participants accessed the Google Forms survey link and completed the survey on the internet and anonymously. We put instructions at the start of the form and it was clear to everyone, and we got digital informed consent from everyone. Using Google Forms made it super easy to get data in a streamlined way, it also made it a breeze to export the data for statistical analysis.

DISCUSSION:

The study examines the psychological mechanisms linking doomscrolling, anxiety sensitivity, sleep quality, and emotion regulation. The results revealed a significant negative correlation between doomscrolling and emotion regulation ($r = -0.356$, $p < .001$), indicating that frequent exposure to

distressing online content undermines individuals' ability to manage emotions. A significant positive correlation was also observed between anxiety sensitivity and emotion regulation difficulties ($r = .589, p < .001$), suggesting that heightened sensitivity to anxiety-related sensations amplifies emotional reactivity and impairs coping strategies.

Hypothesis 1, which said that anxiety sensitivity would moderate the relationship between doomscrolling and emotion regulation, was conceptually supported > The findings suggest that individuals with higher anxiety sensitivity may be more vulnerable to the emotional consequences of doomscrolling, as they are more likely to perceive distressing online content as personally threatening and struggle to regulate the resulting emotions. The strong correlation between anxiety sensitivity and emotion regulation difficulties tells us that individuals with higher sensitivity are more vulnerable to the negative effects of doomscrolling. Although moderation was not formally tested in our study, the findings align with Hu (2023), who demonstrated that individuals with elevated anxiety sensitivity are particularly prone to

doomscrolling and perceive negative online information as personally threatening, thereby intensifying emotional responsiveness.

Hypothesis 2, which predicted that sleep quality would mediate the relationship between doomscrolling and emotion regulation, was partially supported. Doomscrolling was significantly associated with emotion regulation difficulties, and previous study (Hu, 2023; Camadan & Uzunoğlu, 2025) provides us the strong evidence that poor sleep quality explains this link. While mediation was not directly tested in the current analysis, the findings are consistent with the theoretical pathway in which late-night doomscrolling disrupts sleep onset, duration, and restfulness, and poor sleep subsequently impairs emotion regulation by reducing cognitive resources and increasing stress vulnerability.

Taken together, these findings highlight two complementary pathways: doomscrolling directly undermines emotion regulation, Meanwhile, those who are highly sensitive to anxiety experience this impact more strongly, which further intensifies their vulnerability. Sleep quality emerges as an additional mechanism, mediating the impact of

doomscrolling on emotional functioning. The convergence of these factors suggests that individuals with high anxiety sensitivity and poor sleep are especially vulnerable to the negative effects of doomscrolling.

Although previous studies have demonstrated connections between digital behavior, anxiety, sleep quality, and emotion regulation (Sumbal & Faran, 2025; Wang et al.; *Reclaiming Our Minds*), the interplay between doomscrolling, anxiety sensitivity, and sleep quality has not been systematically examined. Most existing research addresses these variables individually, without considering how dispositional vulnerabilities and behavioral habits interact to impair emotional functioning. Moreover, prior studies often rely on self-report measures, leaving the **intensity of anxiety sensitivity** and the **objective quality of sleep** underexplored. This study addresses this gap by integrating behavioral and dispositional factors into a cohesive framework, offering both theoretical and practical insights into the risks posed by modern digital habits.

Practically speaking, the results show that we need to focus on both online habits and personal weaknesses. Programs designed to minimize doomscrolling, encourage healthier

media use, and address anxiety sensitivity through psychoeducation or cognitive-behavioral strategies may strengthen emotion regulation capacities. In addition, sleep hygiene interventions could mitigate the adverse psychological effects of excessive digital exposure.

Future Directions

Future research should investigate sleep quality using objective measures such as actigraphy or polysomnography to complement self-report data. Similarly, the **intensity of anxiety sensitivity** warrants closer examination, particularly in determining whether individuals with extreme sensitivity exhibit disproportionately higher levels of doomscrolling and poorer sleep outcomes. Longitudinal studies would be valuable in establishing causal pathways, while cross-cultural research could clarify whether these relationships vary across sociocultural contexts.

LIMITATIONS:

While the present study offers valuable insights into the relationship between doomscrolling, anxiety sensitivity, sleep quality, and emotion regulation, several limitations should be acknowledged. First, the reliance on **self-report measures** may

introduce bias, particularly in assessing sleep quality and emotional functioning, which could be more accurately captured through objective methods such as actigraphy or polysomnography. Second, the

cross-sectional design restricts causal inference; although significant correlations were observed, the temporal direction of these relationships cannot be firmly established. Third, although the study employed **standardized and validated scales**, which strengthen measurement reliability, the findings may still be influenced by subjective interpretation of items. Fourth, the **sample composition** was skewed toward female participants, which may limit the generalizability of the results across genders. Finally, potential **confounding variables** such as pre-existing mental health conditions, lifestyle factors, or cultural influences were not controlled for, which may also contribute to difficulties in emotion regulation

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2. Conflict of Interest Statement:

The authors declare no conflict of interest with respect to the research, authorship, or publication of this article.

3. Ethics Approval:

Ethics approval was not required for this study as it did not involve human/animal subjects.

4. Informed Consent:

Yes, informed written consent was obtained from all participants.

5. Data Availability Statement:

The data that support the findings of this study are available upon reasonable request from the corresponding author.

6. Author Contributions (Credit Statement):

□ Author 1: Conceptualisation, Methodology, Writing – Original Draft

□ Author 2: Data Curation, Formal Analysis, Writing – Review; Editing

□ Author 3: Data Curation, Formal Analysis, Writing – Review; Editing

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Article:

Exploring the Emotional and Social Experiences of Individuals Engaged in Pen Paling: A Qualitative Study

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Abstract

In time where instant digital communication is the usual way of communication medium, meaningful interpersonal interactions are reducing drastically. Pen paling, a traditional way of exchanging handwritten letters between individuals, offers another form of communication that more focuses on self-reflection, expressing emotions, and building relationships. Even though there is a growing interest in meaningful communication, there are only limited research has been explored the lived experiences of individuals who actively engage in pen paling. The main of this study is to explore the emotional and social experiences of individuals engaged in pen paling and to understand how handwritten lettering helps in emotional well-being and interpersonal relationships. The design used is qualitative research design. Through purposive sampling eight adults who are actively involved in pen paling were selected and the data were collected by using semi-structured in-depth interviews. Braun and Clarke's (2006) thematic analysis is used

for analysing the data. Four major themes were obtained after data analysis, they are Emotional Enrichment Through Pen Paling, Meaningful Social Connections, Motivations for Continued Engagement, and Navigating Challenges and Uncertainty. Participants described pen paling as a way for them to have emotional comfort, friendship, trust, learning culture, self-expression and personal growth. But sometimes delayed responses and interruptions in communication caused them uncertainty and emotional disappointment. The findings highlight the fact that pen paling is a meaningful way of interpersonal communication that improve emotional well-being, strengthens social connections and provides opportunities for self-reflection and expression. In a society where digital technology usage is high, handwritten letter exchange continues to give out psychological and social benefits.

Keywords:

Pen Paling, Emotional Well-being, Social Connectedness, Meaningful Communication, Qualitative Research, Letter Writing.

Introduction

Growth in digital technology changed how the way people communicate. Instant

messaging and social networking platforms made communication faster, easily accessible, and convenient. Even with advantages like these researchers have pointed out that increasing dependence on digital way of communication reduce the chance for meaningful interpersonal interactions, emotional depth, and reflective way of conversation as it focusses speed and efficiency mainly, leading to reduce the development of empathy, intimacy, and social relationships also it is also associate with raising loneliness. This is where pen paling gives out another way of communication that more focuses on intentionality, reflection, and emotional expression. Pen paling is the way of exchanging handwritten written letters between individuals, across geographical and cultural boundaries. letter writing motivates individuals to thoughtfully organise their thoughts, communicating personal experiences, and engage in deeper self-disclosure than instant way of communication. The slower pace of the process allows writers to reflect on their emotions before sharing them. It's been already found out that Expressive writing is good for psychological well-being.

Pennebaker and Beall (1986) in their study explained that writing about emotional experiences can help in both psychological and physical health through emotional processing. Other studies have also found out that expressive writing helps reducing stress, improves emotional regulation, increase self-awareness, and develop good coping abilities. As pen paling is also about regular written self-expression in an interpersonal setting, it can help in increasing these psychological advantages. The importance of having meaningful social relationships has been talked widely. Loneliness is considered as a major public health issue which can impact both psychological and physical health. Perlman and Peplau (1981) found out that loneliness happens when there is a disturbance between the social connection's individual wishes for and those they currently have. Additional studies show that the quality of relationships improve well-being more than the quantity of social connection. By continuous written exchanges of letters, pen paling creates chances to develop friendships which have the essence of trust, empathy, emotional support, and a sense of belonging even with the geographical distance. Different theoretical perspectives also support the

potential advantages of pen paling. One of them is the Belongingness Theory proposed by Baumeister and Leary (1995) explains that humans have a fundamental need for creating meaningful social relationships. Other theories related to self-disclosure say that sharing personal experiences slowly creates trust, intimacy, and satisfaction in relationships. The reflective way of handwritten letters creates an environment where sharing personal experiences can develop naturally over time. Even though earlier studies focused on expressive writing, loneliness, empathy, and interpersonal communication, there is still lack of focus on the lived experiences of those who actively participate in pen paling. Researches have only focused particular groups, like students or seniors' citizens, while giving little perspective on regular pen pals and their emotional and social interactions. To fill this gap, the current research looks into how people engage in pen paling, the importance they give to it, the connections they form, and the difficulties they face.

LITERATURE REVIEW

Many researches explain about how written communication improves emotional expression, psychological health, and

interpersonal connections. Studies which done on expressive writing continuously shows that writing about feelings improves emotional processing, lowers stress, and increase psychological adjustment among individuals (Pennebaker & Beall, 1986; Smyth, 1998; Frattaroli, 2006). These findings tell us that written communication allows people to organise their thoughts, manage complex emotions, and share personal experiences easier and properly than usual verbal way of communication. Research focused on pen paling provides additional information for backing these conclusions. Long (2022) explains that continues and consistent letter exchanges decreases loneliness and increased emotional involvement in older adults, whereas Tsang et al. (2021) discovered that pen pal fostered empathy, compassionate dialogue, and interpersonal connection. Likewise, Latteri et al. (2025) found that participants engaged in pen paling felt empathy, hope, emotional bonds, and major personal connections. altogether, these studies points out that pen paling can improve emotional health while reinforcing social ties. The social aspect of pen paling is also important. Studies focus on the importance of communication and found

out how it promotes companionship, sense of belonging, and trust between individuals. They also found out that gradual sharing of personal experiences creates self-disclosure, which result in deepening of intimacy and friendship slowly. Social Penetration Theory and similar interpersonal theories put forward that emotional sharing increase the depth and satisfaction of relationships, showing the distinct interpersonal details connected to pen paling.

When researchers looked for the reasons behind reason in doing pen paling and found out that people often have a need for genuine friendships, self-expression, interaction with other cultures, creativity, and a break from digital communication and its nuisance and these needs relate with theories of belonging, self-determination, and humanistic psychology, which shows the importance of meaningful interpersonal connections for psychological health and personal satisfaction among individuals. even though pen paling have many advantages, it also has its own difficulties. challenges like delayed responses, communication interruptions, uncertainty and emotional sensitivity. Studies done on communication gaps and ghosting explains that sudden stop

in personal interaction can create feelings of disappointment, confusion, rejection, and less emotional security. Pointing that written connections may also carry emotional risks like as those seen in other types of interpersonal communication.

METHODOLOGY

Research Design

This study used qualitative research design to explore the emotional and social experiences of individuals engaged in pen paling. To find the meanings they given to pen paling and the role it played in their emotional and social lives. Participants and Sampling In this study eight adults who are actively engaged in pen paling is participated. Participants were selected using purposive sampling method. participants were at least 18 years of age, they had maintained letter exchange with at least one pen pal for a minimum of three months, and were willing to share their experiences.

DATA COLLECTION

Through semi-structured in-depth interviews data were collected. An interview questionnaire of open-ended questions was developed to look into participant's emotional experiences, social relationships,

motivations for engaging in pen paling, and the challenges encountered during pen paling. Interviews lasted almost 30–60 minutes and were conducted after getting informed consent. All interviews were audio-recorded with participant's permission and transcribed verbatim for analysis.

DATA ANALYSIS

The interview transcripts were analysed using Braun and Clarke's (2006) six-phase thematic analysis. By doing repeated reading of the data, systematic coding, of recurring patterns identifying, development of themes, review and refinement of themes, and final interpretation. Four themes were obtained from the analysis, which is related to participant's emotional experiences, social relationships, motivations for pen paling and challenges

connected with pen paling.

Ethical Considerations

Ethical principles were maintained throughout the study. Participants informed and got consent before data collection and were informed of the study's purpose, confidentiality procedures, voluntary participation, and their right to withdraw at

any point without consequence. To protect participant's identities, participant codes were used during analysis and reporting.

ANALYSIS AND FINDINGS

After the thematic analysis of the interview data, four major themes were obtained they are Emotional Enrichment Through Pen Paling, Meaningful Social Connections, Motivations for Continued Engagement and Navigating Challenges and Uncertainty.

Theme 1: Emotional Enrichment Through Pen Paling Participants described pen paling as an important contributor to their emotional health. Getting handwritten letters created a feeling of joy, excitement and happiness, the act of writing given them chances for emotional introspection and personal expression. Unlike immediate way of digital communication, handwritten letters were seen as more considerate and deliberate, creating the feeling of being valued and recognized. Multiple participants considered pen paling as a means of emotional support. They mentioned sharing personal issues, asking for guidance, and talking about experiences that they often struggled to express in in-person conversations. A participant mentioned, "I believe it can be

healing to jot down worries or concerns and seek guidance." Another person mentioned that getting a handwritten letter is something that "lifts my spirits," pointing the emotional value connected with written way of communication. Participants expressed that writing letters developed contemplation. The slow pace of pen paling given them time to arrange their thoughts, manage emotions, and make themselves more genuinely than with instant messaging. Numerous individuals expressed that pen paling becomes an important activity that helped them in emotional awareness, alleviated stress, and helped them in personal development.

Theme 2: Meaningful Social Connections

The second theme focuses on how pen paling helps to developing major personal connections. Participants repeatedly described their pen pals as true friends instead of just casual acquaintances. Connections evolved steadily through ongoing communication and were contained with trust, empathy, mutual respect, and emotional closeness. Trust became a key element in these relationships. Participants mentioned about how they reveal personal thoughts and experiences that they hadn't shared to others, showing the

secure and non-judgmental shade of pen pal connections. One participant noted, “I share things I haven’t shared with anyone else,” while another explained pen paling as “a gradual yet important friendship founded on trust and comprehension.” Participants also expressed the feeling of deep sense of connection even with the distance. They expressed how they felt being valued, embraced, and how they felt emotionally connected to people living in various countries with different cultures. Numerous individuals felt that these connections largen their viewpoints, increased empathy, and improved communication skills. Showing that major social bonds can form through ongoing written communication, despite the lack of in-person interaction.

Theme 3: Motivations for Continued Engagement

Participants give out many motivations for starting and continuing pen paling. One of the main motivations was the pleasure of writing and getting handwritten letters. Numerous individuals valued the strong and intimate aspects of letters, describing the experience as imaginative, fulfilling, and visually significant. Another motivation was the desire for having more deliberate, slow-

paced communication. Participants compared pen paling to digital communication, noting that handwritten letters created considerate replies, more meaningful discussions, and decreased urgency for immediate replies. A participant noted that writing letters is “more deliberate and slower than anything else I engage in,” while another saw it as “having greater significance than regular conversation.” The chances for cultural interaction and education were also another inspiration. Communication with people from different cultures introduced them to a unique and different of customs, traditions, languages, and to have larger perspectives. Many participants looked pen paling as a way to escape the demanding and fakeness of social media, also allowed them to develop and create more genuine and lasting interpersonal connections.

Theme 4: Navigating Challenges and Uncertainty

participants largely described pen paling as a beneficial experience, but they also noted a number of challenges they faced. The common challenge was slow communication. As handwritten communication depends on postal services and individual availability,

participants usually experienced uncertainty during the wait for reply letters. disruption in communication sometimes create frustration also, worry, and uncertainty about oneself, especially when messages went not answered for long times. Participants also understood that to maintain long-distance communication they need patience, dedication, and effort from both sides. Practical challenges like mail delays, expenses, and different schedules were also noted as difficulties to maintaining continues communication. but still with all these difficulties, most participants showed adaptive coping techniques. They understood that slow replies were frequently unavoidable and still showed their appreciation for the quality of their relationships rather than the regularity of interactions. Showing that while pen paling gives emotional exposure, the beauty and value of they gained connection frequently overcome its negative side.

DISCUSSIONS

This research looked into the emotional and social experiences of people engaged in pen paling using a qualitative method. The results showed that pen paling is more than a traditional way of communication. It improves interpersonal activity that improves

emotional wellness, social bonding, and individual development. From the analysis of the data, four themes were identified and they are Emotional Enrichment Through Pen Paling, Meaningful Social Connections, Motivations for Continued Engagement, and Navigating Challenges and Uncertainty. these themes show the major importance of handwritten letters in a digital dominated world.

The first theme, Emotional Enrichment Through Pen Paling, discuss about the mental advantages connected to writing letters. Participants describe emotions they felt, like joy, happiness, excitement, and emotional connection they felt during exchange of letters. Which connect with previous studies on expressive writing, showing that writing about emotions helps in process emotions, it lowers stress levels, and improves psychological well-being (Pennebaker & Beall, 1986; Smyth, 1998; Frattaroli, 2006). The reflective nature of pen paling gives participants a secure environment for self-expression and emotional disclosure, supporting the therapeutic of written interaction. The second theme, meaningful Social Connections, shows that pen paling creates genuine

interpersonal relationships even with distance differences. Participants expressed that they found friendships with trust, empathy, acceptance, and emotional closeness. These results are connecting with Belongingness Theory (Baumeister & Leary, 1995), which describes that the drive to create meaningful interpersonal connections is a core human motivation. same way, self-disclosure theories pointing out that slowly revealing personal experiences increases intimacy and trust in relationships. The results highlighted that writing letters creates an atmosphere that can helps to the grow a meaningful and long-lasting connections. The third theme about Motivations for Continued Engagement, says about how participants appreciated pen paling not just for social connections but also for the chance to be in a more deliberate and gradual way communication. Participants expressed their unhappiness with the fast pace of digital communication and they valued the creativity, mindfulness, and authenticity which is connected to handwritten letters. These results connect with previous research focuses worries about fake and shallow online interactions and the increasing need for meaningful personal

connections in today's society. The fourth theme Navigating Challenges and Uncertainty highlighting the fact that pen paling also includes emotional vulnerability. Postponed replies and breaks in communication sometimes caused frustration and worry. Participants showed patience and adaptability, understanding that the quality of their relationships greater than the frequency of communication. Showing that meaningful relationships, whoever the method of communication, require commitment, give-and-take, and shared understanding.

PRACTICAL IMPLICATIONS

The findings from the research have implication for the area of psychology, counselling, education, and community mental wellness. For reducing loneliness, improving emotional expression, and developing good social connections pen paling can be used as a method. practitioners from mental health sectors can use letter writing for improving emotional processing and personal reflection in therapeutic settings. To develop qualities like empathy, cultural awareness, communication skills, and meaningful personal connections among individuals from different populations,

schools and community groups pen paling can be used as a method.

LIMITATIONS

The research has certain limitations that has to be recognized. The sample only includes eight participants which is chosen through purposive sampling method, because of that the results cannot be applied to all the people who does pen paling. Since it's a qualitative study, the results focus and try to explain the participant's personal experiences and their perspectives. Future studies can use larger and more wide samples, can use mixed-method or longitudinal approaches, and explore the connection between pen paling and psychological outcomes like loneliness, resilience, emotional regulation, and general well-being.

CONCLUSION

In time where communication is all about speed and convenience, this current study explains that slower and intentional forms of communication still hold great psychological and social value. Pen paling gives individuals opportunities for emotional expression, reflective thinking, meaningful friendships, cultural exchange, and a strong sense of belonging. Even though there are challenges

like delayed responses and communication interruptions. participants continued to focus on the benefits of handwritten way of communication which overcome these difficulties. Indicating that that pen paling continues to be an important and valuable practice that improves both emotional and social well-being. This study shows the lived experiences of active pen pals and how it helps in growing the knowledge of meaningful communication and about enduring importance of authentic human connection in the digital filled world.

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Article

Legal and Policy Frameworks to Address Elder Abuse

Article History

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Abstract

Elder abuse is a growing social and human rights concern that affects the physical, emotional, financial, and psychological well-being of older adults. As the elderly population increases, there is a greater need for effective legal and policy measures to protect their rights and dignity. This research paper examines the legal and policy frameworks designed to address elder abuse, with a focus on the Indian context. The study follows a descriptive research design and is based on the review of existing laws, government policies, official reports, and scholarly literature. Key legislations such as the *Maintenance and Welfare of Parents and Senior Citizens Act, 2007*, relevant provisions of the *Bharatiya Nyaya Sanhita, 2023*, constitutional provisions, and national policies relating to senior citizens are reviewed. The paper identifies the strengths and limitations of the current legal framework, highlights implementation challenges, and discusses the role of government agencies, social workers, and

civil society organizations in preventing elder abuse. The study concludes that stronger enforcement, increased public awareness, improved access to justice, and coordinated support services are essential for ensuring the safety, dignity, and well-being of older persons. The findings provide recommendations for strengthening legal protections and promoting a more responsive system for addressing elder abuse.

Introduction

Elder abuse is a serious social, legal, and human rights issue affecting millions of older persons across the world. As life expectancy increases and the elderly population grows, protecting the dignity, safety, and well-being of older adults has become an important responsibility of governments, communities, families, and institutions. Elder abuse includes any act or failure to act that causes harm or distress to an older person within a relationship where trust is expected. It may occur in homes, communities, healthcare institutions, old-age homes, or other care settings.

Elder abuse takes many forms, including physical abuse, emotional or psychological abuse, sexual abuse, financial exploitation,

neglect, and abandonment. Many older persons suffer in silence because of fear, dependency on family members, social stigma, lack of awareness, or limited access to legal remedies. As a result, a large number of cases remain unreported, making elder abuse a hidden but widespread problem.

Concept and Definition of Elder Abuse

Concept of Elder Abuse

Elder abuse refers to any act or failure to act that causes harm, distress, or suffering to an older person. It can occur within families, communities, institutions, or caregiving settings where there is an expectation of trust. Elder abuse may be intentional or unintentional and can affect the physical, emotional, social, financial, and psychological well-being of older adults. It is recognized as a serious human rights and public health issue because it violates the dignity, safety, and rights of older persons.

With increasing life expectancy and population ageing, elder abuse has become a growing concern worldwide. Older persons may face abuse due to dependency, social isolation, disability, poor health, financial dependence, or changing family structures.

Preventing elder abuse requires strong legal protections, effective public policies, awareness, and community support.

Definitions of Elder Abuse

1. **World Health Organization (WHO):** "Elder abuse is a single or repeated act, or lack of appropriate action, occurring within any relationship where there is an expectation of trust, which causes harm or distress to an older person."
2. **United Nations (UN):** Elder abuse refers to any form of violence, neglect, exploitation, or discrimination against older persons that affects their rights, dignity, health, or well-being.
3. **National Centre on Elder Abuse (NCEA), USA:** Elder abuse is intentional or negligent acts by a caregiver or trusted person that cause harm or create a serious risk of harm to an older adult.
4. **Maintenance of Parents and Senior Citizen Act, 2007 (India):** While the Act does not provide a specific definition of "elder abuse," it recognizes neglect, abandonment,

and failure to provide maintenance and welfare to parents and senior citizens as legal issues requiring protection.

Review of Literature

1. World Health Organization (WHO. 2022)

WHO defines elder abuse as any act or failure to act within a relationship of trust that causes harm or distress to an older person. It identifies physical, emotional, sexual, financial abuse, and neglect as the major forms and emphasizes stronger legal protection and awareness.

2. United Nations (2002)

The Madrid International Plan of Action on Ageing stresses the protection of older persons' human rights and recommends legal reforms, social security, healthcare, and community participation to prevent elder abuse.

3. HelpAge India (2023)

HelpAge India reports that financial abuse, emotional abuse, neglect, and disrespect are among the most common forms of elder

abuse in India. Many cases remain unreported due to fear and family pressure.

4. National Crime Records Bureau (NCRB)

NCRB data indicate increasing reports of crimes against senior citizens, including financial fraud, assault, and neglect, highlighting the need for stronger legal protection.

5. Ministry of Social Justice and Empowerment

The Ministry introduced policies and welfare schemes aimed at improving the quality of life of senior citizens through financial support, healthcare, and legal protection.

6. Maintenance and Welfare of Parents and Senior Citizens Act, 2007

Several researchers note that this Act provides legal support for maintenance and welfare but faces implementation challenges due to lack of awareness and procedural delays.

7. Research by Dong (2015)

Dong highlights elder abuse as a hidden issue affecting physical and mental health, emphasizing multidisciplinary interventions involving legal, medical, and social services.

8. Research by Pillemer et al. (2016)

The authors stress that prevention of elder abuse requires coordinated efforts among governments, healthcare providers, law enforcement agencies, and communities.

Causes and risk factor of Elder abuse: The major causes include family conflicts, financial dependence, caregiver stress, poverty, substance abuse, social isolation, lack of awareness, declining health of older persons, and weak enforcement of laws.

Prevalence of Elder Abuse: Elder abuse is increasing due to rapid urbanization, migration of younger family members, and changing family values. Many cases remain unreported because older persons fear retaliation, dependency, or social stigma.

Human Rights of Older Persons:

Human rights of older persons are the basic rights and freedoms that every elderly person is entitled to enjoy without discrimination

based on age. These rights are derived from the principles of equality, dignity, freedom, and justice, Older persons have the right to life, dignity, equality, health care, social security, property, protection from violence, and participation in society. These rights are recognized under national constitutions and international human rights principles.

International Legal and Policy Frameworks: International efforts include the United Nations Principles for Older Persons (1991), the Madrid International Plan of Action on Ageing (2002), the Universal Declaration of Human Rights, and the WHO Global Strategy on Ageing and Health. These frameworks encourage governments to protect older persons from abuse and ensure healthy ageing.

Role of Law Enforcement and the Judiciary: Police, courts, legal services authorities, and tribunals help protect senior citizens by receiving complaints, ensuring maintenance, preventing abuse, and providing legal remedies. They play an important role in enforcing laws and safeguarding the rights of older persons.

Role of Social Workers in Preventing Abuse: Social workers identify cases of abuse, provide counselling, create awareness, conduct home visits, support families, coordinate with legal authorities, advocate for the rights of older persons, and connect them with welfare schemes and community resources.

Challenges in the implementation of Laws and Policies: Major challenges include low awareness, under-reporting of abuse, lack of trained professionals, social stigma, weak implementation of laws, financial dependency of older persons, shortage of care institutions, and limited access to legal aid in rural areas.

Key Government Policies and Welfare Schemes of Senior Citizens: Major schemes include:

1. National Policy on Older Persons, 1999.
2. National Policy for Senior Citizens, 2011.
3. Atal Vayo Abhyuday Yojana (AVYAY).
4. Indira Gandhi National Old Age Pension Scheme (IGNOAPS).

5. Rashtriya Vayoshri Yojana.
6. Elder Helpline (14567).

Best Practices and International Experiences: Countries such as Canada, Australia, the United Kingdom, and Japan have established elder abuse helplines, mandatory reporting systems, community support services, and awareness campaigns. These practices can guide improvements in India's elder protection system.

Types of Elder Abuse

Elder abuse refers to any intentional act or failure to act that causes harm, distress, or risk to an older person. It may occur in family settings, institutions, or the community. Understanding the different forms of elder abuse is essential for developing effective legal and policy measures to protect older adults. The major types of elder abuse are as follows:

- 1) Physical Abuse:** Physical abuse involves the intentional use of force that causes pain, injury, or physical harm to an older person. It includes hitting, slapping, pushing, kicking, burning, restraining, or improper use of medication. Victims may have

bruises, fractures, cuts, or unexplained injuries.

- 2) Emotional or Psychological Abuse:**

Emotional abuse refers to verbal or non-verbal actions that cause mental pain, fear, or emotional distress. It includes insults, humiliation, threats, intimidation, isolation, and controlling behaviour. Victims often experience anxiety, depression, low self-esteem, and social withdrawal.

- 3) Financial or Economic Abuse:**

Financial abuse occurs when an elderly person's money, property, pension, or other assets are used illegally or without their consent. Examples include theft, fraud, forgery, coercion to sign legal documents, misuse of bank accounts, and denial of access to financial resources. This form of abuse often leaves older adults financially dependent and insecure.

- 4) Neglect:** Neglect is the failure of a caregiver or responsible person to provide essential care required for the well-being of an older adult. This includes failure to provide food, clean clothing, shelter, medical treatment,

hygiene, emotional support, or protection from harm. Neglect may be intentional or unintentional due to lack of knowledge or resources.

5) Sexual Abuse: Sexual abuse includes any non-consensual sexual contact, harassment, or exploitation of an older person. It may involve unwanted touching, forced sexual acts, or exposing the individual to sexually explicit material. Elderly victims may experience physical injuries, emotional trauma, and long-term psychological effects.

6) Abandonment: Abandonment occurs when a caregiver or family member deserts an elderly person who depends on them for care and support. This may involve leaving the older person alone without necessary assistance or refusing to continue caregiving responsibilities.

7) Self Neglect: Self-neglect occurs when an older person is unable or unwilling to care for their own health, hygiene, nutrition, or safety. It may result from physical illness, cognitive impairment, mental health conditions, or social isolation.

Although it is different from abuse by others, it requires timely intervention from health and social service professionals.

8) Social Abuse and Isolation: Social abuse involves preventing an elderly person from maintaining relationships with family, friends, or participating in community activities. Isolation increases loneliness, depression, and vulnerability to other forms of abuse.

9) Institutional Abuse: Institutional abuse occurs in hospitals, nursing homes, old-age homes, or other residential care facilities. It includes poor quality of care, neglect, physical or emotional abuse by staff, inadequate medical attention, violation of dignity, and denial of basic rights. Weak monitoring and insufficient accountability often contribute to institutional abuse.

10) Digital and Cyber Abuse: With increasing use of technology, older adults are becoming vulnerable to cyber abuse. This includes online financial fraud, identity theft, phishing, scams, cyberbullying, and

unauthorized access to personal information. Limited digital literacy makes many elderly individuals easy targets for cybercriminals.

Constitutional Provisions for the Protection of Older Persons in India

The Constitution of India does not contain a separate chapter specifically for older persons. However, it provides several Fundamental Rights and Directive Principles of State Policy (DPSPs) that protect the dignity, welfare, and social security of senior citizens. These provisions form the constitutional foundation for laws and welfare schemes aimed at protecting older persons.

1) Article 14- Right to Equality:

Article 14 guarantees equality before the law and equal protection of the laws to all citizens, including older persons. It ensures that elderly individuals cannot be discriminated against arbitrarily and are entitled to equal legal protection.

2) Article 21- Right to Life and Personal Liberty: Article 21 guarantees every person the right to life with dignity. The Supreme Court

has interpreted this right broadly to include a dignified life, access to healthcare, shelter, and protection from neglect and abuse. This constitutional guarantee is particularly important for senior citizens.

3) Article 41- Public Assistance in Older Age:

Article 41, a Directive Principle of State Policy, directs the State to provide public assistance in cases of old age, sickness, disability, and unemployment, subject to its economic capacity. This is the most significant constitutional provision concerning older persons and forms the basis for many welfare schemes and laws for senior citizens.

4) Article 46: Protection of Weaker Sections:

Article 46 requires the State to promote the educational and economic interests of weaker sections of society and protect them from social injustice and exploitation. Older persons, particularly those who are economically or socially vulnerable, benefit from this constitutional principle.

Methodology

The study adopts a qualitative descriptive approach based on secondary data. Information has been collected from government reports, books, journal articles, legal documents, policy reports, WHO publications, HelpAge India reports, and official websites. The collected information was analyzed to understand the strengths and limitations of existing legal and policy frameworks related to elder abuse.

Research Design

The descriptive research design was adopted to describe and analyze the legal provisions, government policies, and institutional mechanisms available to protect older persons from abuse in India.

Descriptive Study

Sampling

- **Sampling Technique:** Purposive Sampling
- **Sample Size:** Relevant legal documents, government policies, research articles, journals, reports, and Acts related to elder abuse.

Data Analysis

The collected secondary data were analyzed using **qualitative content analysis**. The provisions of various laws and policies were compared to identify their strengths, limitations, and effectiveness in addressing elder abuse.

Laws Reviewed

1. Maintenance and Welfare of Parents and Senior Citizens Act, 2007
2. Constitution of India (Articles 21, 41, and 46)
3. National Policy on Older Persons, 1999
4. National Policy for Senior Citizens, 2011
5. Protection of Women from Domestic Violence Act, 2005
6. Bharatiya Nyaya Sanhita, 2023 (relevant criminal provisions)
7. Human Rights Act, 1993
8. United Nations Principles for Older Persons (1991)
9. Madrid International Plan of Action on Ageing (2002)

10. Sustainable Development Goals (SDGs) related to healthy ageing and social justice

Findings

- Elder abuse remains underreported due to fear, dependency, and lack of awareness.
- Existing laws provide legal protection but their implementation is inconsistent.
- Many senior citizens are unaware of their legal rights and available support services.
- Financial abuse and neglect are increasing with changes in family structures.
- Coordination among government departments, police, healthcare providers, and NGOs is often inadequate.
- Legal aid and counselling services for elderly victims are limited, especially in rural areas.
- Greater public awareness and community participation are needed to prevent elder abuse.

Recommendations and Suggestions

1. Strengthen implementation of existing laws protecting senior citizens.
2. Increase awareness through public education and media campaigns.
3. Establish elder helplines and counselling centres in every district.
4. Train police, healthcare workers, and social workers to identify and respond to elder abuse.
5. Promote legal literacy among older persons and their families.
6. Strengthen financial security measures for senior citizens.
7. Encourage community-based support groups and volunteer services.
8. Improve coordination between government agencies and non-governmental organizations.
9. Conduct regular research and national surveys on elder abuse.
10. Develop age-friendly policies that ensure dignity, safety, and social inclusion.

Conclusion

Elder abuse is a growing concern that affects the dignity, health, and well-being of older persons. India has developed several legal and policy frameworks to protect senior citizens, but effective implementation remains a challenge. Stronger enforcement of laws, increased awareness, accessible support services, and active community participation are essential to prevent elder abuse. A coordinated approach involving government, families, civil society, healthcare professionals, and social workers can create a safer and more supportive environment for older adults. Protecting elderly persons is not only a legal obligation but also a social and moral responsibility.

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3. Ethics Approval:

Ethics approval was not required for this study as it did not involve human/animal subjects.

4. Informed Consent:

Yes, informed written consent was obtained from all participants.

5. Data Availability Statement:

The data that support the findings of this study are available upon reasonable request from the corresponding author.

6. Author Contributions (Credit Statement):

- ☐ Author 1: Conceptualisation, Methodology, Writing – Original Draft
- ☐ Author 2: Data Curation, Formal Analysis, Writing – Review & Editing

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6. *Constitution of India.*
7. *Protection of Women from Domestic Violence Act, 2005.*
8. *Madrid International Plan of Action on Ageing (2002).*
9. *National Human Rights Commission. Reports on Senior Citizens.*
10. *Journal of Elder Abuse & Neglect (Selected Research Articles).*

Article:

Bonded to Bots: AI Companion Applications, Parasocial Attachment, and the Psychological Vulnerability of Young Adults

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ABSTRACT

AI companion applications such as Replika and Character.AI are gaining popularity among young adults looking for emotional support and connection. In contrast to social media or search engines, these applications are specifically designed to mimic genuine relationships — they provide personal responses, retain conversations, and simulate emotional understanding. Research in India indicates that almost 60% of young adults now seek emotional support from AI, raising serious concerns among mental health professionals. This paper investigates an essential issue: what are the psychological effects on young adults when they establish emotional connections with AI companions? Drawing on Bowlby's Attachment Theory and Ainsworth's attachment styles as a basis, this paper posits that young adults with insecure attachment — whether seeking intimacy or shunning it — are particularly attracted to these apps. Instead of assisting them in developing healthier relationships, these apps might actually increase their

attachment insecurities. This is because genuine relationships include rejection, conflict, and resolution — encounters that foster emotional strength. AI companions eliminate all of that discomfort entirely. This paper concludes that AI companion apps are being designed to create emotional dependency for profit, without any clinical guidelines or regulations to protect vulnerable users. It calls for the urgent development of evidence-based frameworks to govern these platforms, particularly for young adult populations.

Keywords: *AI companion applications, Attachment theory, Parasocial relationships, Emotional dependency, Mental health regulation*

Introduction

The way young adults seek emotional connection is changing rapidly. In the past decade, artificial intelligence has moved beyond productivity tools and search engines into deeply personal territory — companionship, emotional support, and intimate conversation. Applications like Replika and Character.AI now offer users a relationship that is always available, never judgmental, and extremely patient. For

millions of young adults navigating loneliness, social anxiety, and the pressures of emerging adulthood, these apps have become a primary source of emotional support.

This shift raises serious psychological concerns. Human relationships are complex, unpredictable, and sometimes painful, and it is precisely that complexity that builds emotional resilience and attachment security over time. AI companions strip away that complexity entirely. They are designed to please, validate, and retain users. From a clinical perspective, this is not neutral — it is a deliberate manipulation of psychological needs for commercial gain.

Young adults aged 18–25 are especially vulnerable to these dynamics. This developmental stage is critical for forming relational identities, consolidating attachment patterns, and building the interpersonal skills that sustain long-term mental health. Disrupting this process through prolonged AI companionship engagement has implications that the mental health field has only begun to examine.

This paper addresses that gap by applying Bowlby's Attachment Theory and

Ainsworth's attachment style classifications to AI companion app engagement among young adults, and argues for urgent clinical and regulatory attention to this growing phenomenon.

Literature Review

The emergence of AI companion applications represents a significant shift in how humans seek emotional connection in digital environments. Replika (launched in 2017) and Character.AI (launched in 2022) are among the most prominent platforms designed specifically to simulate emotional intimacy rather than facilitate productivity or information exchange. Unlike conventional digital tools, these applications are engineered to remember personal details, respond with emotional sensitivity, and adapt to user preferences over time, creating what Maeda and Quan-Haase (2024) describe as seemingly reciprocal interactions that may evolve into parasocial bonds.

Parasocial relationships are defined as one-sided emotional bonds in which an individual develops attachment toward a figure who cannot genuinely reciprocate. Giles (2002) established the foundational framework for understanding parasocial interaction,

identifying the psychological mechanisms through which audiences form meaningful emotional connections with mediated figures. This concept has since been extended to human-AI interactions. Lipin (2025) introduced the term synthetic attachment to describe the emotionally reactive bonds users form with AI companions, positioning these bonds as a novel and clinically distinct relational phenomenon.

Bowlby's Attachment Theory, originally developed during the 1950s and 1960s, proposes that humans are biologically predisposed to seek close emotional bonds, and that early caregiving experiences create internal working models that shape relational behaviour throughout life. Ainsworth subsequently identified three attachment styles — secure, anxious, and avoidant — providing a clinically useful framework for understanding individual differences in relational behaviour. Simpson (1990) demonstrated that these styles significantly influence adult romantic relationships, while Hartmann (2016) established a direct empirical link between insecure attachment orientations and the formation of stronger parasocial bonds.

Research on AI companion applications has begun to document concerning patterns of emotional dependency. Laestadius et al. (2024) conducted a grounded theory analysis of Replika users, identifying mental health harms facilitated by emotional dependency resembling patterns seen in human relationships, including role reversal in which users attended to the perceived emotional needs of their AI companion. Xie et al. (2023) documented users engaging with AI companions in roles typically reserved for human relationships — as friends, mentors, and romantic partners. De Freitas et al. (2025) found that AI companions reduce loneliness in the short term, while Borvén (2023) noted that sustained engagement may generate dependency patterns resembling addictive behaviour.

Conceptual Framework and Approach

This paper adopts a conceptual and theoretical methodology, drawing on a systematic review of existing psychological literature to construct an analytical framework for understanding AI companion application engagement among young adults. Rather than collecting primary empirical data, this paper synthesises established theoretical perspectives and emerging

research findings to develop a coherent argument regarding the psychological implications of human-AI emotional bonding.

The primary theoretical lens employed is Bowlby's Attachment Theory, supplemented by Ainsworth's attachment style classifications. These frameworks are applied to the phenomenon of AI companion application use to examine how pre-existing attachment orientations may shape — and be shaped by — engagement with emotionally responsive AI platforms. Secondary sources including peer-reviewed journal articles, conference proceedings, and published reports from mental health organisations are utilised to contextualise and support the theoretical analysis.

This approach is appropriate given the nascent nature of AI companionship as a psychological phenomenon. The technology is sufficiently recent that longitudinal empirical studies examining its clinical impact remain limited. A conceptual paper therefore serves an important foundational function — establishing the theoretical groundwork upon which future empirical research can be built.

Theoretical Analysis

Applying attachment theory to AI companion engagement reveals a pattern of differential psychological risk depending on the user's attachment orientation. For young adults with anxious attachment styles, AI companions appear to offer precisely what they seek — unconditional availability, constant validation, and a relationship entirely free from the threat of abandonment. However, this apparent solution is clinically counterproductive. Anxious attachment is characterised by excessive reassurance-seeking that does not build genuine relational trust. AI companions provide maximum reassurance with zero relational unpredictability, reinforcing dependency rather than resolving the underlying insecurity.

For young adults with avoidant attachment styles, AI companions offer intimacy without vulnerability. Avoidant individuals suppress emotional needs and maintain distance in human relationships due to a perceived threat of rejection. The frictionless environment of AI companionship feels comfortable, but this comfort entrenches emotional suppression and avoidance of genuine intimacy, making authentic human connection increasingly

difficult over time. Xie et al. (2023) documented that users engage with AI companions as friends, mentors, and romantic partners — roles that map directly onto the relational needs of both anxious and avoidant attachment styles.

Critically, the design of these applications is not incidental. AI companion platforms are commercially driven entities whose revenue depends on sustained emotional engagement. Engineering dependency is the business model, not a side effect. Young adults with insecure attachment styles — already predisposed to seeking external validation and avoiding relational discomfort — represent the most susceptible demographic for this model. Laestadius et al. (2024) documented role reversal among Replika users, where users began attending to the perceived emotional needs of their AI companion, mirroring patterns of codependency observed clinically in human relationships.

This risk is amplified considerably in the Indian context. Data from the Future Shift Labs Youth Pulse Survey indicates that nearly 60% of Indian young adults turn to AI tools for emotional comfort. The Annual National Conference of the Indian Psychiatric Society

in January 2026 reported that 60% of mental health conditions in India occur among individuals under 35, with AI dependency flagged as a growing clinical concern. Three structural factors compound this vulnerability — deeply embedded mental health stigma preventing help-seeking behaviour, a severe shortage of mental health professionals with only 0.3 psychiatrists per 100,000 people compared to the global average of 1.7, and rapid urbanisation disrupting traditional collectivist support systems. Dey (2024) specifically highlighted that existing data protection frameworks in India are insufficient to address the psychological risks posed by emotionally manipulative AI platforms.

Clinical Implications and Recommendations

The clinical implications of AI companion application use among young adults remain largely unaddressed within existing mental health frameworks. Clinicians working with young adult populations must develop awareness of AI companion usage as a potential contributing factor in presenting problems. A client presenting with social withdrawal, difficulty forming intimate relationships, or intensifying attachment

insecurities may be engaging with AI companions in ways that maintain or worsen their difficulties. Without clinical awareness of this phenomenon, these contributing factors risk going unidentified and untreated in therapeutic settings.

AI companion applications represent a novel form of maladaptive coping — one that appears beneficial in the short term while generating significant psychological harm over time. Just as clinicians routinely assess social media use, gaming habits, and substance use as part of comprehensive psychological evaluations, AI companion usage must be incorporated into standard assessment protocols for young adult populations.

At the regulatory level, the implications are equally urgent. Wies et al. (2021) noted that ethical and regulatory frameworks for digital mental health tools remain critically underdeveloped — a gap that is particularly dangerous given the rapid commercial proliferation of emotionally manipulative AI platforms operating without clinical oversight or mandatory mental health safeguards. This paper makes three specific recommendations. First, mandatory disclosure requirements must be established

for AI companion applications, clearly informing users of the psychological risks associated with emotional dependency. Second, independent clinical oversight boards should review the psychological design features of AI companion applications prior to public release. Third, age-specific protections must be implemented for young adult users, including built-in referral pathways directing users toward professional mental health support when dependency patterns are identified.

Conclusion

This paper highlights the psychological risks posed by AI companion applications, particularly for young adults with insecure attachment styles. Drawing on Bowlby's Attachment Theory and Ainsworth's attachment style framework, it demonstrates how individuals with anxious or avoidant attachment patterns may be especially vulnerable to the emotionally responsive environments these applications create. While these platforms may appear supportive, they are often designed in ways that encourage prolonged engagement and dependency rather than genuine emotional growth.

In the Indian context, this concern is amplified considerably. Mental health stigma, limited access to trained professionals, and the pressures of rapid urbanisation already place significant strain on young adult wellbeing. Within such an environment, AI companion platforms may easily fill emotional gaps without offering the safeguards that professional mental health support provides.

Currently, very few clinical guidelines or regulatory frameworks address the psychological implications of these technologies. Waiting for long-term empirical evidence before responding could allow harmful dependency patterns to develop unchecked. The mental health community, researchers, and policymakers must begin developing ethical and regulatory frameworks now to ensure that AI companion technologies support — rather than undermine — psychological wellbeing.

Declaration of Originality

I hereby declare that this paper is my original work and has not been submitted for publication or presented at any other journal or conference in its current form. All sources used have been duly acknowledged and cited

in accordance with APA format. This paper does not contain any plagiarised content.

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Article

Digital Distress: Analysing The Effects Of Online Gaming On University Students' Perceived Stress And Quality Of Life

Article History

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Abstract

Online gaming has become one of the most popular forms of digital entertainment among university students due to the widespread availability of smartphones, computers, and internet access. While gaming offers relaxation, entertainment, and opportunities for social interaction, excessive gaming may negatively affect students' mental health and overall well-being. The present study examined the relationship between online gaming, perceived stress, and quality of life among university students. A quantitative research design was adopted using standardized instruments, namely the Internet Gaming Disorder Test (IGD-20), the Perceived Stress Scale (PSS), and the WHOQOL-BREF. Data were collected from 100 university students aged 20–25 years from Northeast India. Independent sample t-tests and Pearson correlation analyses were used to analyse the data. The findings revealed that male students reported

significantly higher perceived stress, while female students reported better quality of life. Online gaming showed a positive relationship with perceived stress and a negative relationship with quality of life.

Perceived stress was also strongly negatively associated with quality of life. The study highlights the importance of balanced gaming habits, stress management, and mental health support within universities to improve students' overall well-being.

Keywords:

Online Gaming, Internet Gaming Disorder, Perceived Stress, Quality of Life, University Students, Mental Health

Introduction

Online gaming has become an important part of students' daily lives because of the rapid growth of digital technology and easy access to the internet. Many university students play online games for entertainment, relaxation, social interaction, and to relieve academic stress. Multiplayer games also allow students to communicate and compete with people from different parts of the world. Although gaming can be enjoyable and beneficial when practiced in moderation, excessive gaming

has raised concerns regarding its effects on students' mental health and well-being.

University students often experience academic pressure, examinations, financial concerns, and uncertainty about future careers. These challenges can increase stress levels, leading some students to use online gaming as a coping strategy. While gaming may provide temporary relief from stress, excessive involvement can interfere with academic responsibilities, sleep, physical activity, and social relationships. Over time, these changes may contribute to increased stress and a decline in overall quality of life. Perceived stress refers to an individual's evaluation of life situations as stressful or difficult to manage, whereas quality of life reflects an individual's physical, psychological, social, and environmental well-being. Previous studies have suggested that excessive online gaming is associated with higher stress levels and poorer quality of life. However, limited research has focused on university students from Northeast India. Therefore, the present study aimed to examine the relationship between online gaming, perceived stress, and quality of life among university students while also exploring gender differences in these

variables. The findings are expected to contribute to a better understanding of students' digital behaviour and support the development of effective mental health interventions within higher education institutions.

Literature Review

Online gaming has become increasingly popular among university students because of the rapid advancement of technology and easy access to digital devices. Games are no longer viewed only as a form of entertainment but have become a part of students' daily routine. Many students play games to relax, reduce boredom, interact with friends, or temporarily escape from academic stress. Although moderate gaming can provide enjoyment and social connection, excessive gaming has raised concerns regarding its impact on mental health and overall well-being.

The concept of Internet Gaming Disorder (IGD) has received considerable attention in recent years. The World Health Organization recognized Gaming Disorder as a behavioural condition characterized by impaired control over gaming, increasing priority given to gaming over other activities,

and continuation of gaming despite negative consequences. Students who develop problematic gaming habits often spend several hours playing games, neglect academic responsibilities, experience disturbed sleep, and reduce participation in physical and social activities. These behaviours may eventually affect both psychological and physical health. Several researchers have examined the relationship between online gaming and perceived stress. Studies indicate that students experiencing high academic pressure, family expectations, or personal difficulties often use gaming as a coping strategy. Initially, gaming may provide temporary emotional relief and distraction from stressful situations. However, excessive gaming may become maladaptive because students avoid dealing with real-life problems. As gaming time increases, unfinished academic work, lack of sleep, and poor time management may create additional stress. Research therefore suggests that problematic gaming is associated with increased perceived stress rather than long-term stress reduction.

Previous studies have also found that excessive gaming is associated with anxiety, depression, emotional exhaustion, and sleep

disturbances. Students who spend many hours gaming often experience irregular sleep schedules, fatigue, poor concentration, and reduced academic performance. These psychological and behavioural changes can negatively affect daily functioning and increase emotional distress. Researchers have also reported that excessive gaming may reduce face-to-face social interaction, resulting in loneliness and weaker interpersonal relationships.

Quality of life is another important factor examined in gaming research. It refers to an individual's overall perception of physical health, psychological well-being, social relationships, and environmental satisfaction. Healthy students generally maintain balanced lifestyles that include academic activities, recreation, physical exercise, and social interaction. However, excessive gaming may disrupt these routines. Students with problematic gaming behaviour often report lower life satisfaction, poorer physical health, decreased motivation, and weaker social relationships. These findings suggest that gaming behaviour can influence several dimensions of quality of life.

Despite these concerns, some studies have highlighted positive aspects of gaming. Moderate gaming may improve cognitive skills, problem-solving ability, teamwork, and decision-making. Multiplayer online games can encourage communication and cooperation among players, helping students build friendships and social support networks. During the COVID-19 pandemic, online games also provided opportunities for social connection when face-to-face interaction was limited. These findings suggest that gaming itself is not harmful; instead, negative consequences occur when gaming becomes excessive and interferes with daily responsibilities.

Gender differences have also been widely discussed in the literature. Several studies have reported that male students spend more time playing online games and are more likely to develop problematic gaming behaviours than female students. Male gamers often engage in competitive games that encourage prolonged gaming sessions, whereas female students generally report lower gaming frequency and healthier lifestyle patterns. However, researchers also emphasize that gaming behaviour may vary depending on cultural background,

educational environment, and personal coping strategies.

Although numerous international studies have examined gaming and mental health, limited research has focused on university students from Northeast India. Cultural differences, educational experiences, and access to technology may influence gaming behaviour and its psychological outcomes. Therefore, the present study addresses this gap by examining the relationship between online gaming, perceived stress, and quality of life among university students in Northeast India. The findings contribute to existing literature and provide useful information for universities to design awareness programmes, counselling services, and mental health interventions that encourage balanced gaming habits and improve students' overall well-being.

Methodology

The present study adopted a quantitative cross-sectional research design to examine the relationship between online gaming, perceived stress, and quality of life among university students. A total of 100 university students aged 20–25 years from different

universities in Northeast India participated in the study. The sample consisted of 50 male and 50 female students, selected using simple random sampling to ensure equal gender representation.

Data were collected using standardized psychological instruments. The Internet Gaming Disorder Test (IGD-20) was used to assess gaming behaviour, the Perceived Stress Scale (PSS) measured participants' perceived stress levels, and the WHOQOL-BREF assessed quality of life across physical, psychological, social, and environmental domains. Participants completed the questionnaires after providing informed consent, and confidentiality was maintained throughout the study.

The collected data were analysed using SPSS Version 30. Independent sample t-tests were conducted to examine gender differences in perceived stress and quality of life, while Pearson Product-Moment Correlation was used to determine the relationship between online gaming, perceived stress, and quality of life. Statistical significance was determined at the 0.05 level.

Analysis & Findings

The findings of the study revealed significant relationships between online gaming, perceived stress, and quality of life among university students. Male students reported significantly higher perceived stress ($M = 30.74$, $SD = 3.88$) than female students ($M = 28.64$, $SD = 5.60$). On the other hand, female students reported significantly better quality of life ($M = 9.42$, $SD = 4.52$) compared to male students ($M = 7.80$, $SD = 3.00$). These findings suggest that male students may be more vulnerable to stress associated with excessive online gaming.

Correlation analysis further demonstrated a significant positive relationship between online gaming and perceived stress ($r = .568$, $p < .01$). This indicates that students who spent more time gaming or showed higher gaming disorder scores also reported higher levels of stress. One possible explanation is that prolonged gaming may interfere with academic responsibilities, reduce sleep quality, and increase emotional pressure, thereby contributing to higher stress levels.

The study also found a significant negative relationship between online gaming and quality of life ($r = -.438$, $p < .01$). Students with greater gaming involvement reported lower levels of physical health, psychological

well-being, social relationships, and environmental satisfaction.

Excessive gaming may reduce participation in physical activities, limit face-to-face interactions, and disrupt healthy daily routines, leading to poorer quality of life.

The strongest relationship observed in the study was between perceived stress and quality of life ($r = -.828$, $p < .01$). Students experiencing higher levels of stress reported substantially lower quality of life. This finding highlights the importance of stress management and healthy coping

strategies in maintaining students' overall well-being. The results support previous research suggesting that excessive online gaming may indirectly reduce quality of life by increasing stress and disrupting healthy lifestyle behaviours.

Overall, the findings indicate that balanced gaming habits are essential for maintaining good mental health. Universities should encourage responsible gaming practices, provide counselling services, and promote stress management programmes to support students' psychological well-being.

Conclusion

The present study examined the relationship between online gaming, perceived stress, and quality of life among university students. The findings demonstrated that excessive online gaming was associated with higher perceived stress and poorer quality of life. Male students experienced significantly higher stress levels, whereas female students reported better quality of life. In addition, students with higher perceived stress experienced lower levels of overall wellbeing, highlighting the close relationship between stress and quality of life.

Although online gaming can provide entertainment, relaxation, and opportunities for social interaction, excessive involvement may interfere with academic performance, sleep, physical health, and social relationships. Therefore, maintaining a healthy balance between gaming and daily responsibilities is essential. Universities should strengthen mental health services, organize awareness programmes on responsible gaming, and encourage healthy coping strategies such as physical activity, social engagement, and effective time management.

The study contributes to the growing literature on digital well-being by providing evidence from university students in Northeast India. Future research should include larger and more diverse samples, longitudinal designs, and additional variables such as resilience, sleep quality, social support, and academic performance to gain a broader understanding of the long-term effects of online gaming.

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4. Informed Consent:

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6. Author Contributions (Credit Statement):

☐ Author 1: Conceptualisation, Methodology, Writing – Original Draft

☐ Author 2: Data Curation, Formal Analysis, Writing – Review & Editing

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Aggressive Behaviour and Perceived Stress Among Corporate

Article History

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Abstract

Corporate work today rarely feels calm. Tight deadlines, shifting targets and constant performance pressure have become part of daily routine for most employees, and how a person copes with that pressure often shows up in how they treat the people around them. This study looked at the relationship between aggressive behaviour and perceived stress among 175 employees working in corporate organizations. A quantitative, cross-sectional, correlational design was used. Data were collected through two standardised self-report tools: the Buss–Perry Aggression Questionnaire, which measures physical aggression, verbal aggression, anger and hostility, and the Perceived Stress Scale, which measures how far everyday situations are appraised as stressful or unmanageable. Responses were analysed using Pearson’s product-moment correlation, and the results showed a statistically significant, moderate positive correlation between aggressive behaviour and perceived stress ($r = .514$, $p < .001$). In other words, employees who

reported feeling more stressed at work also tended to report more aggressive behaviour. This supports the study's alternative hypothesis and fits with existing theoretical models of stress and aggression, particularly the General Aggression Model and the transactional theory of stress. The findings suggest that stress which is left unmanaged does not stay contained to the individual; it tends to spill outward into interpersonal behaviour and, over time, into the broader climate of the workplace. On this basis, organisations are encouraged to take stress management seriously, not as an optional wellness add-on but as a genuine part of maintaining a healthy and cooperative work environment.

Keywords: aggressive behaviour, perceived stress, corporate employees, workplace stress, employee well-being, organisational behaviour

Introduction

Working in a corporate environment rarely matches the neat picture a job description paints. Instead of a fixed list of tasks completed calmly, most employees deal with a constant stream of deadlines, targets that get revised almost as soon as they are met, back-

to-back meetings, and a general expectation of being reachable at all hours. Over the last couple of decades, as organisations have leaned harder into performance metrics and competitive benchmarking, this kind of pressure has stopped feeling like an exception. For a lot of employees, it is simply what an ordinary Tuesday at work looks like.

Because this pressure is so routine, it often goes unquestioned. Employees learn to live with it, and organisations tend to treat a certain baseline of stress as an unavoidable part of doing business. A moderate amount of pressure is not necessarily a bad thing; it can sharpen focus and push people to perform. Problems tend to start when that pressure builds up without any real outlet or resolution. When this happens, it does not stay confined to a person's private thoughts for long. It tends to show up in how that person speaks to a colleague, reacts to feedback, or handles a plan that falls apart at the last minute.

One of the clearer signs that stress has moved from manageable pressure into something more corrosive is aggression. This is rarely physical in a corporate setting; physical aggression is uncommon and is usually dealt with quickly when it does happen. What

shows up far more often are subtler things: a shorter fuse than usual, a clipped tone with a colleague, patience wearing thin during discussions, sharper words in meetings, or simply withdrawing and becoming passive-aggressive instead of open. These behaviours often get brushed off as “just the deadline talking,” and in a narrow sense that might even be true. But an understandable cause does not make a behaviour harmless. If left unaddressed, this kind of low-grade friction can quietly wear down working relationships and change the character of an entire team, often without anyone being able to point to one clear incident that caused it.

It also matters that stress is not simply a property of the situation itself. Two employees can hold the same job title, carry almost identical workloads, and still end up experiencing very different levels of distress, because what matters most is not the event but how it gets appraised. This is the basic idea behind Lazarus and Folkman’s (1984) transactional model of stress, which

treats stress as something that emerges from the interaction between a person and their environment rather than from the environment on its own. A similar argument sits at the centre of Anderson and Bushman’s

(2002) General Aggression Model, which frames aggression as the result of a chain of internal states, including negative affect and physiological arousal, that get triggered once a situation is perceived as threatening or frustrating. Read side by side, these two frameworks point to a plausible pathway running from perceived stress to aggressive behaviour, and this is the pathway the present study set out to test among corporate employees, a group that has received noticeably less direct research attention than healthcare or education workers.

This does not stop with the individual employee, either. Once stress-driven irritability becomes a regular part of how a team interacts, the eventual outcome, if nothing changes, is often a toxic work culture marked by strained communication, misunderstandings, and a steady drop in productivity that becomes harder to reverse the longer it continues. Seen this way, understanding how stress turns into aggressive behaviour is not just an academic question. It speaks to something fairly practical: how organisations can catch the early, easily missed signs of stress-related behavioural change before those signs turn into settled patterns of conflict.

With this in mind, the present study set out to determine whether higher levels of perceived stress are associated with increased aggressive behaviour among corporate employees. Two hypotheses were tested:

H0: There is no significant relationship between aggressive behaviour and perceived stress among corporate employees.

H1: There is a significant relationship between aggressive behaviour and perceived stress among corporate employees.

Literature Review

There is no shortage of research connecting workplace stress to negative interpersonal and psychological outcomes. What is harder to find is research that looks at corporate employees specifically, as a group in their own right, rather than as part of a broader occupational mix.

A large share of the existing evidence comes out of healthcare, hospitality, and public-sector settings. Attell et al. (2017) found that workplace bullying and job-related stressors were closely tied to psychological distress, and that this association was not uniform; it varied by gender and race, which hints that demographic factors may shape how stress

and hostility play out. Hansen, Høgh, and Persson (2011) reported something similar, finding that employees who were exposed to frequent bullying showed measurable physiological stress responses along with poorer mental health, a pattern that lines up with their earlier work looking at bullying, health outcomes, and stress physiology together (Hansen et al., 2006). Høgh et al. (2012) took this further, showing that exposure to negative acts at work was tied to both psychological and physiological stress reactions. Across these three studies, the pattern is consistent: hostile treatment and stress responses tend to move together rather than sit apart.

Other researchers have approached the question from the opposite direction, looking at how stress and toxic conditions shape aggressive or counterproductive behaviour. Anjum et al. (2018) found that a toxic workplace environment was linked to reduced job productivity, which suggests that the behavioural fallout of stress carries a real organisational cost, not just a personal one. Rasool et al. (2020) reported a similar pattern, finding that workplace violence and occupational stress were associated with weaker sustainable work performance.

Johnson et al. (2018) found that workplace aggression undermined organisational effectiveness, partly through its effect on employee engagement. Li et al. (2022) added a leadership angle to this picture: abusive leadership behaviour was associated with greater job insecurity among employees, and this effect worked partly through emotional exhaustion and abusive behaviour between peers, showing how hostility that starts in one part of an organisation can ripple outward into others.

A separate group of studies has focused on the physiological and clinical costs of sustained occupational stress. Melchior et al. (2013) found that prolonged work stress predicted the later onset of depression and anxiety among young working adults, while Henderson et al. (2011) and

Harvey et al. (2017) each reported links between adverse working conditions and the development of common psychiatric disorders. Malamardi et al. (2015) documented reduced health-related quality of life among stressed public-sector bank employees, and Bendak et al. (2024) found elevated occupational stress among middle-aged professionals. Both studies point to the same broader idea: prolonged occupational

stress does not stay confined to the workplace but spills into an employee's overall health and daily functioning.

Organisational and environmental factors have also come up as contributors to how stress is experienced at work. Kim and Jung (2022) found that higher employee competency and a more positive organisational culture were both associated with lower perceived stress, which underlines just how much a supportive environment can buffer employees against everyday pressure, although their study stayed focused on organisational and individual-level factors rather than the interpersonal experiences that happen between colleagues. Hui and Aye (2018) found that features of workplace design, such as layout, environmental quality, lighting, and access to natural surroundings, had a positive effect on employees' psychological well-being and helped reduce occupational stress, though again this work concentrated on the physical environment rather than peer interaction. Pacheco et al. (2021) took a slightly different angle, finding that greater conflict between work and personal life was linked to lower employee well-being, while mindfulness helped employees cope more effectively with that

conflict. None of these studies, however, get at the specific role of peer aggressive behaviour, which is what the present study is interested in.

Research on incivility and ostracism offers another angle on the stress–aggression relationship. Samma et al. (2020) found that employees who experienced workplace ostracism and incivility reported greater job anxiety and lower levels of innovative work behaviour, showing that negative workplace interactions affect not just how employees feel but how effectively they work. In a healthcare setting, García-Izquierdo et al. (2025) found that employees exposed to workplace violence reported poorer psychological well-being, while higher resilience helped reduce some of these negative effects, suggesting that personal coping resources can soften, though clearly not remove, the consequences of hostile treatment at work. Taken with the studies above, this points to something worth keeping in mind: the pathway between stress and aggression is probably not a simple, one-directional chain, and personal or organisational resources likely shape how strongly the two are connected in any particular setting.

A smaller group of studies has looked specifically at customer-facing or service roles. Bi et al. (2021) found that stress caused by customer aggression in the restaurant industry was somewhat buffered by employee empowerment, while Cavallari et al. (2025) found that self-efficacy helped healthcare professionals cope with verbal aggression without it damaging their well-being or job satisfaction. Even outside human samples, Dantzer et al. (2017) found that stress hormones were tied to aggressive behaviour in cooperatively breeding meerkats, a reminder that the link between stress and aggression is not just an office phenomenon but seems to sit on a broader biological foundation.

Two theoretical frameworks anchor the present study. Anderson and Bushman's (2002) General Aggression Model proposes that aggressive behaviour comes from the interaction of person-level and situational inputs, which shape internal states, including hostile thinking, negative affect, and physiological arousal, and these in turn drive an aggressive appraisal and response. Berkowitz's (1989) reformulation of the frustration–aggression hypothesis adds that negative affect generated by frustration or

blocked goals can prime aggressive responses even without any deliberate intent to cause harm. On the stress side, Folkman and Lazarus's (1980, 1984) transactional model treats stress as a product of cognitive appraisal rather than the stressor itself, which is a useful way of explaining why two employees facing similar demands can end up reporting very different levels of distress.

Put together, this body of work points to a fairly consistent picture: workplace stress rarely stays a private, internal experience, and it rarely sorts itself out without some form of attention. What is still comparatively underexamined is the specific relationship between perceived stress and aggressive behaviour among corporate employees as their own group, and that is the gap the present study is trying to address.

Methodology

This study used a quantitative, cross-sectional, correlational design. The choice was deliberate: the aim was to see whether a measurable relationship exists between aggressive behaviour and perceived stress, not to establish causation through experimental manipulation. Data were collected from 175 corporate employees

using convenience sampling, a practical choice given the accessibility and time constraints that usually come with research involving working professionals.

Participants were corporate employees aged between 20 and 50, currently employed, with at least six months of work experience, who volunteered and gave informed consent. Interns, temporary trainees, unemployed individuals, and incomplete responses were all excluded, so that participants had enough exposure to sustained workplace demands to respond meaningfully to the questions asked.

Two standardised instruments were used. Aggressive behaviour was measured using the Buss–Perry Aggression Questionnaire (Buss & Perry, 1992), a 29-item, five-point Likert scale that covers four dimensions of aggression: physical aggression, verbal aggression, anger, and hostility. Perceived stress was measured using the Perceived Stress Scale (Cohen et al., 1983), a ten-item measure of how far recent life situations were appraised as stressful, unpredictable, or beyond one's control. Both tools are well established in occupational and clinical psychology research, with strong reliability and validity behind them.

Data were collected through an online questionnaire, starting with a demographic information sheet and followed by the BPAQ and the PSS-10. Before starting, participants received a short explanation of the study's purpose and were asked for informed consent, confirming they understood what participation involved and were willing to go ahead on that basis. Participants were assured of confidentiality, told they could withdraw at any point, and asked to answer honestly based on their actual workplace experience rather than what they thought was expected of them. Completed responses were checked for accuracy, and incomplete submissions were removed before analysis. Data were coded and analysed in SPSS, with significance set at

0.05. Pearson's product-moment correlation was used to test the central hypothesis linking aggressive behaviour and perceived stress. Ethical safeguards, including informed consent,

voluntary participation, confidentiality, and the right to withdraw without penalty, were maintained throughout, and no participant's individual responses were shared with their employer at any stage.

4. Analysis and Findings

Pearson's product-moment correlation was used to examine the relationship between aggressive behaviour, measured by the BPAQ, and perceived stress, measured by the PSS-10, across all 175 corporate employees in the sample. The analysis showed a statistically significant, moderate positive correlation between the two variables, $r(175) = .514, p < .001$.

In practical terms, this means employees who reported higher levels of perceived stress in their day-to-day working lives also tended to report higher levels of aggressive behaviour, whether that showed up as physical aggression, verbal aggression, anger, or hostility. A correlation of this size points to a relationship that is real but not complete. Perceived stress appears to be an important contributor to aggressive behaviour among the employees sampled here, but it is clearly not the only thing driving it, since a fair amount of variance in aggression is still left unexplained by stress alone.

Given how strong and significant this relationship turned out to be, the null hypothesis was rejected in favour of the

alternative hypothesis, confirming that aggressive behaviour and perceived stress are meaningfully connected among the corporate employees who took part in this study. This lines up with the theoretical expectations laid out earlier: both the General Aggression Model and the transactional theory of stress predict that higher stress appraisal should come with a greater chance of hostile or aggressive responses.

With 175 participants, the study had reasonable statistical power to detect a relationship of this size, which adds confidence that the correlation reflects a genuine pattern rather than a quirk of a small or unusual sample. That said, the correlational design means this finding should be read as evidence of association, not causation. It is entirely possible that stress drives aggression, that aggression feeds back into more perceived stress, or that both happen together in a kind of loop that a design like this cannot untangle. There is also something intuitively familiar about the finding: stress and behaviour rarely present themselves as neatly separate categories in everyday corporate life. A tense phone call or a missed deadline often colours the tone of every interaction that follows it. This result

gives that everyday impression firmer empirical footing, showing that a pattern many managers and employees already notice informally is detectable, with reasonable consistency, across 175 employees in real corporate settings.

It also helps to place this finding alongside the literature reviewed earlier. Studies grounded in healthcare and public-sector contexts, such as those by Attell et al. (2017) and Høgh et al. (2012), reported broadly similar patterns: exposure to hostile or stressful workplace conditions tends to go along with poorer psychological outcomes, even in occupational settings quite different from the corporate sector examined here. That consistency across such different settings strengthens the case that the stress–aggression link is not tied to any one industry but reflects something more general about how sustained occupational pressure affects behaviour. At the same time, this study adds to that literature by focusing specifically on a corporate sample, a population that, as noted earlier, has received comparatively little direct research attention compared with healthcare, hospitality, or public-sector employees.

Conclusion

This study set out to examine the relationship between aggressive behaviour and perceived stress among corporate employees, and the results support the idea that the two are significantly and positively related. Employees who experience more stress in their everyday working lives seem more likely to show aggressive behaviour, whether through irritability, sharper words, visible impatience, or more open hostility. None of this is especially surprising on reflection, but confirming it with data rather than simply assuming it gives the finding some practical weight.

These results have fairly direct implications for how organisations think about employee well-being. If unmanaged stress reliably spills over into interpersonal friction, then stress management probably should not be treated as a peripheral wellness initiative. It belongs closer to the centre of what keeps a workplace healthy and cooperative. Practical steps could include accessible counselling or employee assistance programmes, more realistic workload planning, training that helps employees notice and regulate stress-driven reactions before they turn into conflict, and a workplace culture where people feel able to raise difficulties before

those difficulties come out as irritability or confrontation.

The study has its limitations, and they are worth stating plainly. The sample of 175 was drawn using convenience sampling from corporate settings, which limits how confidently the findings can be generalised beyond that group. Relying on self-report measures brings in the possibility of social desirability bias, and the cross-sectional design means the direction of the relationship between stress and aggression cannot be pinned down with certainty. The study also did not account for other plausible influences, such as job satisfaction, organisational support, leadership style, or individual personality and coping style, any of which could shape how stress and aggression relate to each other.

Future research would benefit from larger and more varied samples, longitudinal designs that can track change over time, and additional variables that might mediate or moderate the stress–aggression relationship. It would also be useful to look more closely at protective factors, such as resilience, social support, or organisational culture, which earlier research suggests can soften the link

between stress and hostile behaviour, even if they cannot remove it entirely.

Even with these limitations, the present findings offer a reasonably solid, evidence-based starting point for organisations trying to build workplaces that are calmer and more genuinely supportive of the people in them. Treating employee stress as an early warning sign rather than a background inconvenience to be tolerated may be one of the more practical steps an organisation can take toward reducing everyday friction and sustaining healthier working relationships over time.

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4. Informed Consent:

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The data that support the findings of this study are available upon reasonable request from the corresponding author.

6. Author Contributions (Credit Statement):

☐ Author 1: Conceptualisation, Methodology, Writing – Original Draft

☐ Author 2: Data Curation, Formal Analysis, Writing – Review & Editing

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*Article***Neuroticism, Emotional Labour, And Faculty Burnout in Higher Education:
A Correlational Study***Article History*

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Abstract

The study investigated the relationships between trait neuroticism, emotional labor strategies (surface acting and deep acting), and the three dimensions of job burnout (emotional exhaustion, depersonalization, and personal accomplishment) among faculty members in higher education. Quantitative cross-sectional research design was employed to collect data from a sample of 50 university professors. Bivariate correlation techniques were employed in the data analysis to assess the statistical relationships between the variables. The empirical findings, theoretical implications for organizational psychology in academia, and distinct institutional patterns of faculty members' sense of professional efficacy are discussed. Finally, recommendations for future research, in particular shifting to broader, longitudinal, mixed-methods designs are presented.

Keywords: *neuroticism, emotional labour,
burnout, professors, higher education*

Introduction

Teaching has become one of the most stressful and demanding professions in recent decades, marked by constant change within higher education. Intense workload, long hours spent on lesson planning and grading, lack of institutional support, large class sizes, and low compensation compound the difficulties faced by educators.

Academia is increasingly recognized in public health and organizational psychology as a high-hazard environment for chronic stress: across 16 countries, more than 70% of faculty members reported moderate to very high psychological distress (Rahman et al., 2024).

Burnout is one of the major occupational health crises in higher education, arising from environmental and individual factors. Emotional labour is a documented job stressor for burnout (Jeung et al., 2018), and personality characteristics are linked to burnout dimensions (Salami, 2011). Lecturers report higher levels of emotional labour than employees in other occupations (Berry & Cassidy, 2013).

Burnout is systemic in modern higher education due to intense competition, privatization, and the dual demands of teaching and research. However, the

psychological mechanisms driving this strain remain poorly understood in non-Western academic environments.

Rationale

Global burnout research highlights distinct regional and cultural stressors, yet the literature largely neglects university faculty, who face unique dual demands in teaching and research. Although emotional labour and neuroticism are known individual predictors of burnout, their combined, interactive effects remain unexamined in higher education. This study evaluates an integrated triadic model of how neuroticism and emotional labour interact to drive burnout among Indian professors.

Purpose and significance

This study examines the relationship between burnout, emotional labour, and neuroticism among Indian university professors using a cross-sectional, pan-Indian methodology. It investigates how emotional demands, personality characteristics, and burnout correlate, offering a vulnerability model that explains why some professors burn out while others thrive under similar circumstances.

Review of literature

Burnout is most commonly understood through Maslach and Jackson's (1981)

three-dimensional model, that is, emotional exhaustion, depersonalization, and reduced personal accomplishment and, theoretically, through the Job Demands-Resources (JD-R) model (Demerouti et al., 2001), which frames burnout as an imbalance between demands requiring sustained effort and the resources available to meet them. Faculty burnout is well-documented globally and reaches particularly high levels in Indian samples (Singh & Soni, 2026; Tripathi, 2025), driven by workload, weak institutional support, and job insecurity rather than any single demographic factor.

Among personality traits, neuroticism shows the most consistent association with burnout, often explaining more variance than contextual job factors (Bianchi, 2018; Zhang et al., 2024). This is not simply a matter of neurotic individuals reacting more strongly to stressors: Hammen's stress generation hypothesis and Kammeyer-Mueller et al.'s (2013) findings suggest they actively generate stressful situations through their own behavioural and interpersonal patterns, producing elevated exhaustion regardless of baseline stress levels. This vulnerability may

be neurobiological rather than purely behavioural as neurotic individuals show altered amygdala-prefrontal connectivity, suggesting impaired top-down emotional control even when prefrontal regulatory regions are more active (Harenski et al., 2009; Silverman et al., 2019).

Among academics specifically, this translates into reduced classroom patience and lower student ratings (Tripathy, 2025; Maheshwari et al., 2019).

Hochschild (1983) distinguished surface acting (displaying unfelt emotions) from deep acting (actively inducing the required emotion). Surface acting is consistently costly because sustained suppression depletes self-regulatory resources (Yagil, 2011), whereas deep acting is more ambiguous and sometimes protective of wellbeing, sometimes itself resource-depleting through sustained effortful regulation (Tsang et al., 2021; Wang et al., 2019). Notably, university faculty report emotional labour levels exceeding those of frontline service workers, a pattern best explained not by classroom demands alone but by the marketized, service-oriented reframing of

higher education, in which students are increasingly positioned as consumers whose satisfaction faculty must manage (Constanti & Gibbs, 2004). This burden falls disproportionately on female faculty (Grace, 2021).

Conservation of Resources theory (Hobfoll, 1989), paired with the Job Demands - Resources model, suggests neuroticism functions as a personal vulnerability that depletes coping resources while emotional labour operates as a chronic job demand, with both converging on burnout through impaired emotional regulation (Gross, 1998). Personality has recently been reframed within COR theory as a "resource catalyst" (Russell & Halbesleben, 2026): neurotic individuals lack the buffering resources needed to stop stressors cascading into further loss, and surface acting appears to partially mediate the neuroticism-burnout link (Basim et al., 2013).

Previous studies have mostly concentrated on individualistic Western work cultures.

These results, however, may not be true in strongly collectivistic nations with distinct institutional hierarchies, like India, where professional boundaries and workplace dynamics are very different. The majority of

literature looks at typical corporate environments that are driven by profit. However, the academic sector operates under fundamentally distinct institutional objectives, tenure systems and performance criteria. Therefore, the stressors and productivity determinants of university faculty require a distinct examination. Even with relatively stable jobs, stress in public universities is caused by overcrowding, underfunding, and bureaucratic delays. High performance expectations, short-term contracts, and student-centric marketing pressures are common sources of stress in private institutions. These factors can make handling student complaints and the institution's reputation more emotionally taxing. In addition, Indian cultural norms like in-group obligations, and high regard hierarchy and authority can manifest as detrimental work ethic in which work is viewed as a moral and social obligation.

Moreover, most studies have been conducted in service industry workers such as hospitality staff, nurses, salesperson and school teachers. In contrast, research on university remains scarce and largely qualitative (Constanti & Gibbs, 2004; Dolgaleva, 2024; Heffernan & Bosetti, 2020; Ogbonna & Harris, 2004; Seymour, 2000;

Tripathi, 2025) and mixed-methods(Berry & Cassidy, 2013). Although these offer insightful descriptive insights, there is still a significant lack of empirical, quantitative data. The precise degree, direction, and predictability of the correlations between these variables cannot be completely verified without thorough statistical testing. A recent scoping review has highlighted the need for quantitative methods to study the impact of emotional labour among higher education teachers(Leutwiler et al., 2024). Furthermore, the results of recent studies are strongly biased in favor of industrialized Western economies. The data is geographically concentrated and therefore not generalizable.

Because of India's particular administrative hierarchies, legislative frameworks, and sociocultural norms, Western models cannot be assumed to apply solely to this region.

In summary, the intersection of these three distinct gaps reveals a significant gap in the literature which is the lack of empirical and statistically validated understanding of how these variables interact when applied to academic functioning within India's particular institutional environment. This multifaceted absence is directly addressed in

this thesis. This study goes beyond limited description to present statistically reliable findings that broadens the discipline's scope by utilizing a quantitative research design particularly suitable to this understudied population and region.

Hypothesis development

On the basis of the above theoretical and empirical discussion, the following hypotheses are proposed:

- H01a: Surface acting will not be significantly and positively related to emotional exhaustion and depersonalization.
- H01b: Surface acting will not be significantly and negatively related to personal accomplishment.
- H01c: Deep acting will not be significantly and negatively related to emotional exhaustion and depersonalization.
- H01d: Deep acting will not have a significantly positive relationship with personal accomplishment.
- H02a: There will be no significant positive relationship between neuroticism and emotional exhaustion among university professors.

- H02b: There will be no significant positive relationship between neuroticism and depersonalization among university professors.
- H02c: There will be no significant negative relationship between neuroticism and personal accomplishment.
- H03a: Neuroticism will not be significantly and positively related to surface acting.
- H03b: Neuroticism will not be significantly and negatively related to deep acting.

Methodology

This study used a quantitative, cross-sectional, correlational design to examine relationships between neuroticism, emotional labour, and burnout among professors, lecturers, and academicians at Indian universities and colleges, recruited via purposive and snowball sampling.

Inclusion criteria required current employment as an assistant professor, associate professor, professor, or lecturer with at least one year of experience; faculty with less than one year of experience or a clinically diagnosed mental health condition were excluded.

Burnout was measured using the 22-item Maslach Burnout Inventory-Educators Survey (MBI-ES; 7-point Likert scale; reliability .76 - .90, test-retest .62 - .80), assessing emotional exhaustion, depersonalization, and personal accomplishment. Emotional labour was measured using the 12-item Emotional Labor Scale (ELS), standardized for the Indian context (Gaan, 2011) a 5-point Likert scale ($\alpha > .75$), covering surface acting, deep acting, emotional display, and automatic regulation. Neuroticism was measured using the 12-item Neuroticism subscale of the NEO-FFI (5-point Likert scale; internal consistency .72 - .87, test-retest .79 - .91).

The survey was administered via Google Forms after institutional approval, circulated through WhatsApp, Instagram, and email, with informed consent obtained from all participants. Completion of the survey took 10-15 minutes and incomplete responses were excluded. The data were analysed in Jamovi using descriptive statistics and Pearson's correlation.

Results

The study had a sample of 50 faculties, who were evaluated for their levels of

neuroticism, emotional labour and burnout through self report questionnaires.

Table 1

Demographics of participants

		N	Percentage
Sex	Female	33	66%
	Male	17	34%
Type of institution	Public	9	18%
	Private	41	82%
Designation	Assistant professor	40	80%
	Associate professor	4	8%
	Professor	3	6%
	Lecturer	3	6%
Years of experience	Less than 5 years	14	28%
	5 – 10 years	16	32%
	More than 10 years	20	40%
PhD	Completed	15	30%
	Ongoing	10	20%
	No PhD	25	50%

Table 1 shows the count of the demographics such as sex, type of institution, designation, years of experience, PhD and its frequencies.

Table 2

Descriptive Statistics

Descriptive Statistics

	N	Mean	Standard deviation	Missing	Minimum	Maximum
Age	49	38.5	9.46	1	24	58

Table 2 shows the descriptive statistics for the faculties' age and years of experience. The sample size for age is 49 and years of experience is 50, with a mean age of $M = 38.50$ ($SD = 9.46$)

Table 3

Descriptive Statistics

	Neuroticism	Surface acting	Deep acting	Emotional exhaustion	Depersonalization	Personal accomplishment
N	50	50	50	50	50	50
Mean	22.3	8.96	10.3	19.0	5.32	32.9
Median	23.0	9.00	10.5	17.0	3.00	34.0
Standard deviation	6.37	2.32	2.30	11.8	6.02	7.79
Minimum	5	3	3	0	0	10
Maximum	36	13	15	53	28	47

Table 3 shows the descriptive statistics for all the observed constructs. The mean for neuroticism is $M = 22.3$ ($SD = 6.37$), surface acting is $M = 8.96$ ($SD = 2.32$), deep acting is $M = 10.3$ ($SD = 2.30$), emotional exhaustion is $M = 19.0$ ($SD = 11.8$), depersonalization is $M = 5.32$ ($SD = 6.02$) and personal accomplishment is $M = 32.9$ ($SD = 7.79$).

Table 4

Pearson's Correlation Between Neuroticism and Emotional Labour

		Surface acting	Deep acting
Neuroticism	Pearson's r	0.201	0.311*
	df	48	48
	p-value	.161	.028

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 4 shows the significance testing results for Pearson's correlation between neuroticism and emotional labour(surface

acting and deep acting). The findings indicate weak positive correlation between neuroticism and surface acting ($r = 0.201$, $p < .05$) however, this relationship was not statistically significant ($p = .161$). Because the p-value exceeded the alpha level of .05, failing to reject H03a. It also indicates a moderate positive correlation between neuroticism and deep acting ($r = 0.311$, $p < .05$), with a p-value of .028, which falls below the standard significance threshold ($p < .05$), hence rejecting rejecting H03b.

Table 5

Pearson's Correlation Between Neuroticism and Burnout

		Emotional exhaustion	Depersonalization	Personal accomplishment
Neuroticism	Pearson's r	0.570***	0.324 *	-0.039
	df	48	48	48
	p-value	<.001	.022	.787

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 5 shows significance testing results for Pearson's correlation between neuroticism and burnout. The findings indicate strong positive correlation between neuroticism and emotional exhaustion ($r = 0.570$, $p < .001$), denoting a statistically significant relationship ($p =$

$<.001$), rejecting H02a. There is a moderate positive correlation between neuroticism and depersonalization ($r = 0.324$, $p < .05$), which denotes a statistically significant relationship ($p =$

.022), rejecting H02b. There is no correlation between neuroticism and personal accomplishment (r

$= -0.039$, $p < .05$), indicating a statistically non-significant relationship ($p = .787$). Hence, failing to reject H02c.

Table 6

Pearson's Correlation Between Emotional Labour and Burnout

		Surface acting	Deep acting
Emotional exhaustion	Pearson's r	0.312*	0.324*
	df	48	48
	P-value	.027	.022
Depersonalization	Pearson's r	0.207	0.197
	df	48	48
	p-value	.149	.171
Personal accomplishment	Pearson's r	0.245	0.060
	df	48	48
	p-value	.087	.677

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 6 shows correlations between emotional labour and burnout. Surface acting was significantly related to emotional exhaustion ($r = 0.312$, $p < .05$) but not to depersonalization ($r = 0.207$, $p < .05$), rejecting H01a for exhaustion and failing to reject it for depersonalization; surface acting

was also not significantly related to personal accomplishment ($r = .245, p < .05$), failing to reject H01b. Deep acting was significantly related to emotional exhaustion ($r = 0.324, p < .05$) but not to depersonalization ($r = 0.197, p < .05$), rejecting H01c for emotional exhaustion and failing to reject it for depersonalization; deep acting was also not significantly related to personal accomplishment ($r = 0.060, p < .05$), failing to reject H01d.

Discussion

This study examined how neuroticism, emotional labour, and burnout relate among university faculty. Neuroticism showed a moderate positive correlation with deep acting but no significant relationship with surface acting, diverging from Austin et al. (2007), Diefendorff et al. (2004), and Kim (2008), and contrasting with Diefendorff et al. (2004) and Zhong et al. (2012), who found neuroticism negatively related to deep acting. Highly neurotic faculty may rely on cognitive reappraisal such as reshaping frustration into empathy rather than the superficial masking assumed by earlier frameworks (Diefendorff et al., 2004).

Neuroticism correlated strongly with emotional exhaustion and moderately with

depersonalization, consistent with Maslach's (2001) stress paradigm and prior research (Choi et al., 2025; Ghorpade et al., 2007; Kokkinos, 2006; Liu et al., 2022; Sadoughi, 2017); heightened exhaustion may drive depersonalization as a protective response. Neuroticism showed no relationship with personal accomplishment, supporting the multidimensional models of

Cano-Garcia et al. (2004), which treat personal accomplishment as cognitively grounded and independent of affective vulnerability.

Both surface and deep acting were moderately related to emotional exhaustion, consistent with Brotheridge and Grandey (2002), Goodwin et al. (2011), Lee (2017), Park et al. (2021), and Zhang et al. (2026) for surface acting. The deep acting result contradicts Brotheridge and Grandey (2002) and Lee (2017), who found no relationship, and Zhang et al. (2026), who found a negative relationship among university counselors which suggests that aligning internal states with institutional expectations is itself exhausting for faculty.

Neither surface nor deep acting significantly predicted depersonalization, indicating emotional labour drains resources without

directly fostering cynicism toward students. This contrasts with Brotheridge and Grandey (2002), Fischer (2019), and Lee (2017) on surface acting plausibly because Fischer's mental-health-provider sample depended on authentic connection in ways teaching does not. The null deep acting finding aligns with Brotheridge and Grandey (2002) but contradicts Lee (2017) and Tsang et al. (2021), who found deep acting reduced depersonalization among school teachers, supporting a sequential model where emotional labour depletes resources incrementally rather than triggering depersonalization directly.

Neither surface nor deep acting was significantly related to personal accomplishment, suggesting faculty ground their efficacy in research output and mentorship rather than emotional regulation style. This departs from Brotheridge and Grandey (2002), who found both positively related to personal accomplishment, and from Fischer (2019) and Lee (2017), who reported a negative link with surface acting and a positive link with deep acting, respectively. Where prior work frames deep acting as protective (Lee, 2017) or depleting (Tsang et al., 2021) for self-efficacy, the present findings suggest personal

accomplishment operates independently of emotional labour in this sample.

Conclusion

This study examined neuroticism, emotional labour, and burnout among university faculty. Contrary to prediction, neuroticism was unrelated to surface acting but positively related to deep acting, suggesting emotionally reactive professors rely on cognitive reappraisal rather than masking. Consistent with Maslach's (2001) stress paradigm and cross-cultural findings (Ghorpade et al., 2007; Salami, 2011b), neuroticism was linked to emotional exhaustion and depersonalization, with detachment likely functioning as a defense against further resource loss. Both surface and deep acting were related to emotional exhaustion, reflecting the cost of dissonance and over-regulation respectively. Neither emotional labour nor neuroticism was related to depersonalization or personal accomplishment, indicating that self-efficacy operates on a separate psychological pathway from affect and emotional regulation.

Implications

Theoretically, the study shows emotional regulation costs are shaped by occupational context, and that emotional labour does not

always determine burnout in high-status roles.

Practically, faculty burnout interventions should move beyond generic stress management to address neurotic faculty specifically, promote autonomy, and provide institutional recovery resources given the effort deep acting demands.

Limitations

The small sample size limits statistical power and generalizability. Demographic and cultural diversity, while valuable, introduces potential confounds around emotional expression norms. Reliance on self-report raises response-bias concerns, and the cross-sectional design cannot capture cultural display-rule effects or the gradual, cumulative nature of emotional exhaustion.

Recommendations for future research

Mixed-methods designs combined with longitudinal tracking would better capture how burnout develops over an academic year. Larger samples and experimental intervention studies are recommended. Given the low baseline personal accomplishment observed, future work should examine macro-institutional stressors like administrative load, research funding,

publication pressure as potential drivers of reduced professional efficacy.

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The data that support the findings of this study are available upon reasonable request from the corresponding author.

6. Author Contributions (Credit Statement):

☐ Author 1: Conceptualisation, Methodology, Writing – Original Draft

□ Author 2: Data Curation, Formal Analysis,
Writing – Review & Editing

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Article

Adolescents Perceptions of Parenting Styles and Desired Parental Behavioral Changes: A Qualitative Comparative Study Between North And South India

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<http://creativecommons.org/licenses/by/4.0>**Abstract:**

Parenting plays a central role in shaping adolescents' emotional, social, and psychological development. While numerous studies have examined parenting styles and their influence on adolescent outcomes, limited research has explored how adolescents themselves perceive parenting and the behavioural changes they desire from their parents, particularly within the Indian cultural context. The present qualitative comparative study explored adolescents' perceptions of parenting and desired parental behavioural changes among participants from North and South India. Semi-structured interviews were conducted with twelve adolescents (six from each region), and the data were analysed using Braun and Clarke's thematic analysis. The findings revealed that adolescents perceived parenting as a multidimensional experience characterised by varying levels of warmth, emotional availability, autonomy, discipline, communication, and parental expectations. Although participants from both regions described parental care and involvement,

notable regional differences emerged in emotional responsiveness, disciplinary practices, and autonomy granting. South Indian participants more frequently described conditional autonomy and limited emotional expression, whereas North Indian participants reported comparatively greater emotional support alongside concerns regarding parental expectations. Across both groups, adolescents consistently expressed a desire for increased emotional understanding, respectful communication, active listening, trust, appreciation, and validation. These findings highlight the importance of recognising adolescents' perspectives in strengthening parent-adolescent relationships and suggest the need for culturally sensitive parenting practices that balance guidance with emotional responsiveness.

Keywords:

Adolescents; Parenting; Parenting styles; Parent-adolescent relationship;

INTRODUCTION

Adolescence is a significant developmental stage marked by rapid physical, cognitive, emotional, and social changes that shape an individual's transition from childhood to adulthood. During this period, adolescents

strive to establish their identity, develop independence, and form meaningful interpersonal relationships while simultaneously navigating academic, social, and familial expectations. Although peers and educational environments become increasingly influential, the family remains the primary context within which adolescents learn emotional regulation, communication, values, and social behaviour. Consequently, the quality of parent-adolescent relationships plays a crucial role in promoting healthy psychological development and overall well-being.

Parenting extends beyond fulfilling children's physical needs and involves providing emotional support, guidance, discipline, communication, and opportunities for autonomy. The manner in which parents balance warmth, responsiveness, and behavioural control significantly shapes adolescents' emotional security and developmental outcomes. Parenting is therefore not merely a set of caregiving practices but a dynamic interaction between parents and children that evolves as children mature. As adolescents seek greater independence, maintaining a balance

between parental involvement and personal autonomy becomes increasingly important.

Research has consistently demonstrated that parenting styles influence various aspects of adolescent functioning, including self-esteem, emotional regulation, academic achievement, social competence, and psychological adjustment. Baumrind's classification of parenting styles authoritative, authoritarian, permissive, and neglectful-continues to provide a valuable framework for understanding parent-adolescent interactions. Among these, the authoritative parenting style, characterised by warmth, responsiveness, and appropriate behavioural expectations, has generally been associated with more favourable developmental outcomes. Conversely, authoritarian, neglectful, and, in certain contexts, permissive parenting styles have been linked to lower self-esteem, emotional distress, behavioural difficulties, and poorer psychosocial adjustment. However, contemporary research increasingly suggests that adolescents' own perceptions of parenting may be more influential than parents' intentions or self-reported parenting practices.

Adolescents do not merely experience parenting passively; they actively interpret parental behaviours based on their emotional needs, developmental stage, family relationships, and sociocultural environment. Consequently, two adolescents may perceive similar parental behaviours differently depending on their expectations and lived experiences. Understanding these subjective perceptions provides valuable insight into parent-adolescent relationships that cannot always be captured through standardised questionnaires or parental reports alone.

Qualitative research therefore offers an opportunity to explore adolescents' voices in greater depth by examining how they describe parenting in their own words and how these experiences influence their expectations of their parents.

Within the Indian context, parenting practices are deeply embedded in cultural values, family traditions, and social norms. Indian families often emphasise respect for elders, interdependence, academic achievement, and collective family responsibility. However, these cultural expectations are not uniform across the country. North and South India possess distinct historical, linguistic, and

sociocultural traditions that may influence parenting practices, emotional expression, disciplinary approaches, and the degree of autonomy granted to adolescents. While these regional variations are widely acknowledged, relatively few empirical studies have examined how adolescents themselves perceive these differences or how cultural contexts shape their expectations of parental behaviour.

Existing literature has extensively examined parenting styles and their relationship with adolescent adjustment, emotional well-being, self-concept, and academic functioning. Nevertheless, important gaps remain. Much of the available research within the Indian context has adopted quantitative methodologies using standardised scales and questionnaires, limiting opportunities for adolescents to express their lived experiences in their own voices.

Furthermore, studies comparing regional parenting practices within India remain limited, and comparatively little attention has been given to understanding the behavioural changes adolescents themselves wish to see in their parents. Rather than being viewed as active participants in shaping family relationships, adolescents have often been

treated primarily as recipients of parental influence.

The present study addresses these gaps by exploring adolescents' perceptions of parenting and the parental behavioural changes they desire through a qualitative comparative approach involving participants from North and South India. By foregrounding adolescents' experiences and interpretations, the study seeks to provide a deeper understanding of parent-adolescent relationships within diverse cultural contexts. The findings contribute to the growing body of literature on parenting by highlighting adolescents' perspectives as an essential component in promoting healthier communication, stronger family relationships, and culturally responsive parenting practices,

REVIEW OF LITERATURE

Research has consistently demonstrated that parenting plays a significant role in shaping adolescents' emotional, psychological, and social development. Parenting styles influence self-esteem, emotional regulation, academic performance, behavioural adjustment, and interpersonal relationships. Among the four major parenting styles,

authoritative parenting is generally associated with positive developmental outcomes, whereas authoritarian and neglectful parenting are often linked to poorer psychological adjustment and behavioural difficulties (Jaureguizar et al., 2018), Research has also suggested that parenting practices influence adolescents differently depending on cultural contexts, indicating that parenting cannot be understood independently of sociocultural influences (Indrianti et al., 2024).

Recent literature has increasingly emphasised that adolescents' perceptions of parenting are more influential than parents' own perceptions of their behaviour. A cross-cultural study conducted in Sweden, Italy, and Greece found that although most adolescents perceived their parents as authoritative, parenting practices differed across cultures, highlighting the role of societal influences in shaping parenting behaviours (Olivari et al., 2015). Similarly, Human et al. found that adolescents' perceptions of family routines and parenting predicted psychological adjustment more strongly than parents' perceptions, particularly when adolescents viewed their family environment more negatively (Human

et al., 2016). Supporting these findings, Janssen et al. reported that adolescents' perceptions of parental warmth and criticism had a greater impact on their emotional experiences than parents' self-evaluations, reinforcing the importance of examining parenting from adolescents' perspectives (Janssen et al., 2021).

Within the Indian context, several studies have demonstrated the positive influence of supportive parenting on adolescent development. Democratic and accepting parenting styles have been associated with higher self-concept among Indian adolescents, whereas autocratic parenting has shown negative effects (Kour & Rani, 2018). Similarly, research conducted in Assam reported that authoritative parenting was the most commonly perceived parenting style, reflecting a gradual transition towards more child-centred parenting practices in India (Begum et al., 2019). Research conducted in South India further revealed noticeable differences between adolescents' and parents' perceptions of parenting, particularly regarding disciplinary practices, despite agreement on parental involvement and rejection of corporal punishment (Prasad et al., 2024). Studies conducted in Delhi and

Chennai have likewise highlighted the positive relationship between parental warmth, communication, and adolescents' self-concept and self-esteem (Bhatia et al., 2022). (Kamal et al., 2026). (Yadav et al., 2024).

Research focusing on parenting within the Indian sociocultural context has also highlighted the influence of changing family structures and cultural values. Traditional authoritarian parenting has gradually shifted towards more authoritative and child-centred approaches, particularly among educated urban families (Sondhi, 2017). Mindful parenting has similarly been recognised as an approach that promotes adolescents' psychosocial development, resilience, and emotional well-being (Salotra, 2023). Furthermore, warm and affectionate parent-adolescent relationships have been identified as protective factors against behavioural and emotional difficulties among Indian adolescents (Chaudhary & Soral, 2023).

Despite the growing body of literature, important gaps remain. Most existing studies have adopted quantitative methodologies, relying on standardised questionnaires, thereby limiting opportunities to explore adolescents' lived experiences and subjective

interpretations of parenting. Furthermore, research comparing parenting perceptions across different cultural regions within India remains limited, with relatively little attention given to understanding the behavioural changes adolescents themselves wish to see in their parents. Existing studies have primarily focused on the effects of parenting styles rather than recognising adolescents as active interpreters of family relationships. Addressing these gaps, the present study adopts a qualitative comparative approach to explore adolescents' perceptions of parenting and the parental behavioural changes they desire among participants from North and South India.

METHODOLOGY

Research Design

The present study adopted a qualitative comparative research design to explore adolescents' perceptions of parenting and the parental behavioural changes they desired. A qualitative approach enabled an in-depth understanding of adolescents' lived experiences, while the comparative design facilitated the examination of similarities and differences between participants from North and South India.

Participants and Sampling

The study included 12 adolescents aged 15-19 years, comprising six participants from North India and six participants from South India. The participants were selected using purposive sampling, a non-probability sampling technique commonly employed in qualitative research to recruit individuals who possess relevant knowledge and experiences related to the research topic. This sampling method enabled the researcher to obtain rich and meaningful insights into adolescents' perceptions of parenting and the parental behavioural changes they desired.

To ensure comparability between the two regions, participants were selected based on predetermined inclusion criteria. Eligible participants were adolescents between 15 and 19 years of age who had been born and raised in either North or South India and were willing to participate in the study. Adolescents who did not meet the specified age criteria, were not primarily raised in either region, were unwilling to participate, or were experiencing acute psychological distress at the time of data collection were excluded from the study. The sample included participants from diverse educational and family backgrounds,

allowing for a broader understanding of adolescents' experiences while maintaining the depth of inquiry characteristic of qualitative research.

Data Collection

Data were collected through semi-structured interviews conducted in both online and offline settings. Before data collection, participants were informed about the purpose of the study, and informed consent or assent was obtained. Participation was voluntary, and confidentiality and anonymity were assured throughout the research process. Each interview lasted approximately 10-15 minutes and was conducted using a semi-structured interview schedule developed by the researcher. The interview focused on adolescents' perceptions of parenting styles, parent-adolescent relationships, and the parental behavioural changes they desired. Probing questions were used where necessary to encourage detailed responses. With participants' permission, all interviews were audio-recorded and later transcribed verbatim for analysis.

Data Analysis

The interview data were transcribed verbatim and analysed using Braun and Clarke's

(2006) thematic analysis. The transcripts were read repeatedly to achieve familiarity with the data, following which initial codes were generated from meaningful segments of participants' responses. Similar codes were then grouped into broader categories to identify recurring patterns and themes. The identified themes were reviewed, refined, and organised to accurately represent adolescents' perceptions of parenting styles and the parental behavioural changes they desired. The themes emerging from North Indian and South Indian adolescents were compared to identify similarities and differences in their perceptions and experiences.

Ethical Considerations

Ethical approval for the study was obtained from the concerned academic authorities before data collection. All participants were informed about the purpose and nature of the study before participation, and informed consent or assent was obtained. Participation was entirely voluntary, and participants were informed of their right to withdraw from the study at any stage without any consequences. Confidentiality and anonymity were maintained throughout the research process by protecting participants' identities and securely handling all collected data.

Interviews were audio-recorded only with participants' permission, and all transcripts were anonymised before analysis.

RESULTS

Based on participants' narratives, the findings of the present study were arranged thematically. Separate thematic analyses were conducted for North Indian and South Indian adolescents to facilitate a comparative understanding of perceived parenting styles across the two regions. Thematic analysis of the interview data revealed seven major themes: Parental Warmth and Emotional Responsiveness, Parental Control, Monitoring, and Restrictive Parental Expectations and Demandingness, Parental Support and Validation Practices, Autonomy Granting and Decision-Making Practices, Parental Disciplinary Practices, and Desired Parental Behaviour Changes. These themes reflect adolescents' perceptions and experiences of parenting styles and allow the identification of similarities and differences in parenting practices between North and South Indian families.

Table 1: presents the themes and subthemes identified among South Indian adolescents.

THEMES	SUB THEMES
<i>Parental warmth and emotional responsiveness</i>	Limited emotional expression Communication barriers Feeling misunderstood Inadequate emotional support Emotional withdrawal
<i>Parental control, monitoring, and restrictive practices</i>	Restrictions on mobility and social life Gender-based restrictions Conditional freedom
<i>Parental expectations and demandingness</i>	Academic expectations
	Pressure to conform to parental expectations Behavioural regulation through criticism
<i>Parental support and validation practices</i>	Appreciation through rewards Perceived support Lack of overt appreciation
<i>Autonomy granting and decision-making practices</i>	Lack of Autonomy and Restricted Decision-making Making Striving for independence
<i>Parental disciplinary practices</i>	Verbal scolding and criticism Harsh disciplinary practices Silent withdrawal
<i>Desired parental behaviour Changes</i>	Active, Non-Judgmental Listening Shift from Surveillance to Earned Trust Need for Positive Reinforcement & Identity Validation Refinement of Communication Tone

Table 2 presents the themes and subthemes identified among North Indian adolescents.

THEMES	SUB THEMES
<i>Parental warmth and emotional responsiveness</i>	Emotional closeness and affection Feeling unheard or misunderstood Hesitancy in emotional disclosure Parent-specific communication patterns
<i>Parental expectations and demandingness</i>	Academic achievement expectations

	Pressure to fulfil parental goals Expectations as a measure of success
<i>Parental control, monitoring, and restrictive practices</i>	Conditional Autonomy in Decision-Making Monitoring and overprotectiveness Gender-based restrictions Limited privacy and personal space
<i>Parental support and validation practices</i>	Emotional and instrumental support Appreciation on achievement Encouragement and reassurance Inconsistent validation and recognition
<i>Parental disciplinary practices</i>	Verbal criticism and scolding Repeated reminders of mistakes Silent treatment and emotional withdrawal
<i>Autonomy granting and decision-making practices</i>	Lack of Autonomy and Restricted Decision-making Making Assertion of personal preferences and individuality
<i>Desired parental behaviour Changes</i>	Shift from Authoritative Control to Supportive Guidance Demand for Empathic Listening & Emotional Validation Priority of Privacy over Surveillance

The thematic analysis generated seven major themes reflecting adolescents' perceptions of parenting styles and the parental behavioural changes they desired. Although participants from North and South India shared several experiences, differences were observed in

emotional expression, disciplinary practices, autonomy, and parental expectations. The themes are presented below.

Theme 1: Parental Warmth and Emotional Responsiveness

Participants from both regions acknowledged that their parents cared about their well-being and were concerned about their future. Expressions of parental warmth included providing guidance, meeting emotional and material needs, and offering support during difficult situations. However, North Indian participants generally described greater emotional closeness and open communication, whereas several South Indian participants reported that affection was often expressed indirectly through actions rather than verbal appreciation. Many adolescents expressed a desire for increased emotional availability, understanding, and validation from their parents.

Theme 2: Parental Control, Monitoring, and Restrictive Practices

Parental monitoring was commonly perceived as an expression of care and responsibility. However, many participants also described restrictions related to friendships, social activities, use of mobile

phones, and personal freedom. South Indian adolescents more frequently reported strict supervision and limited independence, while North Indian participants discussed concerns regarding overprotectiveness and privacy. Although most participants recognised the protective intentions behind these behaviours, they desired greater trust and age-appropriate independence.

Theme 3: Parental Expectations and Demandingness

Academic achievement emerged as the most prominent parental expectation across both groups. Participants described expectations related to educational success, responsible behaviour, and future career aspirations. While many adolescents appreciated their parents' concern for their future, excessive expectations often resulted in feelings of stress, pressure, and fear of disappointing their parents. Several participants emphasised the need for realistic expectations that considered their individual interests and capabilities.

Theme 4: Parental Support and Validation Practices

Participants reported receiving various forms of parental support, including academic

assistance, emotional encouragement, and practical guidance. Despite this, many adolescents felt that appreciation and recognition were often conditional upon academic success or achievements. Participants expressed a desire for more consistent encouragement, acknowledgement of their efforts, and positive reinforcement irrespective of outcomes, believing that such validation would strengthen their confidence and relationship with their parents.

Theme 5: Autonomy Granting and Decision-Making Practices

Most participants expressed the importance of being involved in decisions affecting their personal and academic lives. North Indian adolescents generally reported relatively greater opportunities to express their opinions, whereas South Indian participants more frequently described parental decision-making with limited adolescent involvement. Across both groups, participants viewed autonomy as an indicator of trust and maturity and wished for greater freedom to make age-appropriate decisions while continuing to receive parental guidance.

Theme 6: Parental Disciplinary Practices

Disciplinary practices reported by participants included verbal reprimands, restrictions, criticism, and occasional emotional withdrawal. South Indian participants more commonly perceived discipline as strict and rule-oriented, whereas North Indian participants described frequent criticism and reminders of mistakes. Although participants accepted discipline as an important aspect of parenting, they preferred approaches based on communication, explanation, and mutual understanding rather than punishment or excessive control.

Theme 7: Desired Parental Behavioural Changes

Across both regions, adolescents consistently expressed a desire for improvements in parent-child communication and emotional understanding. Participants wished their parents would listen without immediate judgement, communicate respectfully, appreciate their efforts, trust their decisions, and acknowledge their individuality. They also emphasised the importance of balancing guidance with autonomy, suggesting that stronger emotional support and open communication would contribute to healthier parent-adolescent relationships.

Discussion

The present study explored adolescents' perceptions of parenting styles and the parental behavioural changes they desired while comparing the experiences of adolescents from North and South India. The findings indicate that adolescents perceive parenting as a multidimensional process characterised by warmth, emotional responsiveness, control, autonomy, expectations, support, and disciplinary practices. Across both regions, participants described parenting as a combination of authoritative and authoritarian characteristics, although differences were observed in the degree of emotional expression, autonomy, and disciplinary practices. These findings support previous research suggesting that parenting is influenced by cultural and contextual factors and that adolescents' perceptions play a significant role in shaping parent-adolescent relationships (Olivari et al., 2015). (Sondhi, 2017).

A major finding of the study was the importance adolescents placed on emotional warmth, understanding, and supportive communication. Participants from both regions valued approachable parents, listened

without judgement, and provided emotional reassurance.

However, South Indian adolescents more frequently reported limited emotional expression, whereas North Indian participants described relatively greater emotional closeness while still expressing a need for increased validation. These findings are consistent with previous research demonstrating that parental warmth and supportive communication contribute positively to adolescents' emotional well-being, self-esteem, and psychosocial adjustment (Yadav et al., 2024). (Chaudhary & Soral, 2023).

The findings also highlighted adolescents' desire for greater autonomy and involvement in decision-making. Although participants recognised parental monitoring as an expression of care, many perceived excessive control and restrictions as barriers to independence. This was particularly evident among South Indian participants, who more frequently described conditional autonomy and stricter supervision. These findings align with earlier studies indicating that authoritative parenting, characterised by an appropriate balance of guidance and autonomy, is associated with healthier

psychological development, whereas excessive control may contribute to emotional distress and reduced self-esteem (Mandal et al., 2020). (Liu, 2024). (Kour & Rani, 2018).

Another significant finding was that adolescents across both regions desired behavioural changes that promoted mutual respect, trust, active listening, appreciation, and emotional validation. Rather than rejecting parental authority, participants expressed a preference for parenting practices that balanced guidance with empathy and open communication. This supports the growing emphasis on adolescent agency in parenting research, highlighting that adolescents should be viewed as active contributors to family relationships rather than passive recipients of parental behaviour (Prasad et al., 2024). (Begum et al., 2022). The present study extends existing literature by qualitatively examining adolescents' expectations of parental behavioural change while comparing experiences across North and South India, thereby providing insight into how regional cultural contexts shape parent-adolescent relationships.

Overall, the findings suggest that while parenting practices differ across cultural

contexts, adolescents share common developmental needs for emotional support, respectful communication, trust, and age-appropriate autonomy. By foregrounding adolescents' perspectives, the study contributes to a deeper understanding of parenting within the Indian context and highlights the importance of adopting culturally sensitive and relationship-oriented parenting practices that strengthen parent-adolescent relationships.

Practical Implications

The findings of the present study have important implications for parents, educators, counsellors, and mental health professionals working with adolescents. The study highlights the importance of fostering warm, supportive, and respectful parent-adolescent relationships through open communication, active listening, and emotional validation. Parents may benefit from adopting parenting practices that balance guidance and discipline with trust, empathy, and age-appropriate autonomy, thereby promoting adolescents' emotional well-being and healthy psychosocial development.

The findings also suggest that schools and counselling professionals can play an

important role in strengthening parent-adolescent relationships by organising parent education programmes, family counselling sessions, and awareness initiatives that encourage positive communication and mutual understanding. Furthermore, recognising regional and cultural differences in parenting practices can assist practitioners in developing culturally sensitive interventions that address the unique needs and expectations of adolescents from diverse backgrounds. Overall, the study emphasises the value of incorporating adolescents' perspectives into parenting practices to foster healthier family relationships and positive developmental outcomes.

Limitations

The present study has certain limitations that should be considered while interpreting the findings. First, the study was conducted with a small sample of 12 adolescents, which limits the transferability of the findings to the broader adolescent population in India. Second, the use of purposive sampling may have introduced selection bias, as participants were selected based on specific inclusion criteria. Third, the study relied solely on adolescents' perspectives, without including parents' views, which could have

provided a more comprehensive understanding of parent-adolescent relationships. Finally, the qualitative nature of the study focused on obtaining in-depth insights rather than producing findings that can be statistically generalised. Future research may include larger and more diverse samples, adopt mixed- method approaches, and incorporate the perspectives of both adolescents and parents to provide a more holistic understanding of parenting practices across different cultural contexts.

Conclusion

The present study explored adolescents' perceptions of parenting styles and the parental behavioural changes they desired through a qualitative comparison of participants from North and South India. The findings revealed that adolescents viewed parenting as a multidimensional experience shaped by emotional warmth, communication, parental expectations, disciplinary practices, autonomy, and support. Although participants from both regions shared several common experiences, notable differences were observed in emotional expression, parental control, and opportunities for independent decision-

making, reflecting the influence of regional and cultural contexts.

Across both groups, adolescents consistently expressed a desire for greater emotional understanding, active listening, trust, appreciation, respectful communication, and age-appropriate autonomy. Rather than rejecting parental guidance, participants emphasised the importance of balancing discipline with empathy, support, and mutual respect. These findings reinforce the value of understanding parenting from adolescents' perspectives and highlight the importance of fostering positive parent-adolescent relationships through open communication and emotional responsiveness.

By providing qualitative insights into adolescents' lived experiences, this study contributes to the growing body of literature on parenting within the Indian context and addresses the limited research comparing adolescents' perceptions across North and South India. The findings underscore the need for culturally sensitive parenting practices that recognise adolescents as active participants in family relationships. Future research involving larger and more diverse samples, along with the inclusion of parents' perspectives, may further enhance the

understanding of parenting practices and their influence on adolescent development.

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3. Ethics Approval:

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4. Informed Consent:

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The data that support the findings of this study are available upon reasonable request from the corresponding author.

6. Author Contributions (Credit Statement):

☐ Author 1: Conceptualisation, Methodology, Writing – Original Draft

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Article

Immediate Effects Of Brief Social Media Scrolling Versus Mindfulness Meditation On Psychological Distress Among

Article History

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Abstract

Social media and mobile phones have become essential components of our daily lives. Although modern technologies provide entertainment and convenience, excessive usage can have detrimental effects on one's physical, emotional, and mental health. Social media's growing prevalence in daily life has raised concerns about its impact on psychological well-being, specifically among young adults. High levels of stress, anxiety, and emotional distress have been linked to frequent usage of social media. Simultaneously, mindfulness-based techniques have been shown to improve emotional regulation and psychological well-being. The aim of the present study is to examine whether a brief mindfulness meditation session following social media scrolling can reduce psychological distress in college students or not. An experimental research design was employed with college students as participants. All participants

initially engaged in ten minutes of social media scrolling to simulate typical digital engagement. Following this, the experimental group participated in a ten-minute guided mindfulness meditation session focusing on breathing and present-moment awareness, while the control group did not receive any intervention. After the activity, participants in both groups completed the Depression Anxiety Stress Scales (DASS-21) to assess levels of psychological distress. Data was analysed using an independent sample t-test to compare the levels of depression, anxiety, and stress between the experimental and control groups. The results were not statistically significant.

Keywords:

social media, mindfulness meditation, psychological well-being, DASS-21, psychological distress

Introduction

The rapid expansion of digital technology has significantly transformed patterns of communication, information consumption, and daily functioning, particularly among young adults. College students represent one of the most active user groups of smartphones

and social media platforms, frequently engaging with digital content for extended periods throughout the day (Keles et al., 2020). While these platforms provide opportunities for social interaction, entertainment, and access to information, growing concerns have emerged regarding their potential impact on psychological well-being. A growing body of empirical research suggests that excessive and unregulated social media use is associated with negative mental health outcomes (Primack et al., 2017; Lin et al., 2016). Studies have demonstrated that increased screen time and passive consumption of online content are linked to higher levels of stress, anxiety, and depressive symptoms (Twenge et al., 2018; Lin et al., 2016). Continuous exposure to large volumes of information may contribute to cognitive overload and emotional dysregulation, thereby negatively affecting psychological functioning (Mark et al., 2018). In particular, unstructured and prolonged engagement with social media platforms has been associated with maladaptive cognitive processes such as social comparison and negative self-evaluation, which can further lead to

emotional distress (Vogel et al., 2014; Verduyn et al., 2017).

One specific behavioural pattern that has gained attention in recent years is “doom scrolling,” defined as the repetitive consumption of negative or distressing online content. This behaviour has been associated with heightened rumination, worry, and emotional exhaustion. Exposure to negative digital content has been shown to increase negative affect and stress responses, thereby reinforcing maladaptive emotional cycles (Yang Y et al., 2023). Such patterns are particularly concerning among college students, who are frequently exposed to algorithm-driven content that prioritizes emotionally salient information. In contrast to the adverse effects associated with excessive digital engagement, mindfulness-based interventions have been widely recognized as effective approaches for enhancing psychological well-being. Mindfulness refers to the intentional, present-moment awareness of one’s thoughts, feelings, and bodily sensations in a non-judgmental manner. Research indicates that mindfulness-based practices can reduce anxiety, depression, and stress by improving emotional regulation and decreasing

rumination (Khouri et al., 2013; Hoge et al., 2013). Meta-analytic evidence further supports the effectiveness of mindfulness-based interventions in reducing symptoms of anxiety and depression across diverse populations. (Hofmann et al., 2010)

Importantly, recent research suggests that even brief mindfulness interventions can produce immediate psychological benefits. Experimental studies have demonstrated that short-duration mindfulness practices can reduce negative affect and improve emotional responses following exposure to distressing stimuli. These findings highlight the potential of brief, accessible interventions in real-world contexts, particularly for populations with limited time and high digital engagement.

Despite the growing literature on both social media use and mindfulness interventions, most existing studies have focused on long-term associations or correlational designs. There remains a lack of experimental research examining the immediate psychological effects of social media exposure and the potential buffering role of brief mindfulness practices in real-time contexts. Furthermore, limited research has specifically explored these dynamics among

college students in controlled experimental settings. Therefore, the present study aims to examine the effect of a brief mindfulness meditation following social media scrolling on psychological distress among college students. By focusing on immediate outcomes, this study seeks to contribute to the emerging field of digital well-being and provide practical insights into simple interventions that can mitigate the psychological impact of everyday digital engagement.

Review Of Literature

The relationship between social media use and psychological well-being has been widely examined in contemporary research, particularly among young adults. Several studies have identified a positive association between excessive social media use and increased levels of psychological distress. For instance, Ethan Kross et al. (2013) found that increased Facebook use predicted declines in subjective well-being over time, suggesting that frequent engagement with social networking platforms may negatively impact emotional health. Similarly, Melissa G. Hunt et al. (2018) demonstrated that limiting social media use significantly reduced loneliness and symptoms of

depression, highlighting the potential mental health risks associated with prolonged digital engagement.

A key mechanism underlying these effects is passive consumption of content, particularly through scrolling behaviours. Passive use of social media has been associated with increased social comparison, which can lead to negative self-evaluation and reduced self-esteem. Research by Hanna Krasnova et al. (2013) indicated that passive following of others on social media can evoke feelings of envy, thereby contributing to decreased life satisfaction. Furthermore, exposure to emotionally negative content has been shown to amplify stress responses and negative affect, reinforcing maladaptive emotional patterns (Garfin, Silver, & Holman, 2020).

In recent years, the phenomenon of doom scrolling has gained attention as a distinct pattern of problematic digital behaviour. Doom scrolling involves the repetitive consumption of negative or distressing news, often driven by uncertainty and the need for information. Studies have suggested that such behaviour is associated with increased anxiety, rumination, and emotional exhaustion (Price et al., 2022). Continuous exposure to negative information may

activate stress-related cognitive processes, thereby intensifying psychological distress and reducing emotional resilience.

In contrast to these negative outcomes, mindfulness-based interventions have been widely recognized for their effectiveness in improving mental health. Mindfulness practices promote present-moment awareness and non-judgmental acceptance of experiences, which can reduce rumination and enhance emotional regulation. A meta-analysis by Stefan G. Hofmann et al. (2010) found that mindfulness-based therapy is effective in reducing symptoms of anxiety and depression across clinical and non-clinical populations. Similarly, Khoury et al. (2013) reported that mindfulness-based interventions produce moderate to large effects in reducing psychological distress.

Specific to college populations, mindfulness has been shown to reduce problematic smartphone use and associated distress. Research by Greg Feldman et al. (2023) demonstrated that a brief breath-focused mindfulness exercise led to improvements in emotional regulation and physiological responses when compared to unstructured smartphone use. These findings suggest that

even short-duration interventions can have meaningful psychological benefits.

Despite the substantial evidence linking social media use to psychological distress and mindfulness to improved well-being, there remains a lack of experimental studies examining their interaction in immediate contexts. Much of the existing literature focuses on long-term outcomes or correlational relationships, limiting the ability to draw causal inferences. In particular, few studies have investigated whether brief mindfulness interventions can effectively reduce the immediate psychological impact of social media scrolling within a controlled setting.

The present study addresses this gap by experimentally examining the effect of a short mindfulness meditation following social media exposure on psychological distress among college students. By focusing on immediate outcomes, this research contributes to the understanding of how simple, time-efficient interventions can support psychological well-being in an increasingly digital world.

Methodology

Aim: The aim is to examine whether a brief mindfulness meditation session following social media scrolling can reduce psychological distress in college students or not.

Hypothesis:

1. Null Hypothesis (H_0): There will be no significant difference in levels of depression, anxiety, and stress between participants who engage in mindfulness meditation after social media scrolling and those who do not.

- **Research Design:** A between-group design was used to examine the effect of a brief mindfulness intervention on psychological distress following social media exposure. Participants were randomly assigned to one of two groups-

1. **Experimental group (n = 30)**
2. **Control group (n = 30)**

- **Variables:**

1. **Independent Variable:** Mindfulness meditation

2. **Dependent Variable:** Levels of psychological distress, operationalized as Depression, Anxiety, and Stress.

- **Sampling:** The study involved 60 undergraduate and postgraduate students selected through convenience sampling within the age range of 18-25 years.

- **Inclusion Criteria:**

1. Individuals who range between 18-25 years.
2. Individuals who engage in social media regularly.
3. Participants who can understand and comprehend English.

- **Exclusion Criteria:**

1. Individuals with a diagnosis of severe psychiatric disorder.
2. Participants currently undergoing therapy or counselling.
3. Participants who do not actively engage in social media.

- **Tool Used:** Psychological distress was assessed using the Depression Anxiety Stress Scales (DASS-21)

developed by Syd Lovibond and Peter Lovibond (1995). The DASS-21 is a self-report instrument consisting of 21 items, divided into three subscales, namely Depression, Anxiety, and Stress. Participants rate each item on a 4-point Likert scale ranging from 0 (“Did not apply to me at all”) to 3 (“Applied to me very much or most of the time”). The scale has demonstrated good reliability and validity across both clinical and non-clinical populations.

Procedure

The study was conducted in a controlled environment to minimize external distractions. Participants were first briefed about the general purpose of the study and provided informed consent.

Step 1: Social Media Exposure: All participants were initially asked to engage in 10 minutes of social media scrolling. This was done to simulate typical digital engagement behaviour. Participants were instructed to scroll passively without actively interacting (e.g., commenting or messaging).

Step 2: Group Allocation and

Intervention: Following the scrolling phase, participants were randomly assigned to an experimental group, which underwent a 10-minute guided mindfulness meditation session. The meditation focused on breath awareness, encouraging participants to observe their thoughts and bodily sensations without judgment. Followed by control group that did not receive any intervention and remained seated quietly for the same duration. Immediately after the intervention phase, all participants completed the **DASS-21** questionnaire to assess their levels of depression, anxiety, and stress.

- **Ethical Considerations:**

Ethical guidelines were strictly followed throughout the study. Participation was voluntary, and informed consent was obtained before data collection. Participants were assured of confidentiality and anonymity. They were also informed of their right to withdraw from the study at any point without penalty. No harmful or distressing stimuli were used, and the mindfulness intervention posed no psychological risk to participants.

Data Analysis:

An Independent Sample T-Test was conducted using Jamovi software to compare the mean scores between the two groups.

- **Results:**

An Independent Sample T- Test was conducted to evaluate whether participants who underwent intervention obtained lower distress scores compared to those who did not follow through with the intervention.

Descriptive statistics indicated that the experimental group ($n = 30$) had a mean score of 24.1 ($SD = 20.1$), while the control group ($n = 30$) had a higher mean score of 32.9 ($SD = 21.7$). The results of the t-test showed that the difference between the two groups was not statistically significant, $t(58) = -1.63$, $p = 0.109 > 0.05$. Thus, the null hypothesis was retained, indicating that there is no statistically significant difference in psychological distress between the two groups.

Discussion

The present study aimed to examine the immediate effects of brief mindfulness meditation following social media scrolling on psychological distress among college students. Although the experimental group

reported lower mean distress scores compared to the control group, the difference was not statistically significant. This suggests that while mindfulness meditation may have a potentially beneficial effect, the impact of a single brief session may not be strong enough to produce significant changes in psychological distress. The findings partially align with previous research that highlights the effectiveness of mindfulness; however, such benefits are often observed with longer or repeated interventions rather than short-term exposure.

Conclusion

This study examined the immediate effects of brief mindfulness meditation following social media scrolling on psychological distress among college students. Although the experimental group showed lower levels of distress compared to the control group, the difference was not statistically significant. These findings suggest that while mindfulness may have a positive influence, a single short session may not be sufficient to produce measurable changes. Further research with longer and repeated interventions is needed to better understand its effectiveness.

Limitations

There are several limitations that must be considered while interpreting the findings. Relatively small sample size limits the generalizability of the results to a broader population. Additionally, the use of a single, brief 10-minute mindfulness intervention may not have been sufficient to produce significant changes in psychological distress. The study employed convenience sampling, which may introduce bias and affect the representativeness of the sample. Data were collected using self-report measures (DASS-21), which are subject to social desirability and response biases. Furthermore, external variables such as participants prior emotional state, type of social media content viewed, and individual differences were not controlled. The absence of a long-term follow-up also restricts understanding of the sustained effects of the intervention and participant engagement with the mindfulness exercise.

Implications

The findings of the study suggest that brief mindfulness meditation may have potential as a simple and accessible strategy

for managing psychological distress among college students, even though the results were not statistically significant. It highlights the importance of promoting mindful practices as part of student well-being and encourages educational institutions to incorporate short mental health interventions into daily routines. Additionally, the study provides a foundation for future research to explore the effectiveness of mindfulness with larger samples, longer durations, and repeated sessions to better understand its impact.

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3. Ethics Approval:

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5. Data Availability Statement:

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6. Author Contributions (Credit Statement):

☐ Author 1: Conceptualisation, Methodology, Writing – Original Draft

☐ Author 2: Data Curation, Formal Analysis, Writing – Review & Editing

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Annexure 1

Tables and figures

Results

Independent Samples T-Test

Independent Samples T-Test			
	Statistic	df	p
B Student's t	-1.63	58.0	0.109

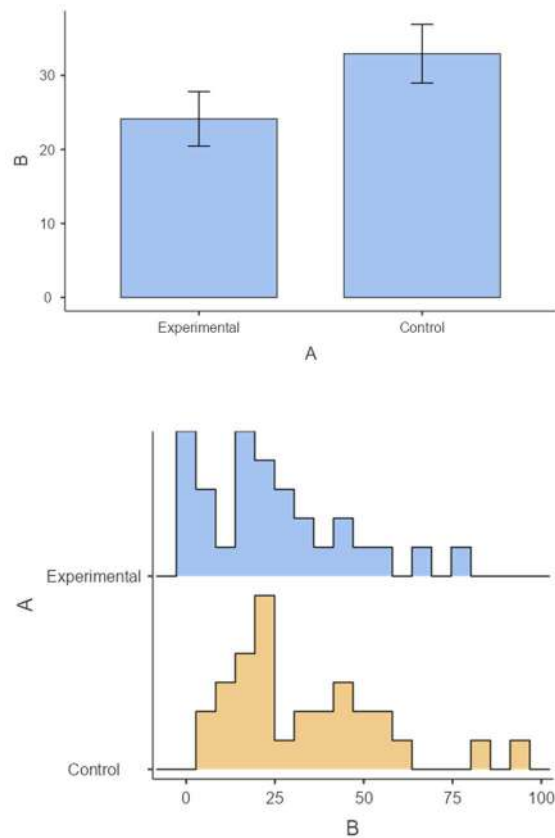
Note: H₀: μ Experimental = μ Control

Group Descriptives

Group	N	Mean	Median	SD	SE
B Experimental	30	24.1	20.0	20.1	3.68
B Control	30	32.9	25.0	21.7	3.97

Plots

B



Annexure-2

DASS21

Depression V P S

Order: 01 03 20

Please read each statement carefully, and mark as 0, 1, 2 or 3 where indicated. If you made the statement **often** or **very often**, under the given value. There are no right or wrong answers. Do not spend too much time thinking about each item.

The table marks are as follows:

No.	Statement	0	1	2	3
01	Feeling sad, or even alone				
02	Feeling sorry for yourself				
03	Feeling that you are a failure				
04	Feeling that you are a failure				
05	Feeling that you are a failure				
06	Feeling that you are a failure				
07	Feeling that you are a failure				
08	Feeling that you are a failure				
09	Feeling that you are a failure				
10	Feeling that you are a failure				
11	Feeling that you are a failure				
12	Feeling that you are a failure				
13	Feeling that you are a failure				
14	Feeling that you are a failure				
15	Feeling that you are a failure				
16	Feeling that you are a failure				
17	Feeling that you are a failure				
18	Feeling that you are a failure				
19	Feeling that you are a failure				
20	Feeling that you are a failure				

Article

Impact of Digital Classroom Learning on Attention and Executive Function in Indian School Students

Article History

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Abstract

Background of the Study: The integration of digital technologies such as smart boards, tablets, and online learning platforms has significantly transformed educational environments worldwide, including in India. Digital classrooms aim to enhance engagement, accessibility, and interactive learning. However, concerns have emerged regarding the cognitive implications of prolonged digital exposure in school-aged children, particularly in relation to attention and executive functioning. Attention and executive functions—including working memory, inhibitory control, and cognitive flexibility—play a critical role in academic learning, problem-solving, and self-regulation. Given the increasing dependence on technology in education, it is important to examine how digital classroom learning may influence these cognitive processes among students.

Methods: This study employed a narrative review methodology with thematic synthesis. Relevant peer-reviewed literature was identified through academic databases including Google Scholar, PubMed, and Scopus. Studies examining digital learning environments, screen-based education, attention, and executive functioning in school-aged children were included. Selected articles were analyzed qualitatively, and key patterns were identified through thematic synthesis to understand the cognitive impacts of digital classroom exposure.

Results: The thematic synthesis revealed three key themes: (1) enhanced engagement and cognitive flexibility through interactive and multimedia learning tools; (2) variability in sustained attention, with some studies reporting attentional fragmentation due to frequent digital stimuli; and (3) mixed effects on executive functions, where digital tools may support working memory and problem-solving but may also challenge inhibitory control in highly stimulating environments.

Discussion and Conclusion: The findings suggest that digital classroom learning presents both opportunities and challenges for students' cognitive functioning. While interactive technologies may support

engagement and cognitive flexibility, excessive or poorly structured digital exposure may affect sustained attention. Balanced and pedagogically guided integration of digital tools is therefore essential for optimizing cognitive development.

Keywords: *Digital classrooms; Attention; Executive functioning; School students; Cognitive development*

1. Introduction

The rapid integration of digital technologies into contemporary educational systems has substantially transformed traditional pedagogical practices across the globe. Modern classrooms increasingly incorporate technologically mediated instructional tools such as digital boards, multimedia platforms, electronic textbooks, and learning management systems, enabling interactive and multimodal learning experiences (Selwyn, 2016). These developments have reshaped the structure of knowledge delivery, expanding access to educational resources while facilitating new modes of student engagement and collaborative learning.

In the Indian educational landscape, the adoption of digital learning has accelerated

markedly over the past decade. National policy initiatives aimed at strengthening digital infrastructure and improving technological accessibility have contributed to widespread implementation of digital learning platforms across schools. The transition toward technology-mediated instruction was further intensified during the COVID-19 Pandemic, which prompted large-scale shifts toward online and hybrid learning models to maintain educational continuity (Kapasias et al., 2020). As a result, many students now experience prolonged exposure to screen-based learning environments that involve continuous interaction with digital interfaces, multimedia content, and virtual communication platforms.

Digital classroom environments provide several pedagogical advantages. Interactive learning platforms can enhance student engagement, provide immediate feedback, and facilitate access to diverse informational resources. Multimedia instructional tools also allow integration of visual, auditory, and interactive elements that may enhance perceptual processing and conceptual understanding. From a cognitive perspective, such environments may stimulate attentional

engagement and promote active learning by presenting information through dynamic multimodal channels.

However, the increasing reliance on screen-based learning has also raised important concerns regarding its potential neurocognitive implications, particularly for children and adolescents whose brains are still undergoing critical developmental changes. Prolonged exposure to digital stimuli, rapid information streams, and frequent task-switching demands may influence attentional regulation, cognitive load management, and executive functioning processes that are essential for effective learning.

Executive functions constitute a set of higher-order cognitive processes that enable individuals to regulate behavior, maintain goal-directed activity, and adapt flexibly to changing task demands. These processes include working memory, inhibitory control, cognitive flexibility, planning, and monitoring, which are largely mediated by the prefrontal cortex and its distributed neural networks involving frontoparietal and cortico-subcortical pathways (Diamond, 2013). The Prefrontal Cortex plays a central role in coordinating complex cognitive

operations such as maintaining task goals, suppressing irrelevant information, allocating attentional resources, and regulating behavioral responses in dynamic environments.

Attention itself represents a multidimensional neurocognitive construct involving several interacting subsystems, including selective attention, sustained attention, divided attention, and executive attention. These attentional processes are supported by distinct yet interconnected neural networks such as the dorsal attention network, ventral attention network, and executive control network. Efficient functioning of these systems is critical for classroom learning, as attentional control enables students to encode information effectively, maintain task-relevant representations in working memory, and resist interference from distracting stimuli.

Importantly, childhood and adolescence represent periods of significant neurodevelopmental maturation. Neurodevelopmental research indicates that executive control systems continue to develop throughout adolescence, driven by processes such as synaptic pruning, myelination, and strengthening of

connectivity within frontoparietal neural circuits (Casey, Jones, & Hare, 2008). Environmental factors—including educational experiences and digital media exposure—may influence the efficiency and developmental trajectory of these cognitive systems.

Digital learning environments often present highly stimulating informational contexts characterized by multimedia elements, rapid stimulus transitions, and continuous streams of sensory input. While these features may enhance engagement and perceptual salience, they may also increase cognitive load and place substantial demands on attentional control mechanisms. Frequent exposure to interactive digital stimuli may influence attentional allocation, inhibitory control over distractions, and working memory updating processes during learning tasks (Anderson & Subrahmanyam, 2017).

Empirical research examining the cognitive effects of screen exposure among children has produced mixed findings. Some studies suggest that certain forms of digital interaction may enhance visuospatial processing and cognitive flexibility, particularly when tasks require rapid stimulus discrimination and adaptive responses

(Green & Bavelier, 2012). Conversely, excessive or unstructured screen exposure has been associated with difficulties in sustained attentional engagement, increased distractibility, and fragmented patterns of cognitive focus (Christakis, 2019).

A systematic review conducted by Stiglic and Viner (2019) reported associations between higher levels of screen time and a range of adverse cognitive and behavioral outcomes among children and adolescents, including attentional dysregulation, increased impulsivity, and reduced psychological well-being. These findings underscore the complex and context-dependent nature of digital media exposure and its potential influence on neurocognitive development.

Despite the rapid expansion of digital learning initiatives within Indian schools, relatively limited research has synthesized existing evidence regarding the neuropsychological implications of digital classroom environments for attentional regulation and executive functioning. Understanding how technology-mediated learning interacts with developing cognitive systems is therefore essential for informing educational policies, optimizing pedagogical

strategies, and promoting cognitively supportive learning environments.

The present study aims to examine the neurocognitive implications of digital classroom learning on attentional processes and executive functioning among school students through a narrative review and thematic synthesis of existing literature.

2. Methods

This study employed a narrative review methodology combined with thematic synthesis to examine the cognitive implications of digital classroom learning.

Relevant peer-reviewed literature was identified using academic databases including Google Scholar, PubMed, and Scopus. Search terms included combinations of keywords such as *digital classroom*, *screen-based learning*, *educational technology*, *attention*, *executive function*, *working memory*, and *school children*.

Studies were included based on the following criteria:

1. Research examining digital or screen-based learning environments
2. Studies involving school-aged children or adolescents

3. Investigations focusing on attention, working memory, inhibitory control, or executive functioning
4. Articles published in peer-reviewed journals

After screening relevant studies, the selected literature was analyzed qualitatively. A thematic synthesis approach was used to identify recurring patterns related to the cognitive effects of digital classroom exposure.

Result

Theme	Digital Learning Context	Cognitive / Educational Domain	Key Findings	Implications for Students	Supporting Literature
Increased Classroom Engagement	Smart classrooms & multimedia tools	Learning engagement & attentional orientation	Multimedia tools significantly boost participation and visual interest.	Interactive tech enhances attention when integrated with pedagogy.	GOI (2020); NCERT (2021)
Increased Screen Exposure	Post-COVID adoption of online platforms	Sustained attention & concentration	Prolonged screen time is linked to reduced concentration levels in some students.	Requires structured schedules to mitigate "zoom fatigue."	Kapasia et al. (2020)
Blended Learning Models	Hybrid digital/physical classroom setups	Cognitive engagement & flexibility	Blended approaches support flexible learning and deeper involvement.	Hybrid models foster more adaptive, resilient learning strategies.	Mishra, Gupta, & Shree (2020)
The Digital Divide	Unequal access to devices/internet	Educational access & attentional resources	Rural and low-income students face severe barriers to digital access.	Infrastructure is the primary prerequisite for equitable cognition.	GOI (2020); UNESCO (2021)
Cognitive Fatigue	Prolonged online classes & continuous screen-based learning	Mental fatigue & sustained attention	Extended digital sessions decrease attentional endurance over time.	Mandatory offline breaks are essential for cognitive recovery.	Kapasia et al. (2020)

<i>Teacher-Mediated Instruction</i>	Teacher-guided use of digital platforms	Task focus & attentional control	Student engagement improves when teachers actively mediate tech use.	Teacher training in digital pedagogy is a critical success factor.	NCERT (2021)
<i>Self-Regulation & Autonomy</i>	Independent learning via digital apps	Executive functioning & self-regulation	Students must learn to manage digital distractions independently.	Digital literacy must include training in self-regulatory skills.	Mishra et al. (2020)

<i>Technological Adaptation</i>	Classroom exposure to interactive tools	Cognitive flexibility & adaptation	Students show high levels of gradual adaptation to new learning formats.	Digital literacy is becoming a core component of cognitive flexibility.	NCERT (2021)
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<i>Pandemic-Driven Transformation</i>	Rapid shift to digital-only education	Learning continuity & adjustment	Digital systems ensured continuity but required massive cognitive adjustment.	Post-pandemic systems are now permanently hybridized.	UNESCO (2021)
<i>Policy-Driven Initiatives</i>	National programs (e.g., DIKSHA)	Educational access & engagement	Large-scale government initiatives are scaling digital infrastructure.	Sustainable implementation relies on continued policy support.	GOI (2020); NCERT (2021)

Table: Thematic Synthesis: Digital Learning & Cognitive Outcomes in Indian Schools

The digital classroom exposure influences several neurocognitive domains associated with learning, particularly attentional regulation, working memory capacity, inhibitory control, and cognitive load management. Across the reviewed literature, digital learning environments were characterized by high levels of multimedia stimulation, rapid information presentation, and increased screen-based interaction, which collectively interact with developing executive control systems in school-aged children.

Several empirical studies suggest that technology-enhanced classrooms can enhance student engagement and perceptual attention when multimedia elements are structured according to cognitive learning principles. Research on multimedia learning demonstrates that appropriately designed digital instructional materials can facilitate deeper information processing by integrating verbal and visual channels of working memory, thereby improving encoding efficiency and conceptual understanding (Mayer, 2014). In classroom settings, interactive digital tools such as smart boards and multimedia presentations have been associated with increased attentional orientation and active participation among students.

However, empirical evidence also indicates that prolonged screen exposure may influence sustained attention and cognitive endurance. A large-scale population study conducted by Dimitri Christakis (2019) reported associations between excessive screen exposure and difficulties in sustained attentional engagement among children. Similarly, a systematic review by Tina Stiglic and Russell Viner (2019) identified links between high screen time and attentional

dysregulation, impulsivity, and reduced psychological well-being among young populations.

From a neuropsychological perspective, these effects may be explained by the increased cognitive demands placed on executive attention networks. Continuous interaction with multimedia content requires rapid attentional switching, filtering of irrelevant stimuli, and ongoing updating of working memory representations. These processes are mediated by distributed neural networks involving the dorsolateral prefrontal cortex, anterior cingulate cortex, and parietal attention systems that support executive control and goal-directed cognition (Diamond, 2013).

Evidence from cognitive neuroscience further suggests that exposure to complex digital environments may influence information-processing dynamics and cognitive flexibility. Experimental studies have shown that certain interactive digital tasks can improve visuospatial attention and perceptual discrimination skills by strengthening attentional orienting mechanisms (Green & Bavelier, 2012). Such findings suggest that digital learning environments may stimulate perceptual-

cognitive networks associated with visual processing and attentional orienting when tasks require active engagement and adaptive responses.

At the same time, excessive multitasking within digital environments has been associated with reduced attentional filtering efficiency. A behavioral study conducted by Eyal Ophir, Clifford Nass, and Anthony Wagner (2009) found that individuals who frequently engaged in media multitasking demonstrated poorer performance on tasks requiring attentional control and distractor suppression. These findings suggest that frequent exposure to multiple streams of digital stimuli may weaken the ability to selectively prioritize relevant information during cognitively demanding tasks.

In the Indian context, pandemic-driven digital education initiatives further increased daily screen exposure among students. Studies examining the educational impact of the COVID-19 Pandemic in India reported increased cognitive fatigue, attentional strain, and reduced concentration among students participating in prolonged online learning sessions (Kapasias et al., 2020). Extended online instruction combined with reduced physical classroom interaction was

associated with decreased attentional persistence and increased mental fatigue in some student populations.

Collectively, these findings suggest that digital classroom learning influences multiple neurocognitive systems involved in learning, including attentional networks, working memory processes, and executive control mechanisms. While structured digital learning environments may enhance perceptual engagement and adaptive learning strategies, prolonged or poorly regulated screen exposure may contribute to cognitive fatigue and attentional fragmentation. The overall cognitive impact of digital classroom learning therefore appears to depend on the balance between instructional design, screen exposure duration, and executive control demands placed on students.

Neurocognitive Model of Digital Classroom Effects

A conceptual neurocognitive model emerging from the reviewed literature illustrates the interaction between digital learning environments and executive control systems in developing learners.

Neuropsychological Interpretation

From a neuropsychological standpoint, the cognitive effects observed in digital classroom environments can be understood through the interaction between developing executive systems and environmental stimulation. Executive functions—primarily mediated by the prefrontal cortex—are responsible for regulating attentional allocation, maintaining task goals, and suppressing irrelevant stimuli during learning activities (Diamond, 2013). Digital environments characterized by rapid stimulus changes and multiple simultaneous information streams may increase demands on these executive control mechanisms.

During childhood and adolescence, the prefrontal cortex and associated frontoparietal control networks undergo gradual maturation through processes such as synaptic pruning and myelination (Casey et al., 2005). Learning environments that impose excessive attentional switching or cognitive load may therefore challenge the developing neural systems responsible for sustained attention and cognitive control.

Conversely, digital learning platforms that incorporate structured instructional design, moderated stimulus presentation, and teacher-guided interaction may support

efficient activation of attentional networks and working memory systems. By aligning digital instructional strategies with the neurocognitive capacities of learners, educational technologies may enhance both cognitive engagement and academic performance.

Overall, the empirical evidence suggests that digital classrooms represent powerful cognitive environments that can either support or strain executive functioning depending on how technological tools are integrated into educational practice. Designing cognitively informed digital learning systems that respect attentional limits and cognitive load principles will therefore be essential for promoting optimal neurocognitive development in students.

Discussion

The present narrative review examined the neurocognitive implications of digital classroom learning on attentional processes and executive functioning among school students within the Indian educational context. The thematic synthesis revealed that digital learning environments represent complex cognitive ecosystems that interact with developing attentional systems,

executive control mechanisms, and information-processing networks. These findings align with contemporary cognitive neuroscience frameworks suggesting that learning environments characterized by high levels of sensory stimulation and rapid information presentation may significantly influence attentional allocation, working memory load, and cognitive regulation processes (Diamond, 2013; Mayer, 2014).

From a neuropsychological perspective, digital classroom environments introduce dynamic multimodal stimuli that activate distributed neural networks involved in perceptual processing, attentional orienting, and executive control. The dorsal attention network and frontoparietal control network are particularly implicated in maintaining goal-directed attentional engagement during cognitively demanding tasks (Corbetta & Shulman, 2002). Interactive multimedia platforms and hybrid learning models may enhance perceptual salience and learner engagement by integrating visual, auditory, and interactive cues that facilitate deeper encoding and information processing when appropriately structured within pedagogical frameworks (Mayer, 2014).

However, the findings of this review also highlight potential neurocognitive risks associated with prolonged exposure to screen-based learning environments. Sustained engagement with digital platforms may increase cognitive load, attentional fragmentation, and mental fatigue, particularly when instructional content involves continuous streams of multimedia information or rapid task-switching demands. According to cognitive load theory, excessive information processing demands may overwhelm working memory capacity, thereby impairing efficient learning and attentional persistence (Sweller, Ayres, & Kalyuga, 2011). In children and adolescents, whose executive control systems are still undergoing neurodevelopmental maturation, such demands may place additional strain on prefrontal cortical networks responsible for inhibitory control, cognitive flexibility, and goal maintenance (Best & Miller, 2010).

Neurodevelopmental evidence suggests that executive functioning undergoes gradual maturation throughout childhood and adolescence through processes such as synaptic pruning, increased myelination, and strengthening of functional connectivity between the prefrontal cortex and parietal

brain regions (Casey, Tottenham, Liston, & Durston, 2005). Environmental contexts that require sustained attentional regulation and cognitive control may therefore interact with these developmental processes. Excessive or poorly structured digital learning environments may contribute to fragmented attentional patterns and reduced capacity for sustained cognitive engagement, particularly in younger students who may have limited executive control capacity (Christakis, 2019).

Another important finding emerging from this review concerns the role of self-regulation in digital learning contexts. Unlike traditional classroom environments where teachers provide continuous attentional guidance and behavioral regulation, digital learning platforms often require students to independently manage learning tasks, monitor progress, and regulate potential distractions. These demands rely heavily on executive functioning processes such as working memory updating, inhibitory control, and cognitive flexibility (Diamond, 2013). Research on media multitasking has shown that frequent exposure to multiple digital stimuli may be associated with reduced attentional filtering efficiency and increased susceptibility to distraction,

suggesting that digital environments may challenge students' capacity to maintain sustained goal-directed attention (Ophir, Nass, & Wagner, 2009).

At the same time, it is important to recognize that digital learning environments are not inherently detrimental to cognitive development. When designed using principles derived from cognitive science and instructional psychology, digital technologies may facilitate interactive learning, adaptive instruction, and individualized feedback, thereby supporting cognitive engagement and knowledge acquisition (Mayer, 2014). The key determinant appears to be the manner in which digital technologies are integrated into educational practices, including the structure of instructional tasks, duration of screen exposure, and availability of teacher-mediated cognitive scaffolding.

The findings also underscore systemic and infrastructural factors influencing digital education in India. The persistent digital divide across socioeconomic and geographic contexts continues to limit equitable access to digital learning resources. Unequal exposure to cognitively stimulating educational environments may contribute to disparities in attentional development, academic

performance, and executive functioning skills among students (UNESCO, 2021). Addressing these disparities requires coordinated policy initiatives that ensure equitable access to digital infrastructure while simultaneously promoting cognitively sustainable learning practices.

Overall, the evidence synthesized in this review suggests that digital classroom learning represents a complex intersection between technological innovation and neurocognitive development. While digital technologies may enhance perceptual engagement and learning flexibility, excessive or poorly structured digital exposure may challenge attentional regulation and executive control systems. A neuropsychologically informed approach to digital education is therefore essential to ensure that technology-mediated learning environments support rather than compromise students' cognitive development.

Role of Neuropsychologists

The increasing integration of digital technologies into educational systems highlights the growing relevance of neuropsychological expertise in educational

planning and pedagogical design. Neuropsychologists are uniquely positioned to contribute to the development of cognitively informed digital learning environments by applying knowledge derived from cognitive neuroscience, developmental neuropsychology, and executive functioning research to educational contexts (Diamond, 2013; Meltzer, 2018).

One important role of neuropsychologists involves the assessment and monitoring of cognitive processes that are essential for effective learning, including attentional control, working memory capacity, cognitive flexibility, and inhibitory regulation. Through standardized neuropsychological assessments and cognitive task paradigms, neuropsychologists can help identify how different digital learning modalities influence attentional stability and executive functioning among students (Lezak, Howieson, Bigler, & Tranel, 2012). Such assessments may be particularly valuable for identifying students who experience attentional difficulties or cognitive overload within technology-mediated learning environments.

Neuropsychologists can also play a key role in developing evidence-based guidelines for

the implementation of digital learning technologies in schools. By integrating findings from research on cognitive load, attentional networks, and executive functioning, neuropsychologists can help design digital learning frameworks that minimize attentional fragmentation and optimize cognitive engagement. For example, research suggests that structured learning intervals, reduced multimedia complexity, and incorporation of attentional recovery breaks may improve cognitive efficiency and reduce mental fatigue during digital learning tasks (Sweller et al., 2011; Mayer, 2014).

Another important contribution involves the development of cognitive training and executive functioning interventions for students who engage extensively with digital learning platforms. Neuropsychologically informed training programs targeting processes such as inhibitory control, working memory updating, and cognitive flexibility may enhance students' capacity to manage distractions and sustain goal-directed attention during digital learning activities (Diamond & Lee, 2011). Such interventions may be particularly beneficial for students

who exhibit attentional vulnerabilities or executive functioning difficulties.

Furthermore, neuropsychologists may contribute to teacher training programs aimed at improving educators' understanding of the cognitive demands associated with digital learning environments. Training teachers to recognize signs of cognitive fatigue, attentional overload, and executive dysfunction can help them implement instructional strategies that support students' attentional regulation and cognitive engagement. Teacher-mediated scaffolding of attentional control and goal maintenance may serve as an external regulatory mechanism that supports developing executive systems in students (Meltzer, 2018).

At a broader policy level, neuropsychologists may collaborate with educational policymakers, curriculum developers, and technology designers to ensure that digital educational platforms are aligned with principles of cognitive science and developmental neuropsychology. Integrating neuropsychological insights into educational policy can help guide decisions related to optimal screen exposure duration, cognitive load management, and the design of

developmentally appropriate digital learning environments.

In this context, neuropsychologists occupy a critical interdisciplinary role at the intersection of neuroscience, psychology, and education. Their expertise can help ensure that the rapid expansion of digital classrooms is accompanied by scientifically grounded strategies that promote attentional stability, executive functioning development, and healthy cognitive growth among students.

Limitations of the Study

The present study employed a narrative review methodology, which relies on qualitative synthesis rather than quantitative meta-analytic techniques. Consequently, the findings represent interpretative integration of existing literature rather than statistical estimates of effect sizes.

Additionally, empirical neuropsychological research examining digital classroom environments within the Indian context remains relatively limited. Much of the available literature focuses primarily on educational outcomes rather than detailed neurocognitive assessments.

Future Implications

Future research should prioritize interdisciplinary investigations integrating educational research, cognitive neuroscience, and developmental neuropsychology. Longitudinal studies employing neuropsychological assessment tools, experimental cognitive paradigms, and neuroimaging techniques may provide deeper insights into how sustained digital classroom exposure influences the maturation of attentional and executive control networks.

Conclusion and Call for Action

The present narrative review examined the potential neurocognitive implications of digital classroom learning on attentional processes and executive functioning among school students, with particular attention to the evolving Indian educational context. The synthesis of available literature suggests that digital learning environments represent a complex interaction between technological innovation and developing cognitive systems. When integrated within structured pedagogical frameworks, digital classrooms may enhance student engagement, support multimodal learning, and facilitate access to diverse educational resources. Interactive multimedia tools and blended learning

approaches may stimulate attentional orienting and information processing by engaging distributed neural networks associated with perceptual integration and cognitive control (Mayer, 2014).

At the same time, the findings highlight several neurocognitive challenges associated with prolonged screen-based learning. Sustained exposure to multimedia stimuli, continuous online instruction, and high levels of digital stimulation may increase cognitive load and place substantial demands on attentional regulation and executive control processes mediated by the developing prefrontal cortex (Diamond, 2013; Best & Miller, 2010). Excessive or poorly structured digital learning environments may contribute to attentional fatigue, reduced cognitive endurance, and fragmented attentional patterns among students, particularly during extended periods of online instruction (Christakis, 2019). These considerations suggest that the cognitive architecture of digital classrooms must be carefully designed to align with the developmental capacities of learners.

The rapid expansion of digital learning in India, accelerated during the COVID-19 Pandemic, further emphasizes the need for

cognitively informed educational practices. While digital education initiatives have expanded access to learning resources, there remains a need to incorporate principles from cognitive neuroscience and developmental neuropsychology into the design of digital learning environments (UNESCO, 2021). Educational policies and instructional strategies should therefore consider attentional capacity, cognitive load management, and executive functioning demands when implementing technology-mediated instruction.

Moving forward, interdisciplinary collaboration between educators, policymakers, and neuropsychologists will be essential. Neuropsychological expertise can contribute to the development of evidence-based guidelines for digital learning, including optimal screen exposure duration, structured learning intervals, and strategies that support attentional regulation and executive functioning among students. In addition, future research should prioritize longitudinal and experimental studies examining how sustained digital classroom exposure influences the development of attentional networks and executive control systems in children and adolescents.

In conclusion, digital classrooms represent both an opportunity and a challenge for modern education. Ensuring that these environments promote effective learning while supporting healthy cognitive development requires a balanced, scientifically informed approach. Integrating neuropsychological insights into educational policy and digital pedagogy will be critical for creating learning systems that foster sustained attention, executive functioning, and long-term academic success in the digital era.

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3. Ethics Approval:

Ethics approval was not required for this study as it did not involve human/animal subjects.

4. Informed Consent:

Yes, informed written consent was obtained from all participants.

5. Data Availability Statement:

The data that support the findings of this study are available upon reasonable request from the corresponding author.

6. Author Contributions (Credit Statement):

☐ Author 1: Conceptualisation, Methodology, Writing – Original Draft

☐ Author 2: Data Curation, Formal Analysis, Writing – Review & Editing

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Article

Impact Of Smartphone Usage On Attention: A Cognitive Load Theory – Based Explanation

Article History

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Abstract

The rapid increase in smartphone usage has raised concerns regarding its impact on the cognitive functioning of college students, particularly attention and cognitive load. Although numerous studies have examined smartphone addiction and cognitive outcomes, a limited research has focused specifically on the impact of multitasking with smartphones in natural academic settings. A significant research gap exists in understanding how everyday digital multitasking behaviors influence attention and perceived cognitive load among college students. The present study aims to examine the relationship between smartphone usage, multitasking behaviors, attention, and cognitive load among undergraduate students. The study proposes to employ a correlational research design using convenience sampling. The sample will consist of undergraduate students aged 18–25 years from various academic disciplines. Statistical techniques such as descriptive statistics and correlation analysis will be used

to examine the relationships among the variables. A sample of 80 undergraduate students will be selected using convenience sampling. Data will be collected using the Smartphone Addiction Scale – Short Version (SAS-SV) to measure smartphone usage, the Mindful Attention Awareness Scale (MAAS) to assess attention. It is expected that higher smartphone usage will be associated with lower levels of attention and increased cognitive load. The proposed study is expected to provide insights into how smartphone-based multitasking influences attention and mental effort in academic contexts. The findings may contribute to promoting healthier digital habits and improving students' cognitive well-being

Keywords :

Smartphone Usage, Media Multitasking, Attention, Cognitive Load, Digital Distraction, Academic Context

1. Introduction**1.1 Overview of the Study**

Technology has rapidly evolved, making smartphones an indispensable part of daily life. Beyond communication, smartphones are widely used for education, entertainment,

social networking, online learning, and information access. College students, in particular, rely on smartphones for academic tasks such as preparing presentations, accessing study materials, conducting research, and communicating with peers and teachers. While smartphones offer convenience and educational support, excessive use, constant notifications, and multitasking can negatively affect attention and cognitive functioning.

Attention refers to the ability to focus on relevant information while ignoring distractions and is essential for learning and academic performance. Cognitive load refers to the mental effort required to process information within the limited capacity of working memory. Frequent smartphone use and digital multitasking may increase cognitive load, reducing concentration, comprehension, and decision-making ability.

College students aged 18–25 are in a critical developmental stage characterized by increasing academic, social, and career-related responsibilities. Their extensive smartphone use, combined with frequent switching between academic and non-academic activities, may contribute to reduced attention, increased mental fatigue,

and impaired cognitive performance. Therefore, the present study aims to examine the impact of smartphone usage on attention and cognitive load among college students to better understand its effects on cognitive functioning and academic well-being.

1.2 Theoretical Perspectives

Various psychological theories explain the relationship between smartphone use, attention, and cognitive load. Cognitive Load Theory states that working memory has limited capacity, and excessive digital information can reduce learning efficiency. Attention Theory suggests that smartphone use competes for limited attentional resources. Frequent smartphone checking and multitasking interrupt attention, reduce working memory capacity, and impair concentration. Over time, excessive smartphone dependence may weaken self-control, increase reliance on digital aids, and negatively affect deep learning and sustained attention.

1.3 Review of literature

Ning, Davis, and Taraban (2018) conducted a study titled Smartphone Addiction and

Cognitive Performance of College Students.

The study examined the adverse effects of smartphone addiction on cognitive performance among 200 business students using an experimental design. The Smartphone Addiction Scale, Letter Memory Task, and Wisconsin Card Sorting Test were used, and data were analyzed using factorial MANOVA. The findings showed that smartphone addiction negatively affected cognitive performance, particularly under stressful and distracting conditions, suggesting that reducing smartphone addiction may improve cognitive and academic performance.

Anwar, Hayat, and Abbas (2024) conducted a systematic literature review titled The Dual Impact of Smartphone Usage on Short-Term Memory, Attention, and Academic Performance in Digital Learning Environments. Reviewing studies from Scopus, Google Scholar, and PubMed, they found that while structured smartphone use can improve engagement and retention, excessive use leads to cognitive overload, distraction, and poor academic performance. They recommended balanced smartphone integration, digital literacy programs, and

further longitudinal and cross-cultural research.

Oyasor (2025), in *Cognitive Load and Smartphones: How Mere Presence Impacts Mental Performance*, examined the effect of smartphone presence on attention among 300 undergraduate students using an experimental design. The d2-R Attention Test and Smartphone Addiction Scale (d-KV-SSS) were used. The study found that even the mere presence of a smartphone reduced attention, processing speed, and cognitive performance, suggesting the need for self-regulation strategies such as using “Do Not Disturb” mode.

Mohesh, Glad, and Jha (2025) investigated the impact of smartphone addiction on attention and eye health among 260 medical students using a cross-sectional design. Data collected through standardized Google Form questionnaires revealed that smartphone addiction reduced attention, affected academic performance, and increased eye-related problems, with higher addiction levels among male students.

Krumsvik (2025), in the editorial *Smartphones, Media Multitasking and Cognitive Overload*, reviewed evidence from

meta-analyses and empirical studies. The findings indicated that smartphones and media multitasking increase cognitive load, reduce attention and memory, and negatively affect academic performance. The author recommended limiting smartphone use during classroom instruction.

Alasmari (2020) examined the effect of mobile screen size on cognitive load among 1,570 university students. The study found that small smartphone screens produced the lowest cognitive load, whereas small tablets produced the highest. The findings emphasized designing mobile learning content to reduce unnecessary cognitive load and improve learning.

Kim et al. (2020) studied the impact of smartphone use on gait among 42 healthy young adults. Using the GAITRite walkway system, the study found that texting and even adopting a texting posture reduced walking speed, shortened stride length, and increased support time, demonstrating the effects of cognitive load and divided attention on motor performance.

Kao (2023) examined the relationships among loneliness, smartphone addiction, sleep quality, and attention among 587

Taiwanese undergraduate students using structural equation modeling. The study found that smartphone addiction negatively affected attention and sleep quality, while better sleep improved attention. Loneliness was also found to predict smartphone addiction, indirectly affecting attention.

Wilmer et al. (2017), in their review *Smartphones and Cognition*, examined research on smartphone habits and cognitive functioning. The review concluded that smartphone use, particularly notifications and media multitasking, disrupts attention, memory, and reward processing. Although immediate effects on attention were evident, evidence regarding long-term cognitive effects remained limited, highlighting the need for more longitudinal research.

1.4 Research gap

While existing research has examined smartphone addiction, mere presence of devices, and media multitasking, limited attention has been given to everyday academic multitasking behaviors of college students. Most studies focus on controlled experimental conditions rather than habitual practices such as studying while streaming videos, listening to music, or switching

between social media and academic tasks. Moreover, prior research often treats attention and cognitive load as separate constructs, with fewer studies examining their combined influence within real educational settings. Therefore, there is a need to investigate how smartphone usage and multitasking affect both attention and cognitive load simultaneously among college students in natural academic environments.

1.5 Need and Significance of the Study

As smartphone use among young adults continues to increase, understanding its psychological effects has become important. Although smartphones support academic activities, excessive and unregulated use can lead to distraction, cognitive overload, stress, and reduced learning efficiency (Smith et al., 2023). Therefore, it is essential to examine how smartphone use influences attention and cognitive load among college students. This study aims to enhance understanding of the relationship between smartphone usage, attention, and cognitive load in everyday academic settings. Unlike previous studies that focused on academic performance or digital behavior separately, this study integrates smartphone habits with cognitive processes to provide a broader understanding

of their impact on young adults (Pereira et al., 2024).

1.6 Objectives of the study

1. To examine the relationship between smartphone usage and attention.
2. To examine the relationship between smartphone usage and cognitive load.
3. To study the effect of smartphone-based multitasking on attention and cognitive load

1.7 Hypothesis

1. There will be a significant relationship between smartphone usage and attention among college students.

2. Methodology

Aim:

To understand the relationship between smartphone with attention and cognitive load

Variables of the study

Independent Variable(IV) : Smartphone Usage

Dependent Variables(DV) : Attention and Cognitive Load

Sample: The study will include 80 undergraduate students aged 18–25 years from various academic disciplines, selected through convenience sampling. Both male and female students will participate. Individuals with diagnosed neurological or physiological disorders will be excluded to avoid confounding effects on attention and cognition.

Sampling Technique: The research will utilize a convenience sampling technique, selecting participants based on their availability and willingness to join. This approach is suitable for exploratory academic studies carried out in institutional environments and enables efficient data gathering from the intended group.

Research Design: This study uses a descriptive correlational research design to examine the relationship between smartphone usage, attention, among college students. The design is suitable as it allows the assessment of naturally occurring variations in smartphone use and their association with cognitive functioning without manipulating variables. The study

focuses on understanding how smartphone-based multitasking and usage patterns relate to attention levels and perceived cognitive load in academic contexts

Procedure:

Data were collected from undergraduate students aged 18–25 years using a structured online questionnaire created through Google Forms. Prior to data collection, participants were informed about the purpose of the study and their consent was obtained. The form was distributed through online platforms such as WhatsApp and email. Participants were instructed to respond honestly, and anonymity and confidentiality were maintained throughout the study. The collected data were screened for completeness, and only fully completed responses were included in the final analysis.

Tools Used:

- Smartphone Addiction Scale – Short Version(SAS-SV).
- Mindful Attention Awareness Scale.

Statistical Analysis:

The data obtained were analyzed using descriptive and inferential statistics. Descriptive statistics (mean and

standard deviation) were computed to summarize the levels of smartphone usage, attention among participants. Pearson's correlation analysis was used to examine the relationship between: Smartphone usage and attention

Ethical Considerations:

- Informed consent was obtained from all participants after explaining the purpose of the study.
- Participation was completely voluntary, and participants could withdraw at any time.
- Confidentiality and anonymity of participants were strictly maintained.
- The study ensured no physical or psychological harm to participants.
- Collected data was used solely for research purposes and stored securely.

3. Analysis

Table 1: *Descriptive Statistics for Courses in Undergraduate (N = 82)*

Variable	M	SD	Min	Max	Skewness	Kurtosis
Courses in Undergraduate	2.95	1.80	1	7	0.49	-0.71

Table 1 presents the descriptive statistics for undergraduate courses (N = 82). The mean

score was 2.95 (SD = 1.80), with values ranging from 1 to 7, indicating variability among participants. The skewness (0.49) and kurtosis (-0.71) values suggest a slightly positively skewed, relatively flat distribution with no major deviation from normality, indicating that the data were suitable for further statistical analysis.

Table 2
Descriptive Statistics for SAS-SV and MAAS (N = 82)

Variable	M	SD	N
SAS-SV	57.83	15.15	82
MAAS	32.88	10.42	82

Table 02 presents the mean and standard deviation for smartphone usage (SAS-SV) and attention (MAAS). The mean smartphone usage score (M = 57.82, SD = 15.15) indicates moderate to high smartphone use, while the attention score (M = 32.87, SD = 10.42) reflects moderate attentional awareness. The variability in both measures suggests individual differences in smartphone use and attention, with excessive smartphone use potentially contributing to reduced attention. These findings are

consistent with previous research on digital behavior and cognitive functioning.

Table 3
Correlation Between Smartphone Usage (SAS-SV) and Attention (MAAS)

Variable	1	2
1. MAAS	—	-.48**
2. SAS-SV	-.48**	—

Table 03 indicates a statistically negative correlation between smartphone usage (SAS-SV) and attention (MAAS) ($r = -0.478$, $p < .01$). This finding suggests that higher levels of smartphone usage are associated with lower levels of attentional awareness among college students. The strength of the correlation reflects a moderate relationship, indicating that smartphone usage plays a meaningful role in influencing attention, although it is not the sole contributing factor.

This result may be explained by the frequent multitasking behaviors associated with smartphone use, such as switching between academic tasks and digital activities. Such behaviors can fragment attention and reduce the ability to sustain focus over time. The

finding is consistent with existing literature, which highlights that excessive smartphone engagement and constant digital interruptions can impair attentional control and increase cognitive strain.

1. Findings:

The present study examined the relationship between smartphone usage, attention, and cognitive load among college students. The findings showed moderate to high smartphone usage and moderate levels of attention among participants. A significant negative correlation was found between smartphone usage and attention ($r = -0.478$, $p < .01$), indicating that increased smartphone use is associated with reduced attentional awareness.

These findings can be explained using Cognitive Load Theory, which states that working memory has limited capacity. Frequent smartphone use, notifications, and multitasking increase cognitive load, reducing attentional control and information processing. Continuous switching between academic and digital tasks divides cognitive resources, leading to poorer concentration and cognitive efficiency.

The results are consistent with previous research showing that excessive smartphone use and digital interruptions impair attention. However, as the study used a correlational design, no causal relationship can be established. Future experimental and longitudinal studies are recommended to further examine the role of cognitive load in the relationship between smartphone usage and attention.

5. Conclusion

The present study aimed to examine the relationship between smartphone usage, attention, and cognitive load among college students. The findings suggest that increased smartphone usage is associated with reduced attention and higher cognitive load, particularly in the context of frequent multitasking. These results highlight the cognitive challenges posed by excessive and unregulated smartphone use in academic environments.

The study contributes to the existing knowledge by simultaneously examining attention and cognitive load within natural academic settings, rather than controlled experimental conditions. It

emphasizes how everyday digital multitasking behaviors, such as switching between academic tasks and smartphone activities, can negatively influence students' cognitive efficiency and learning processes.

Implications of the Study

1. The study highlights the negative impact of excessive smartphone usage on attention, emphasizing the need for mindful usage among students.
2. It provides theoretical support through Cognitive Load Theory, helping explain how continuous smartphone engagement may burden cognitive processing and reduce attentional capacity.
3. The findings can help educators and institutions design strategies to minimize distractions and improve students' focus in academic settings.
4. It offers insights for students to develop better self-regulation practices, such as limiting screen time and managing digital distractions.
5. The study can guide mental health professionals and counselors in

addressing attention-related concerns linked to smartphone overuse.

6. It lays a foundation for future research and interventions, especially in developing programs like digital detox or structured technology use.

Limitations of the study:

1. Convenience sampling limits the generalizability of the findings to the broader population.
2. Small sample size (N = 80) may not adequately represent the wider student population.
3. Use of self-report measures may introduce response bias, affecting data accuracy.
4. Correlational research design restricts the ability to establish cause-and-effect relationships between variables.
5. The cognitive over load isn't measured in the study rather it was explained with the existing theories

Future suggestions:

1. Future studies should include larger and more diverse samples to enhance

generalizability. Researchers may adopt longitudinal designs to examine changes over time.

2. Experimental research designs can be used to better establish causal relationships.
3. Further research can explore intervention strategies to manage smartphone usage.
4. Studies may investigate practices such as digital detox to reduce cognitive overload.
5. Research can also examine structured smartphone usage patterns to improve attention among students.

In conclusion, while smartphones are valuable tools for academic and personal use, their excessive and multitask-oriented usage may hinder cognitive functioning. Promoting mindful and regulated smartphone use is essential to support students' attention, reduce cognitive load, and enhance overall academic performance.

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The authors declare no conflict of interest with respect to the research, authorship, or publication of this article.

3. Ethics Approval:

Ethics approval was not required for this study as it did not involve human/animal subjects.

4. Informed Consent:

Yes, informed written consent was obtained from all participants.

5. Data Availability Statement:

The data that support the findings of this study are available upon reasonable request from the corresponding author.

6. Author Contributions (Credit Statement):

☐ Author 1: Conceptualisation, Methodology, Writing – Original Draft

☐ Author 2: Data Curation, Formal Analysis, Writing – Review & Editing

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Article

The Relationship Between Metacognitive Awareness And Cognitive Failure

Article History

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Abstract

In today's world, people spend a large part of their day on phones and social media. This constant digital use has led to a rise in small but common mental mistakes such as forgetting where an object was kept, losing track of a conversation, or not remembering why you walked into a room. These kinds of everyday errors are called cognitive failures. This study looked at whether people who are more aware of how they think tend to make fewer of these errors. This awareness of one's own thinking is called metacognitive awareness. A total of 77 young adults between the ages of 18 and 25 took part in the study. They filled out two questionnaires, the Metacognition Self Assessment Scale (MSAS) to measure metacognitive awareness, and the Cognitive Failures Questionnaire (CFQ) to measure how often they make everyday mental errors. The results showed a significant negative relationship between the two variables ($r = 0.302$, $p = 0.008$), meaning that people with

higher metacognitive awareness made fewer cognitive errors. The null hypothesis was rejected. These findings suggest that being more aware of how one thinks can help reduce mental mistakes, especially in a world full of digital distractions.

Keywords:

Metacognition, Cognitive Failure, Technology Driven Distractions, Digital Age, Self Regulation, Young Adults

Introduction

Most people today have experienced moments like forgetting why they opened the fridge, re-reading a message twice without understanding it, or leaving a tap running after walking away. These small everyday mistakes have become very common, especially among young people who spend a lot of time on their phones and social media. In psychology, such errors are called cognitive failures. They include mistakes in memory, attention, and everyday actions. As the use of digital technology has grown, so has the number of these failures. Constant notifications, multitasking on apps, and the habit of switching between tasks all make it harder for the brain to stay focused.

However, not everyone faces the same number of these problems. Some people manage to stay sharp and organized even with heavy phone use, while others keep forgetting things or losing focus. One possible reason for this difference is metacognitive awareness, which simply means how well a person understands and controls their own thinking. A person with good metacognitive awareness notices when their attention is slipping and brings it back before making a mistake. Someone with low metacognitive awareness may not even realize they have made an error until it is too late.

Flavell (1979) was one of the first to explain metacognition. He described it as the ability to think about and manage your own thinking. Broadbent, Cooper, FitzGerald, and Parkes (1982) explained that cognitive failures are not caused by a lack of intelligence. They happen because people lose control of their attention for a short time. In a world where phones and apps constantly pull our attention away, this loss of control becomes very easy. Leroy (2009) showed that when a person is interrupted while doing a task, a part of their mind stays stuck on the interruption, making it harder to focus on the

main task. Bauer and colleagues (2025) found that heavy technology use over time can actually reduce a person's ability to monitor their own thinking. This study was done to find out whether better metacognitive awareness is linked to fewer cognitive failures among young adults who use digital platforms regularly.

Literature Review

Flavell (1979) described metacognition as the ability to observe and guide your own thinking. According to him, it has two main parts. The first is metacognitive knowledge, which means knowing how your own mind works, what kind of tasks you are good at, and what strategies help you learn or remember. The second is metacognitive regulation, which means actually using that knowledge while doing a task, checking if you are on the right track, and correcting yourself when you make a mistake. Together these two parts help people avoid errors and learn more effectively.

Broadbent and colleagues (1982) created the Cognitive Failures Questionnaire (CFQ) to measure how often people make everyday mental mistakes. The CFQ covers three types of errors. The first is memory errors, like

forgetting where you kept your keys or forgetting what someone told you. The second is attention errors, like missing what someone said in a conversation. The third is action errors, like starting a task but finishing a different one by mistake. The CFQ has been widely used in research for over 40 years and is considered a reliable tool.

Schraw and Dennison (1994) developed the Metacognitive Awareness Inventory (MAI) to measure how aware people are of their own thinking. The MAI has two parts. The first part measures what a person knows about their own thinking, including whether they know which study methods work best for them. The second part measures whether a person can plan, check, and fix their thinking while doing a task. Later, Schraw, Crippen, and Hartley (2006) found that students who scored higher in metacognitive awareness performed better in studies, even when intelligence was not a factor. This shows that knowing how to manage your own thinking can make a real difference.

Research has also shown that digital devices harm our ability to focus. Leroy (2009) found that when a person switches tasks because of an interruption, they cannot fully concentrate on the new task straight away. A part of their

mind is still thinking about the previous task. When this happens many times throughout the day due to notifications and app switching, it becomes harder to stay focused and avoid mistakes. Hartanto and colleagues (2023) studied 302 people over several days and found that those who checked their phones very frequently made more cognitive errors each day. This gave strong evidence that phone habits directly affect how many mental mistakes people make.

Social media use also plays a role. Verduyn and colleagues (2015) found that people who scroll through social media without any particular purpose tend to develop unhelpful thoughts about their own thinking and become less alert. When a person is less alert, they are more likely to make small but repeated mental mistakes throughout the day.

Carrigan and Barkus (2016) reviewed 45 studies on cognitive failures and found that these mistakes are more common when people are tired, stressed, or not sleeping well. They also noted that some people are naturally more prone to these errors than others. The good news is that people with better metacognitive awareness tend to stay careful even when they are stressed or tired,

because they have developed the habit of watching how their own mind is working.

In India, Omprakash and colleagues (2021) tested the Metacognitive Awareness Inventory on 933 medical students and confirmed that it works well as a measuring tool in the Indian context. Other Indian studies also found that students who scored higher in metacognitive regulation got better marks in their exams ($r = 0.293$, $p = 0.001$). This shows that metacognitive awareness is not just a Western concept. It is relevant and measurable in Indian student populations as well.

Goodhew and Edwards (2024) updated the Cognitive Failures Questionnaire to match modern life better. The original version did not include mistakes related to technology, like forgetting a password or getting distracted during a video call. The new version, called the CFQ 2.0, includes these types of errors and was found to predict actual cognitive performance better than the older version. This update confirms that technology has changed the way cognitive failures happen in daily life and that research tools need to reflect this change.

Research Gap

Most studies on metacognitive awareness and cognitive failures have looked at them separately. Very few studies have checked whether the two are directly connected in a world where digital technology is so widely used. Most older studies were done before smartphones became so common. Also, the original cognitive failure tools did not include technology related mistakes. In India, no study has specifically looked at whether metacognitive awareness helps protect young adults from the cognitive failures caused by heavy phone and social media use. This study was designed to fill that gap.

Methodology

This study used an ex post facto correlational design. This design was chosen because the aim was to find whether a relationship already exists between two variables, without changing or controlling anything. The study did not try to create a condition but only observed what was naturally there.

The sample included 77 young adults between 18 and 25 years of age. They were selected using convenient sampling. To be included in the study, participants had to be able to read and write in English and had to

use social media for at least five hours each day. People who had a diagnosed social media addiction or any mental health condition were not included in the study.

Two tools were used to collect data. The first was the Metacognition Self Assessment Scale (MSAS) by Pedone (2017). This scale has 18 questions and asks how often a person is aware of their own thinking, feelings, and mental processes. Responses are given on a five point scale from never to almost always. The second was the Cognitive Failures Questionnaire (CFQ) by Broadbent and colleagues (1982). This has 25 questions that ask how often a person makes everyday mistakes in memory, attention, and actions. Responses range from never to very often. Some basic details such as age, gender, and daily screen time were also collected.

Data were collected in person and through a Google Form. Before filling out the questionnaires, all participants were told about the purpose of the study and gave their consent. They were also told that their answers would be kept private. Any participant who did not understand a question was helped by the researcher. The data were analysed using Pearson correlation to check if there was a relationship between

metacognitive awareness and cognitive failures. An independent samples t test was also done to check if different groups within the sample showed different scores. A p value below 0.05 was used as the cutoff for significance.

Analysis and Findings

The main goal of the analysis was to find out if there is a link between metacognitive awareness and cognitive failure among the 77 participants.

Table 1: Correlation Between Metacognitive Awareness and Cognitive Failure

Variables	Pearson r	p value
Metacognitive Awareness and Cognitive Failure	0.302	0.008

The correlation result showed a negative relationship between metacognitive awareness and cognitive failure ($r = 0.302$, $p = 0.008$, $df = 74$). This means that people who are more aware of their own thinking tend to make fewer everyday mistakes. Since the p value is 0.008, which is less than 0.05, the result is statistically significant. The null hypothesis, which stated that there is no significant relationship between metacognitive awareness and cognitive failure in the digital age, is rejected. This

finding makes sense because people who regularly check how their own mind is working are more likely to catch themselves before making an error. The relationship is moderate in strength, which also suggests that other factors like sleep, stress, and time spent on screens may also play a role.

Table 2: Independent Samples T Test Results

Variable	t	df	p
Metacognitive Awareness	1.40	74	0.165
Cognitive Failure	1.05	74	0.295

The t test was done to check whether two groups in the sample scored differently on metacognitive awareness and cognitive failure. For metacognitive awareness, $t = 1.40$, $df = 74$, $p = 0.165$. For cognitive failure, $t = 1.05$, $df = 74$, $p = 0.295$. Both p values are above 0.05. So there is no significant difference between the two groups on either variable. The null hypothesis for both group comparisons is retained. This result is likely because both groups had a similar background. They were of the same age range, had a similar level of education, and used social media for similar amounts of time each day. When two groups are very similar to each other, it is difficult to find a difference between them. This does not contradict the

correlation result, because the correlation looks at the entire sample together, not at group differences.

These results support what earlier researchers have said. Flavell (1979) explained that when people think about how they are thinking, they are able to catch their mistakes early. Broadbent and colleagues (1982) said cognitive failures happen because attention breaks down, not because of low intelligence. When a person is good at watching their own attention, they can fix it before a mistake happens. This is especially important when using digital devices, where distractions come very frequently. The moderate correlation also suggests that researchers should look into other variables that might be involved, such as screen time per day, quality of sleep, and levels of stress.

Conclusion

This study looked at whether metacognitive awareness is related to cognitive failures among young adults who use digital platforms daily. The main finding was a significant negative correlation ($r = 0.302$, $p = 0.008$), which means that as metacognitive awareness increases, cognitive failures decrease. The null hypothesis was rejected

based on this result. People who are more aware of their own thinking make fewer everyday mental mistakes. The t test did not show any significant group differences, so the null hypotheses for those comparisons were retained. This is expected because the two groups in the sample were very similar to each other.

These findings have a useful message for students, teachers, and working professionals. In environments where digital devices are always present, training people to think about how they think can help them stay focused and avoid errors. Simple activities like reviewing what you have done at the end of a class, planning your tasks before starting, or noticing when your mind has wandered can all build metacognitive awareness over time. These habits do not require removing technology from daily life. They only require a small change in how a person relates to their own thinking.

This study has some limitations. The sample was collected through convenient sampling, which means it may not represent all young adults. Since this is a cross sectional study, we cannot say that one variable causes the other. Both variables were measured using self reported questionnaires, which means the

accuracy depends on how honestly and carefully the participants answered. In the future, researchers should use random sampling to get a more representative group. Longitudinal studies would help us understand how the relationship between metacognitive awareness and cognitive failures changes over time. Using objective tests for measuring attention and memory, along with actual screen time data from participants devices, would also make the findings stronger. Looking at other possible factors like sleep, stress, and executive function would give a more complete picture of why cognitive failures happen in the digital age.

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6. Author Contributions (Credit Statement):

☐ Author 1: Conceptualisation, Methodology, Writing – Original Draft

☐ Author 2: Data Curation, Formal Analysis, Writing – Review & Editing

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Appendices

Appendix- A

Metacognition Self-Awareness Scale

No.	Item	Never	Rarely	Sometimes	Frequently	Almost Always
A: Respect to Myself, Usually...						
1	I can distinguish and differentiate my own mental abilities (e.g. remembering, imagining, having fantasies, dreaming, desiring, deciding, foreseeing and thinking).	1	2	3	4	5
2	I can define, distinguish and name my own emotions.	1	2	3	4	5

3	I am aware of what are the thoughts or emotions that lead my actions.	1	2	3	4	5
4	I am aware that what I think about myself is an idea and not necessarily true. I realize that my opinions may not be accurate and may change.	1	2	3	4	5
5	I am aware that what I wish or what I expect may not be realized and that I have a limited power to influence things.	1	2	3	4	5
6	I can clearly perceive and describe my thoughts, emotions and relationships in which I am involved.	1	2	3	4	5
7	I can describe the thread that binds my thoughts and my emotions even when they differ from one moment to the next.	1	2	3	4	5

B: Respect to Others, Usually...						
8	I can understand and distinguish the different mental activities as when they are, for	1	2	3	4	5

example, remembering, imagining, having						
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	fantasies, dreaming, desiring, deciding, foreseeing and thinking.					
9	I can identify and understand the emotions of people I know.	1	2	3	4	5
10	I can describe the thread that binds thoughts and emotions of people I know, even when they differ from one moment to the next.	1	2	3	4	5

C: Respect to 'Putting Yourself in Somebody's Shoes', Usually...						
11	I'm aware that I am not necessarily at the centre of the other's thoughts, feelings and emotions and that other's behaviours arise from reasons and goals that can be independent from my own perspective and from my own involvement in the relationship.	1	2	3	4	5

12	I am aware that others may perceive facts and events in a different way from me and interpret them differently.	1	2	3	4	5
13	I am aware that age and life experience can touch other's thoughts, emotions and behaviour.	1	2	3	4	5

D: Respect to Solving Problems, Usually...						
14	I can deal with the problem voluntarily imposing or inhibiting a behaviour on myself.	1	2	3	4	5
15	I can deal with the problems voluntarily trying to follow my own mental order.	1	2	3	4	5
16	I can deal with the problems trying to challenge or enrich my views and my beliefs on problems themselves.	1	2	3	4	5
17	When problems are related to the relationship with the other people, I try to solve them on the basis of what I believe to be their mental functioning.	1	2	3	4	5

18	I can deal with the problems, recognizing and accepting my limitations in managing myself and influencing events.	1	2	3	4	5
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Appendix- B

Cognitive Failure Questionnaire

No.	Item	Never	Very rarely	Occasionally	Quite often	Very rarely
1	Do you read something and then find you haven't been thinking about it and must read it again?	0	1	2	3	4

2	Do you find you forget why you went from one part of the house to the other?	0	1	2	3	4
3	Do you fail to notice signposts on the road?	0	1	2	3	4
4	Do you find you forget whether you've turned off a stove or a light or locked the door?	0	1	2	3	4
5	Do you fail to listen to people's names when you are meeting them?	0	1	2	3	4
6	Do you find you forget appointments?	0	1	2	3	4
7	Do you find you lose important things around the house?	0	1	2	3	4
8	Do you find yourself bumping into people?	0	1	2	3	4
9	Do you find you forget what you came to the shops to buy?	0	1	2	3	4
10	Do you find you start reading something when you are trying to do something else?	0	1	2	3	4

11	Do you find you put something in a safe place and then forget where you put it?	0	1	2	3	4
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12	Do you find yourself taking a wrong turning when walking or driving?	0	1	2	3	4
13	Do you find yourself forgetting people's names?	0	1	2	3	4
14	Do you find you accidentally throw away the thing you want and keep what you meant to throw away?	0	1	2	3	4

15	Do you find yourself forgetting things someone told you a day or two ago?	0	1	2	3	4
16	Do you fail to see what you want in a shop, even though it's there?	0	1	2	3	4
17	Do you find you say something and then realize you said it to the wrong person?	0	1	2	3	4
18	Do you find you miss a turn-off on a road you know well?	0	1	2	3	4
19	Do you find yourself knocking things over?	0	1	2	3	4
20	Do you find you can't think of anything to say?	0	1	2	3	4
21	Do you find you lose track of what you were saying in the middle of a conversation?	0	1	2	3	4
22	Do you find you forget where you put something immediately after putting it down?	0	1	2	3	4

23	Do you forget which way to turn on a road you know well but rarely use?	0	1	2	3	4
24	Do you find you start doing one thing at home and get distracted into doing something else?	0	1	2	3	4
25	Do you find yourself daydreaming when you ought to be listening?	0	1	2	3	4

Article

Screen Time, Delayed Time: A Study On The Relationship Between Social Media Use And Procrastination Habits Among College Students

Article History

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Abstract

This study investigates the relationship between social media use and procrastination habits among college students in India. Employing a quantitative research design, the study aims to determine if there is a significant relationship between the amount of time spent on social media and the tendency to procrastinate. The sample consists of 67 university students, both males and females, selected using a non-probability purposive sampling technique, ensuring that all participants are active social media users. Data was collected through standardized questionnaires: the Social Media Use Scale and the Procrastination Scale. Descriptive statistics, including Correlation Analysis along with Independent Samples T Test were utilized to analyse the data using PSPP. The findings demonstrated a preference for consumption-based social media activities, with females exhibiting higher participation in comparison-based and consumption-based activities compared to males. However, no

significant gender difference was seen in procrastination levels among the subjects. The study also showed no significant relationship between social media use and procrastination, suggesting that variables other than social media may play a more relevant role in determining procrastination practices among college students.

Keywords:

social media use, procrastination, college students

Introduction

Social media has become an essential part of daily life, particularly among college students. It enables users to communicate, share information, and build virtual communities through platforms such as Facebook, Instagram, YouTube, WhatsApp, and X (formerly Twitter). In India, social media use has grown rapidly, with millions of active users, making these platforms a significant part of students' academic and social lives. Besides communication and entertainment, social media also supports learning by facilitating collaboration, information sharing, and interaction beyond the classroom (George & Dellasega, 2011). However, excessive use has been associated

with reduced academic performance, decreased offline social engagement, and other negative outcomes (Griffiths et al., 2014).

Social media use can be active or passive. Active use includes posting content, commenting, and interacting with others, whereas passive use mainly involves browsing without direct participation (Lai et al., 2023; Winstone et al., 2023). Previous studies have also suggested that frequent social media use may contribute to problematic usage patterns and interfere with daily functioning (Jamil et al., 2020).

Procrastination refers to the voluntary delay of intended tasks despite knowing that the delay may result in negative consequences (Lay, 1986). It is common among university students and has been associated with poor academic achievement, stress, anxiety, low self-esteem, and reduced psychological well-being (Steel, 2007; Klingsieck, 2013). Research indicates that approximately 70% of university students report procrastination behaviours, making it one of the most common academic challenges (Pala et al., 2011).

Several researchers have proposed that social media may contribute to procrastination because it provides immediate gratification and continuous access to entertaining content.

Frequent notifications, endless scrolling, and social interactions can distract students from academic tasks, leading to poor time management and delayed completion of responsibilities (Rozgonjuk et al., 2018; Meier et al., 2023). Excessive social media use has also been associated with problematic smartphone use, internet addiction, and reduced productivity (Andreassen et al., 2012; Masrom et al., 2021). Nevertheless, previous findings have been inconsistent, with some studies reporting strong relationships between social media use and procrastination, while others have found weak or non-significant associations.

Given the widespread use of social media among college students and the mixed findings reported in previous research, further investigation is warranted. Therefore, the present study examined the relationship between social media use and procrastination habits among college students. The study also explored whether social media use and

procrastination differed between male and female students.

Literature Review

Social Media Use

The increasing use of social media among university students has attracted considerable research attention because of its influence on communication, learning, and daily functioning. Hunter and Taylor (2019) found that privacy preferences and gender influenced social media usage patterns. Similarly, Allahverdi (2022) reported that many university students perceived themselves as highly dependent on social media, with female students reporting greater dependency than males. These findings suggest that social media use varies according to individual characteristics and patterns of engagement.

Social Media Use and Gender

Several studies have explored gender differences in social media use, although the findings remain inconsistent. Maranita et al. (2019) found that female students used Instagram more frequently in their daily lives, whereas male students primarily used it for following news and sports. In contrast,

Dinçer and Kiliç (2019) reported no significant gender differences in overall social media use. Likewise, Ping et al. (2021) found that gender was not significantly associated with academic performance related to social media use. These mixed findings indicate the need for further investigation.

Academic Procrastination

Academic procrastination is common among university students and has been associated with poor academic performance and ineffective time management. Özer et al. (2009) reported higher procrastination among male students, whereas Gohain et al. (2021) found no significant gender differences. These contrasting findings suggest that procrastination may be influenced by multiple psychological and contextual factors rather than gender alone.

Social Media Use and Procrastination

Research has consistently examined whether social media contributes to procrastination. Anierobi et al. (2021) reported that excessive social media use predicted higher levels of academic procrastination and poorer academic performance. Similarly, Anwar and Marwan (2022) found a significant positive

relationship between social media use and academic procrastination, indicating that greater engagement with social networking platforms may contribute to delays in completing academic tasks.

General Procrastination and Technology Use

Previous studies have also explored broader behavioural factors associated with procrastination. Malik and Rafiq (2016) found that internet addiction was positively related to procrastination. Rozgonjuk et al. (2018) demonstrated that problematic smartphone use was associated with procrastination, with social media use acting as a mediating factor. Similarly, Ekşi et al. (2019) and Müller et al. (2020) highlighted the roles of self-control, fear of missing out, and problematic social networking in increasing procrastination behaviours.

Literature Gap

Although previous research suggests that social media use may contribute to procrastination, most studies have focused on general measures of social media use rather than specific patterns of engagement. In addition, findings regarding gender differences remain inconsistent. These gaps

indicate the need for further research examining different dimensions of social media use and their relationship with procrastination among college students.

Research Methodology

Research Design

The present study employed a quantitative, cross-sectional correlational research design to examine the relationship between social media use and procrastination habits among college students. A correlational design was chosen to determine whether a statistically significant relationship existed between the study variables without manipulating them.

Participants and Sampling

The study was conducted among college students in India using a purposive sampling technique. The final sample comprised **67 participants**, including **30 males (44.8%)** and **37 females (55.2%)**, aged between **18 and 30 years**. Participants were required to be active users of social media, currently enrolled in a college or university, and proficient in English. Individuals who did not use social media, were unwilling to

participate, or reported mental health conditions that could affect their responses were excluded from the study.

Table 1:

Demographic Characteristics of the Participants

GENDER	FREQUENCY	%
MALE	30	44.8%
FEMALE	37	55.2%
TOTAL	67	100.0%

Instruments

Data were collected using a socio-demographic questionnaire and two standardized psychological instruments. Social media use was assessed using the **Social Media Use Scale (SMUS)** developed by Tuck and Thompson (2023), which consists of 17 items measuring four dimensions of social media use: image-based, comparison-based, belief-based, and consumption-based activities. Responses are rated on a nine-point frequency scale, with higher scores indicating greater engagement in each dimension.

Procrastination was measured using the **General Procrastination Scale** developed by Lay (1986). The scale consists of 20 items rated on a five-point Likert scale and assesses

an individual's tendency to delay intended tasks. Higher total scores indicate higher levels of procrastination. Both instruments have demonstrated satisfactory reliability and validity in previous research.

Procedure

Ethical guidelines were followed throughout the study. Participants were informed about the purpose of the research before providing informed consent. Data were collected online through Google Forms containing demographic questions and the two standardized questionnaires. Participation was voluntary, and anonymity and confidentiality were maintained. After data collection, responses were entered into Microsoft Excel and analysed using PSPP statistical software.

Data Analysis

The collected data were analysed using PSPP. Descriptive statistics were computed to summarise participant characteristics and study variables. Independent samples *t*-tests were conducted to examine gender differences in social media use and procrastination, while Pearson's correlation analysis was performed to determine the relationship between the two variables.

Reliability analysis was also conducted to assess the internal consistency of the study instruments.

Analysis And Interpretation

Participant Characteristics

A total of 67 college students participated in the study, comprising 30 males (44.8%) and 37 females (55.2%). Participants were between 18 and 30 years of age and represented diverse educational, ethnic, religious, and geographical backgrounds.

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Table 1

Demographic Characteristics of the Participants

Gender	Frequency	Percentage (%)
Male	30	44.8
Female	37	55.2
Total	67	100.0

Descriptive Statistics

Descriptive statistics were computed to examine the distribution of social media use and procrastination among participants. The consumption-based dimension of the Social Media Use Scale recorded the highest mean score ($M = 17.84$, $SD = 7.20$), indicating that participants most frequently engaged in passive social media activities such as browsing content. The belief-based dimension showed the lowest mean score ($M = 5.00$, $SD = 2.48$). The overall mean score for procrastination was 60.18 ($SD = 8.59$), suggesting moderate levels of procrastination among the participants.

Table 2

Descriptive Statistics for Social Media Use and Procrastination

Variable	Mean	SD	Skewness	Kurtosis
SMUS (Image-Based)	8.98	4.27	1.13	0.89
SMUS (Comparison-Based)	6.89	4.55	1.33	1.22
SMUS (Belief-Based)	5.00	2.48	1.52	1.43
SMUS (Consumption-Based)	17.84	7.20	0.39	-0.53
Procrastination	60.18	8.59	-0.11	0.10

Gender Differences in Social Media Use and Procrastination

Independent samples t -tests were conducted to examine gender differences in social media use and procrastination. Female participants scored significantly higher than males on the comparison-based ($t = -2.20$, $p = .032$) and

consumption-based ($t = -2.52$, $p = .014$) dimensions of social media use. Therefore, the first null hypothesis was partially rejected, indicating that gender differences existed in specific dimensions of social media use. However, no statistically significant gender difference was observed in procrastination levels ($t = -0.64$, $p = .526$). Hence, the second null hypothesis was retained.

Table 3

Gender Differences in Social Media Use and Procrastination

Variable	Male Mean $\pm$ SD	Female Mean $\pm$ SD	t	df	p
Comparison-Based SMUS	5.57 $\pm$ 3.22	7.95 $\pm$ 5.20	-2.2 0	65	.032*
Consumption-Based SMUS	15.48 $\pm$ 6.89	19.76 $\pm$ 6.94	-2.5 2	65	.014*
Procrastination	59.43 $\pm$ 8.60	60.78 $\pm$ 8.65	-0.6 4	65	.526

Note. $p < .05$ indicates statistical significance.

Reliability Analysis

The reliability of the study instruments was assessed using Cronbach's alpha. The Social Media Use Scale (SMUS) demonstrated good internal consistency ($\alpha = .87$), while the General Procrastination Scale demonstrated acceptable internal consistency ($\alpha = .73$). These findings indicate that both

instruments were reliable for measuring the constructs in the present study.

Table 4

Reliability of the Study Instruments

Scale	Cronbach's α	Number of Items
Social Media Use Scale (SMUS)	.87	17
General Procrastination Scale	.73	20

Correlation Between Social Media Use and Procrastination

Pearson's correlation analysis was conducted to examine the relationship between the dimensions of social media use and procrastination. The results showed weak negative correlations for image-based ($r = -0.119$), comparison-based ($r = -0.082$), and belief-based ($r = -0.066$) social media use, whereas consumption-based social media use demonstrated a weak positive correlation ($r = 0.064$). None of these correlations were statistically significant. Therefore, the third null hypothesis, which stated that there was no significant relationship between social media use and procrastination habits among college students, was **retained**.

Table 5

Correlation Between Social Media Use and Procrastination

Variable	Pearson's r
SMUS (Image-Based)	-0.119
SMUS (Comparison-Based)	-0.082
SMUS (Belief-Based)	-0.066
SMUS (Consumption-Based)	0.064

Discussion

The present study examined the relationship between social media use and procrastination habits among college students and explored gender differences in both variables. Descriptive analysis indicated that participants reported the highest engagement in consumption-based social media use, whereas belief-based social media use was the least common. This suggests that students mainly use social media for passive activities rather than active engagement. These findings are consistent with previous research indicating that passive social media use is more common because it requires less effort and provides immediate access to personalised content (Kuss & Griffiths, 2017; Bakshy et al., 2015). The participants also reported moderate levels of procrastination, supporting earlier findings that

procrastination is a common behaviour among college students (Steel, 2007).

The findings further revealed significant gender differences in comparison-based and consumption-based social media use, with female participants reporting higher levels than males. This is consistent with previous studies suggesting that females are more likely to engage in social comparison and consume social media content for communication and social interaction (Vogel et al., 2014; Tifferet & Vilnai-Yavetz, 2018). However, no significant gender differences were found in procrastination, which is in line with previous research (Haycock et al., 1998; Johnson & Bloom, 1995).

Correlation analysis showed no statistically significant relationship between any dimension of social media use and procrastination. Although weak positive and negative correlations were observed, none reached statistical significance. These findings suggest that social media use alone may not predict procrastination among college students and that other factors, such as self-regulation, academic stress, and time management, may have a greater influence (Nwosu et al., 2020).

Major Findings

The study found that participants predominantly engaged in consumption-based social media activities, whereas belief-based activities were least common. Female participants reported significantly higher comparison-based and consumption-based social media use than males. However, no significant gender differences were observed in procrastination, and no significant relationship was found between social media use and procrastination. Both study instruments demonstrated satisfactory internal consistency.

Conclusion

Limitations

The study was conducted within a limited timeframe using a relatively small sample of 67 college students, which may limit the generalisability of the findings. The use of self-reported measures may also have introduced response bias, and the findings are limited to participants aged 18–30 years.

Suggestions for Future Research

Future research should include a larger and more diverse sample to improve the generalisability of the findings. Studies may

also examine additional psychological variables, such as self-control, academic stress, motivation, personality traits, and time management, to better understand factors associated with procrastination. Longitudinal and mixed-methods research could provide deeper insights into how social media use influences procrastination over time. Furthermore, cross-cultural studies and investigations of different patterns of social media engagement may contribute to a more comprehensive understanding of students' digital behaviours and their academic outcomes.

Conclusion

The present study examined the relationship between social media use and procrastination habits among college students in India. The findings indicated that participants predominantly engaged in consumption-based social media activities, while belief-based social media use was the least common. Significant gender differences were observed in comparison-based and consumption-based social media use, with female participants reporting higher levels of engagement than males. However, no significant gender differences were found in procrastination levels. Furthermore, the study

found no statistically significant relationship between social media use and procrastination, suggesting that social media use alone may not be a significant predictor of procrastination among college students.

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Yes, informed written consent was obtained from all participants.

5. Data Availability Statement:

The data that support the findings of this study are available upon reasonable request from the corresponding author.

6. Author Contributions (Credit Statement):

□ Author 1: Conceptualisation, Methodology, Writing – Original Draft

□ Author 2: Data Curation, Formal Analysis, Writing – Review & Editing

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Article

The Relationship Between Instagram Usage And Self Esteem

Article History

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Abstract

The use of social media is growing exponentially in today's society with Instagram being one of the fastest growing social media platforms. Due to its growing influence, instagram has become one of the essential parts of one's daily routine. The present study was undertaken to understand the relationship between instagram usage and self-esteem. A sample of 81 participants were included in the research on the basis of convenient sampling. The study used two standardized scales such as Rosenberg self-esteem scale and The Instagram Addiction Scale. Based on the findings of the study, it was concluded that there was a significant positive relationship between instagram use and self-esteem.

Keywords:

social media, Instagram, self-esteem

Introduction

The emergence of digital and mobile technologies has facilitated widespread interaction for individuals, ushering in a new

era in media where interactivity assumes a central role in its function (Manning, J., 2014).

1.1 Social Media

Social media refers to electronic platform enabling users to engage with others, freely share various content such as text, images, and videos, exchange information, ideas, and personal messages, and discuss a wide range of topics pertaining to their lives and interest. Social media encompasses various online platforms designed for community engagement, user interaction, content dissemination and collaborative efforts.

In the course of the last decade, it has been observed that social media has become as essential part of an individual's routine. It has brought about a shift in the mode of communication that we share with one another.

1.2 Instagram

With the rise in the use of social media, Instagram which is one of the most popular social networking platforms is an app that promotes interaction among its users by allowing them to share their photos and

videos as well as post stories to update their followers about their activities.

Currently, there are 2 billion active users on instagram with 358.55 million users in India. It has also been found that people spend 29.7 minutes on an average daily on instagram. It

has been noted that 71% of users who have active accounts are in the age group of 18-29 (Brian Dean 2024)

It has also been suggested that instagram is most popular among adolescents and young adults who in majority access their profile at least once in a day (Pew Research Centre,2019).

1.3 Self-Esteem

Self-esteem is the attitude and view that one has towards to their own self be it in a negative or positive regard (Rosenberg, 1965).

Self-esteem plays a crucial role in influencing decision-making, interpersonal connections, emotional wellness, and general quality of life. Additionally, it serves as a driving force, encouraging individuals with robust self-esteem to maintain a positive self-perception, recognize their capabilities, embrace new opportunities, cultivate healthy

relationships, set realistic expectations and effectively communicate their needs and desires.

1.4 Instagram and Self-Esteem

In instagram, people post images which are enhanced and beautified with various filters and editing, which leads to unrealistic beauty standards making one seek validation from their peers resulting in lower self-esteem (Chua & Chang, 2016).

Instagram often leads people to compare their own lives with others best highlighted deceptive versions of their life, which results in lower self-esteem among the users (Marisa Peer, 2020).

Instagram has developed into a venue for judgements and personality comparisons in society (de Vries et al., 2018; Sherlock & Wagstaff, 2018)

Review Of Literature

2.1 Literature Review

Jiang & Ngien (2020) conducted a study in Singapore to determine the effect of instagram usage on a person's social anxiety, where an online survey study was conducted on 388 participants. In the result, it indicated that instagram usage did not precisely give

rise to social anxiety, instead it was found that its impact was conciliated by social comparison and self-esteem.

Paramboukis, et al., (2016) sparked by unverified media assertions that excessive use of social media is contributing to an increase in narcissism, conducted an exploratory the study to investigate the connections between narcissism, self-esteem and instagram usage. As part of the study, 200 participants completed an online survey. In their findings, they arrived at a conclusion that there was only a little data to support the claims made by the media on the associations between narcissism and instagram use however, the findings suggest a nuanced link between narcissism and self-esteem, indicating that vulnerable narcissism shows a negative correlation with self-esteem, while grandiose narcissism demonstrates a positive albeit weaker association with self-esteem. Vulnerable narcissists tend to be more inclined towards seeking validation and being particularly responsive to feedback on their post while grandiose narcissist utilize instagram to showcase their superiority without being excessively sensitive to feedback.

Pecino & Gavilán (2019) conducted a similar study in south of Spain among 244 participants who were secondary students. The aim of the research was to investigate the impact of likes and self-esteem on excessive instagram usage and exploring how self-esteem moderates the connection between likes and such excessive usage on the platform. Based on their findings, they arrived at a conclusion that self-esteem acts as a protector that allows one to view the relevance of likes objectively rather than indulging on problematic usage while opening the gateway for reaping benefits off social network use.

Another similar study conducted by Mackson et al., (2019) investigated the relationship between social media application and the user's psychological wellbeing. The survey which was completed by 204 participants aimed to investigate the association shared between instagram usage and the individual's psychological wellbeing as well as factors that are linked with users report of anxiety and depression. Based on the result, they came to a conclusion that social media is not bad rather one's psychological wellbeing depends on the way one makes use of the media.

Another study was conducted by Ardiana & Tumanggor (2020) on 'Social Media Instagram Addiction and Self-Esteem in High School Students' to understand the relationship between self-esteem and instagram social media addiction among high school students. The study was carried out among 87 high school students aged between 15-18 in Jakarta. The results indicated that higher self-esteem was found among students who had higher media addiction while lower self-esteem was found among people who had lower media addiction.

A study on Pakistani young adults was conducted to investigate 'Social-media Usage, Self-Esteem and Self-concept in Young Adults' by Hassan & Afzal (2022). The research collected a sample of 100 university students. Based on their findings, they arrived at the conclusion that the social media played the role of predictor in 'one's self-esteem, self-concept and positive-negative effects'.

Another similar was carried out by Hawi & Samaha (2016) to investigate the relation between social media on one's self-esteem and contentment. They came to the conclusion that social media is inversely related to self-esteem and indirectly affects

life satisfaction through this negative relationship.

Mayukh & Manaf (2022) carried out a study in Malaysia during the COVID-19 pandemic among young adults to determine the association between 'Instagram usage, social comparison, and self-esteem'. The research was conducted among 200 university students. The result indicated that though there were active users, there was little correlation found between instagram use, social comparison and self-esteem.

A study conducted by Trifiro (2018), investigated the pattern of social media usage and its relationship with one's self-esteem and well-being. The results indicated that the level of engagement, rather than specific usage patterns, dictate user's outcome. Ultimately, individuals who extensively interact with instagram tend to demonstrate elevated levels of self-esteem and well-being compared to those who use the platform less frequently.

Guyen (2019) conducted a study in the United States among the University students to investigate the relationship between 'usage of social media and self-esteem, and social media and satisfaction with life'. It was

revealed that engaging in social media is associated with predicting levels of self-esteem, negative emotions and positive emotions. However, no significant correlation was identified between social media usage and life satisfaction.

2.2 Literature Gap

Review of literature provides important insights into how social media such as Instagram intersects with mental-wellbeing. However, the studies did not delve particularly into instagram usage and self-esteem. So, this research aims to address the relationship between Instagram use and self-esteem by taking into variables such as Instagram Feed and Instagram Story and their relationship with one's self-esteem into account.

2.3 Rationale of the Study

Instagram being one of the most widely used social media platforms worldwide, has revolutionized interpersonal communication and altered how individuals view themselves and others. Recognizing the significance of comprehending instagram's potential effect on self-esteem is vital owing to its extensive influence over how users perceive beauty, achievement and societal validation. This

study tries to understand the relationship between Instagram usage and its influence on the user's self-esteem.

Instagram offers a curated perception into people's lives, often presenting polished representations of reality with meticulously edited posts and filters. These selective presentations can foster unrealistic beauty standards and lifestyles often leading the viewers to unfavorably compare themselves to others. The pursuit of seeking validation through engagements such as likes, comments and follow can lead to individuals seeking external validations to re-affirm their self-esteem. It has been noted that instagram users often experience the phenomenon of Fear Of Missing Out when they compare their lives with others seemingly exciting and fulfilling experiences often leading to them feeling inadequate and lower self-esteem as they view themselves falling short to the standards of happiness and success on the media.

2.4 Statement of the Problem

In this modern society where technology is advancing every day and social media is easily accessible to all the individuals belonging from different corners of the

world, the influence of instagram is ever growing. Instagram which has become a vital part of one's daily routine, not only provides entertainment but is also one of the contributing factors to lower self-esteem among the users. People who are constantly exposed to the curated feeds on the platform are under the pressure to meet the societal beauty standards set on the media. The users also feel that the lives that they are living is not exciting and fruitful like others making them feel inadequate about themselves. Most often people fail to realize that the feed that they engaging with only shows them a glimpse of their life and what they see on the media is not always the reality, leading people to become insecure about themselves which in turns hampers their self-esteem.

2.5 Aim of the Study

The study seeks to address the relationship between instagram usage and self-esteem to get a deeper insight on the psychological implications of social media engagement and also if there is any difference with respect to gender.

2.6 Research Questions

1. Is there any significant relationship between instagram feed and instagram story?

2. Is there any significant relationship between instagram feed and self-esteem?

3. Is there any significant relationship between self-esteem and instagram story?

4. Is there any significant difference between the 2 study groups (male and female) with respect to instagram feed?

5. Is there any significant difference between the 2 study groups (male and female) with respect to instagram story?

6. Is there any significant difference between the 2 study groups (male and female) with respect to self-esteem?

2.7 Objectives of the study

1. To study if there is any significant relationship between instagram feed, instagram story and self-esteem.

2. To study if there is any significant difference between the 2 study groups (male and female) with respect to instagram feed, instagram story and self-esteem.

2.8 Hypothesis

2.8.1 Ho

Ho1 There will be no significant relationship between instagram feed and instagram story

Ho2 There will be no significant relationship between instagram feed and self-esteem

Ho3 There will be no significant relationship between self-esteem and instagram story

Ho4 There will be no significant difference between the 2 study groups (male and female) with respect to self-esteem.

Ho5 There will be no significant difference between the 2 study groups (male and female) with respect to instagram feed.

Ho6 There will be no significant difference between the 2 study groups (male and female) with respect to instagram story.

2.8.2 Ha

H1 There will be a significant relationship between instagram feed and instagram story

H2 There will be a significant relationship between instagram feed and self-esteem

H3 There will be a significant relationship between self-esteem and instagram story

H4 There will be a significant difference between the 2 study groups (male and female) with respect to self-esteem

H5 There will be a significant difference between the 2 study groups (male and female) with respect to instagram feed.

H6 There will be a significant difference between the 2 study groups (male and female) with respect to instagram story.

2.9 Operational Definitions

□ Self-esteem: Self-esteem refers the perception that one holds towards their own self which can either be in a positive or negative view. (Rosenberg, 1965)

□ The Instagram Addiction Scale: The Instagram Addiction Scale (TIAS) measures addictive behavior towards the platform among the users. The scale consists of two subscales: Instagram Feed Addiction and Instagram Stories Addiction. (Sholeh & Rusdi, 2019)

Research Methodology

3.1 Research design

A quantitative research approach was employed in this study. Correlational study design was used keeping in mind the objectives of the study.

3.2 Sample

The population of the study consisted participants between the ages of 18 to 30 years. The sample consisted of 81 participants; 34 male and 47 female

participants. A convenience sampling method was employed in the present study.

3.3 Inclusion criteria

- Participants between the age of 18-30 years
- Participants who use Instagram
- Participants that understand English

3.4 Exclusion criteria

- Participants who provided incomplete data
- Participants with significant current and medical/psychiatric illness
- Participants with significant/psychiatric history

3.5 Variables

- Independent variable: Instagram feed and Instagram story
- Dependent variable: Self-Esteem

3.6 Measures

3.6.1 Socio-demographic Data Sheet

For the purpose of the present study socio-demographic information was enquired from the participants. The information included name or initials, gender, age and educational qualification.

3.6.2 Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale was developed by Morris Rosenberg in 1965. It is used in order to measure self-esteem levels among respondents. The participants reported their response on the 10 statements based on 4- point Likert scale ranging from 1(strongly disagree) to 4(strongly agree) where 5 items were reverse coded. The items included statements such as, “On the whole, I am satisfied with myself” and “I feel I do not have much to be proud of” (reversed coded). The Cronbach’s alpha was 0.709.

3.6.3 The Instagram Addiction Scale (TIAS)

The Instagram Addiction Scale was developed by Sholeh, A., & Rusdi, A. (2019). It is used to measure the levels of instagram addiction among the users. It consists of two scales, Instagram Feed Addiction Scale and Instagram Stories Addiction Scale in which both scales consist of 6 items. Both the scales have items such as salience, mood modification, tolerance, withdrawal, conflicts and relapse representing addiction components. The scale is based on 5-point Likert scale ranging from 1 (strongly agree)

to 5 (strongly disagree). The Cronbach’s alpha was .88.

3.7 Procedure

Before the questionnaire was sent, the participants were given a briefing regarding the purpose of the study and instructions to be followed regarding the questionnaire. Data was collected with consent from all the participants. They were ensured that their responses would remain anonymous and confidential and would be used purely for academic purposes. Data was gathered through online mode using Google Forms.

In the present study, a sample of 81 responses were taken into consideration. 34 males and 47 female participants, selected on the basis of the inclusion and exclusion criteria. Consent was obtained from all participants and the nature of the research was explained.

Phase 1:

- The research problem was identified
- Existing literature related to the present study was reviewed.

Phase 2:

- Convenience sampling was used

•Consent and information schedule were given to those participants who fulfilled the inclusion and exclusion criteria

•Participants who consciously agreed to participate in the present study were included and the rest were excluded.

•Data was gathered through online mode using Google Forms where participants were given 2 assessment scales.

Phase 3:

•After the data was collected, the scales were scored

•The necessary statistical analysis was performed which included mean, standard deviation, spearman's rank-order correlation coefficient and T-Test.

•The results were represented in tables and finally discussed.

3.8 Data analysis

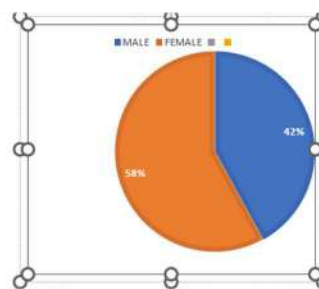
The data was analyzed using IBM SPSS Statistics 26. Pearson correlation coefficient and T-Test was performed to assess the relationship between instagram usage and self-esteem.

Frequencies, mean and standard deviations were calculated to summarize demographic data, self-esteem, and instagram addiction.

RESULTS

Table 1 Gender

	Frequency	%
Male	34	42.0
Female	47	58.0
	81	100.0



The study was conducted among 81 respondents with 34 male (42%) and 47 females (58%).

Table 2 Mean, Median, Mode and Standard Deviation

	Self-Esteem	Instagram Feed	Instagram Story
Mean	23.98	15.62	15.39
Median	24.00	16.00	15.00
Mode	23.00	16.00	15.00
Standard Deviation	4.00	4.88	5.517

The mean and standard deviation for the population is shown in the table 2.

Table 3 Mean of the two study groups

	Gender	N	Mean
Self-esteem	Male	34	22.79
	Female	47	24.85
Instagram Feed	Male	34	14.73
	Female	47	16.27
Instagram Story	Male	34	13.88
	Female	47	16.48

Table 4 T-Test of the two study groups

	T	Df	Sig.(2-tailed)
Self-esteem	-2.43	78.11	.017
Instagram feed	-1.40	70.62	.164
Instagram story	-2.16	73.48	.034

Table 4 reports that female [M= 24.85, SD=4.22] had significantly greater self-esteem than male [M=22.79, SD=3.38], $t = (-2.43) = 78.11$, $p = (.017)$. Therefore, H4 was accepted.

Further the results from table 4 indicate that there was no significant difference between the instagram feed of female [M=16.27, SD=4.89] and male [M=14.73, SD=4.82], $t = (-1.40) = 70.62$, $p = (.164)$. Therefore, H05 was accepted.

Further the results from table 4 indicate that female [M=16.27, SD=4.89] had significantly greater instagram feed than male [M=14.73, SD=4.82], $t = (-1.40) = 70.62$, $p = (.164)$. Therefore, was accepted.

Table 4 results indicate that female [M= 16.48, SD= 5.52] had significantly greater instagram story than male [M=13.88, SD=5.22], $t = (-2.16) = 73.48$, $p = (.034)$. Therefore, H6 was accepted.

Table 5 Pearson Correlation of Self-esteem, Instagram feed and Instagram Story

	1	2	3
Self-esteem	-		
Instagram Feed	.336**	-	
Instagram story	.339**	.881**	-

** $p < 0.01$ (2-tailed)

A Pearson correlation coefficient was performed to evaluate the relationship between the self-esteem and instagram feed. Based on table 5, there was a significant weak positive relationship between self-esteem and instagram feed, ($r = .336$, $p < 0.01$). Therefore, H2 was accepted.

For the self-esteem and instagram story based on table 5 there was a significant weak positive relationship between self-esteem and instagram feed, ($r = .339$, $p < 0.01$). Therefore, H3 was accepted.

Further, table 5 shows that there was a significant strong relationship between instagram feed and instagram story, ($r = .881$, $p < 0.01$). Therefore, H1 was accepted.

Discussion

In this present study, it establishes that there is a significant positive relationship between the scores for instagram feed and self-esteem. Ellison et al (2007) shows that people actively engaged in social media show positive outcomes as user since they feel a

sense of connection with their online community. Trifiro & Prena (2021) through their study found that people who use social media such as instagram showed higher levels of self-esteem. As social media provides a platform where individuals can meet like-minded people and gather information, it leads to an individual having an increased level of self-worth as they feel a sense of belongingness and connection with their peers (Verduyn et al 2017).

Through the findings of the study, we can establish that the scores for instagram story and self-esteem share a positive correlation albeit weak. Instagram provides a platform where individuals can express themselves and connect with friends and other like-minded people all across the world. Through positive encouragements and engagements in the platform it can boost one's self-esteem as they get a sense of belongingness in the community which can be backed by the work of Radovic et al (2017) which states that by browsing on the platform for positive content, users can feel enjoyment as well as feelings of support.

The study has also established that there is no significant difference among the male and female in terms of instagram feed

engagement which aligns with the work of Rousseau and Puttaraju (2014) which stated that in social media addiction, there are no significant differences among male and female.

However, it was found that there was significant difference among the male and female in regard to their self-esteem which can also be seen in the study conducted by Sherlock and Wagstaff (2018) where it has been found that among women the issues of low self-esteem, general and appearance anxiety is associated with time spent on instagram.

5.1 Conclusion

With the increasing popularity of instagram and it being one of the fastest growing platforms, it is causing concern among people especially in regard to its association with the user's self-esteem. However, one should understand that instagram is not always negatively related to one's view towards themselves.

The current study was conducted among the adults to and through the findings it suggests

that there is a significant positive relationship shared between instagram usage and self-esteem. Through the results, we can conclude that frequent interactions on the platform can be associated with heightened levels of self-esteem.

5.2 Implications

The study provides further evidence to establish a relationship between instagram usage and self-esteem. It informs about the influence of instagram and the role it performs in shaping individual's self-perception. The psychologists or educators can understand this relationship to address mental health concerns in the digital age.

The present study revealed that instagram can be beneficial to one's self-esteem however this do not neglect the fact that some people do suffer by virtue of instagram and it is vital to understand the phenomenon better. Thus, instagram should be addressed through awareness and with future interventions for people whose suffering is associated with the use of instagram.

The research findings can also be implemented in daily life. The key is in raising awareness that can be launched in universities, schools and families about

media literacy and target students or individuals with low self-esteem or those addicted to social media.

5.3 Limitations and future directions

1. The present study was conducted utilizing an online survey. As a result, participants may have been exposed to distractions and may not have answered questions honestly. Future research conducted online may include an instructional manipulation check to detect participants who are not following instructions.

2. While correlation provide useful information regarding associations between instagram use and several psychological constructs, they cannot provide information regarding causal relationships between the variables.

3. The study was conducted on a small population. For future studies, it should be conducted with larger number of participants to provide maximum results from the research.

4. The data for the study was obtained through self-report, so there is a possibility for human error. For future studies, it can

employ a combination of self-report measures and objective measures.

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2. Conflict of Interest Statement:

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5. Data Availability Statement:

The data that support the findings of this study are available upon reasonable request from the corresponding author.

6. Author Contributions (Credit Statement):

□ Author 1: Conceptualisation, Methodology, Writing – Original Draft

□ Author 2: Data Curation, Formal Analysis, Writing – Review & Editing

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Appendix Rosenberg Self-Esteem Scale

strongly agree - 1

agree – 2

disagree - 3

strongly disagree - 4

1. On the whole, I am satisfied with myself.
2. At times I think I am no good at all.
3. I feel that I have a number of good qualities.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.
6. I certainly feel useless at times.
7. I feel that I'm a person of worth
8. I wish I could have more respect for myself.
9. All in all, I am inclined to think that I am a failure.
10. I take a positive attitude towards myself.

The Instagram Addiction Scale (TIAS)

All scale here used 5-point Likert scale ranged from "strongly disagree", "disagree", "neither agree nor disagree", "agree", "strongly agree". The minimum score possible for each question is 1, and the maximum is 5.

Component	Instagram feed
Salience	I often think about what is happening on Instagram when I do not access it.
Tolerance	I post photos/ videos on Instagram feed to attract others' attention'
Mood Modification	I see the contents of Instagram feed posts to reduce feelings of guilt, anxiety, helplessness, or depression.
Relapse	I try to limit my time for Instagram (see the feed), but it does not work.
Withdrawal	I get easily irritated if I am prohibited from seeing the Instagram feed.
Conflict	I find it hard to share time for hobbies, rest, or exercise because I spend my time checking Instagram feed.

A total score of IFA-6 is calculated by adding up each item score (ranging from 6-30). The higher the score, the greater the Addiction on Instagram Feed.

Component	Instagram story
Salience	I think before sharing a photo on Instagram Stories whether to share it to public or close friends
Tolerance	I make Instagram stories about my activities to get others' attention
Mood Modification	I check the content of Instagram stories to reduce feelings of guilt, anxiety, helplessness, or depression.
Relapse	I check the content of Instagram stories to reduce feelings of guilt, anxiety, helplessness, or depression.
Withdrawal	I get irritated easily if I am prohibited from watching Instagram stories.
Conflict	I watch Instagram stories too much that I neglect work/lectures/study time.

Article

Behaviour Correlates of Sleep Quality and Social Media Addiction Implication for Academic Performance Emerging Adults

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<http://creativecommons.org/licenses/by/4.0>**Abstract:**

The rapid growth of social media has significantly influenced the daily behaviours of young adults. While these platforms offer benefits such as communication and academic collaboration, excessive use has been linked to negative psychological and academic outcomes. Social media addiction (SMA) is increasingly associated with poor sleep quality, emotional disturbances, and reduced cognitive functioning, all of which affect academic performance. Emerging adults, especially undergraduate students, are particularly vulnerable due to their high dependence on digital technologies.

The present study examines the relationship between social media addiction, sleep quality, and academic performance among emerging adults. Using a quantitative design, data were collected through standardized self-report measures assessing social media use, sleep patterns, and academic functioning. The study aims to analyse how social media addiction relates to sleep quality and how both variables influence academic performance.

Findings revealed that higher levels of social media addiction are associated with poorer sleep quality, including delayed sleep onset and increased fatigue. Poor sleep, in turn, negatively impacts concentration, motivation, and academic performance. Overall, the study highlights the importance of promoting balanced digital usage and healthy sleep practices to enhance academic outcomes among students.

Keywords: *Social Media Addiction, Sleep Quality, Academic Performance, Emerging Adults, Digital Behaviour.*

INTRODUCTION

1.1 Introduction

“Sleep is the single most effective thing we can do to reset our brain and body health.”

-Matthew Walker

Sleep is widely recognized as a fundamental component of human health, often considered alongside diet and exercise as a key pillar of well-being (National Institutes of Health, as cited in Gangwisch et al., 2006). It plays an essential role in maintaining physical health, regulating hormones, and supporting cognitive functions such as memory, attention, and learning (Banks &

Dinges, 2007; Bixler, 2009). However, sleep quality is a complex and multidimensional concept that varies across individuals and life stages. In today’s digital era, rapid technological advancements and increased access to smartphones and the internet have significantly altered daily routines, especially among emerging adults. A large proportion of young people actively engage in social media on a daily basis (Pew Research Center, 2016; Yang et al., 2017), often at the cost of their sleep. Excessive use of social media, commonly referred to as social media addiction (SMA), has been consistently linked with poor sleep quality and declining academic performance (Al-Garni et al., 2024; Zhu et al., 2023).

From a behavioural perspective, the relationship between sleep quality, social media addiction, and academic performance forms a continuous cycle in the lives of emerging adults. Increased social media use, particularly during late-night hours, disrupts sleep patterns, leading to fatigue, reduced concentration, and lower academic efficiency. Poor academic performance and stress may further push students to rely on social media as a form of escape or emotional coping, reinforcing addictive behaviours

(Twenge et al., 2018). As highlighted by Walker (2017), insufficient sleep directly affects learning and memory processes, making it difficult for students to perform well academically. In real-life contexts, many students struggle to balance academic responsibilities with digital engagement, often sacrificing sleep without fully understanding its long-term consequences. Therefore, examining these behavioural correlates is crucial to understanding how healthier sleep habits and responsible social media use can improve both academic performance and overall well-being among emerging adults.

1.2 Background

The rapid integration of social media into the daily lives of young adults has generated increasing concern regarding its implications for cognitive, emotional, and academic functioning. Social media addiction (SMA), characterized by excessive and compulsive use, has been linked to impaired self-regulation, emotional dysregulation, and disrupted sleep patterns factors critical to executive functioning and learning efficiency. Emerging evidence suggests that while moderate social media use may support information access and academic

engagement, excessive use often results in distraction, cognitive overload, and declining academic outcomes, particularly among high-risk student populations.

Recent international research has emphasized the role of executive functioning as a key cognitive domain affected by SMA, with emotional disturbance and sleep quality acting as important mediating mechanisms. Emotional dysregulation associated with problematic social media use can heighten anxiety, depression, and stress, which in turn negatively influence cognitive control and decision-making abilities. Concurrently, bedtime social media engagement exposes users to blue light and emotionally arousing content, delaying sleep onset, reducing sleep efficiency, and impairing circadian regulation. These sleep disruptions have been consistently associated with diminished attention, working memory, and academic motivation.

Indian studies further contextualize these concerns by demonstrating strong associations between excessive social media use, psychological distress, sleep fragmentation, and reduced academic performance among undergraduate and postgraduate students. Although some

research has begun integrating physiological indicators such as heart rate variability and blood pressure, much of the existing literature relies on self-report measures and cross-sectional designs, limiting causal inference. Collectively, these findings highlight a cascading pathway in which SMA contributes to emotional and sleep-related disturbances, ultimately impairing cognitive and academic functioning. This background underscores the need for integrative models examining emotional and sleep-related mediators to better understand the broader cognitive consequences of social media addiction among emerging adults

1.3 Theoretical Framework

Social Comparison Theory explains that individuals naturally evaluate themselves by comparing with others. In the context of social media use, students are constantly exposed to idealized images of peers and influencers, which leads to upward comparisons. This continuous comparison increases emotional engagement, feelings of inadequacy, and prolonged screen time, especially during late hours. As seen in studies like Vogel et al. (2014), such comparison-driven engagement contributes to anxiety and delayed sleep, indirectly

affecting concentration and academic performance. In real life, students may scroll through social media at night, comparing their lives with others, which reduces sleep time and impacts next-day academic functioning.

Cognitive Behavioural Theory suggests that thoughts influence behaviours and emotional outcomes. In the case of social media addiction, students may develop maladaptive thought patterns such as fear of missing out (FOMO) or the need for constant validation. These thoughts reinforce compulsive checking behaviours, even during study time or before sleep. According to Przybylski et al. (2013), such patterns increase distraction and reduce academic focus. In everyday situations, a student who feels anxious about missing updates may repeatedly check their phone, leading to poor sleep quality and decreased academic efficiency.

Arousal Theory explains that increased mental and physiological stimulation can interfere with sleep. Social media platforms are designed to provide continuous stimulation through notifications, videos, and interactive content. This keeps the brain in an alert state, making it difficult to relax and fall asleep. Research by Cain and Gradisar (2010)

supports that screen exposure before bedtime disrupts sleep patterns. In real-life context, students often use their phones late at night, which keeps their mind active and delays sleep onset, resulting in fatigue and reduced academic performance the next day.

Uses and Gratifications Theory suggests that individuals actively use media to fulfill psychological needs such as entertainment, social interaction, and stress relief. While social media may initially serve as a coping tool, excessive reliance can lead to overuse and dependency. As highlighted by Kuss and Griffiths (2017), this pattern can interfere with daily responsibilities, including academic tasks. In a real-world setting, students may turn to social media to relax after studying, but prolonged use can reduce study time, disrupt sleep, and negatively impact academic outcomes. The Behavioral Model of Sleep emphasizes the importance of consistent sleep routines and healthy habits for maintaining good sleep quality. Irregular behaviours such as late-night screen use, inconsistent sleep schedules, and mental stimulation before bedtime disrupt natural sleep cycles. According to Walker (2017), poor sleep hygiene directly affects memory, attention, and learning capacity. In everyday

life, students who use social media late at night often experience poor sleep quality, which reduces their ability to focus, retain information, and perform well academically.

1.4 Rationale

In today's digital age, social media has become an inseparable part of students' daily lives, especially among emerging adults. While it offers opportunities for communication, learning, and entertainment, its excessive use has raised growing concerns about its impact on health and academic functioning. Many students report spending late-night hours on platforms such as Instagram, WhatsApp, and YouTube, often at the cost of their sleep. This behavioural pattern reflects not just a habit, but a deeper psychological engagement driven by comparison, emotional needs, and difficulty in self-control. As a result, students frequently experience poor sleep quality, daytime fatigue, and reduced concentration in academic settings.

From a human perspective, this issue is highly relevant because it affects everyday student life. A student who intends to study may get distracted by notifications, continue scrolling due to fear of missing out, and

eventually delay sleep. The next day, lack of rest leads to tiredness, lower attention span, and reduced academic efficiency. Although previous theories such as Social Comparison Theory, Cognitive Behavioural Theory, and Self-Regulation Theory explain these behaviours, there is still a need to understand how these factors interact in real-life contexts, particularly among Indian students. Moreover, existing research often examines sleep, social media use, or academic performance separately, rather than exploring their combined effect.

Therefore, the present study is important as it attempts to bridge this gap by examining the behavioural relationship between social media addiction, sleep quality, and academic performance. Understanding this relationship can help in developing practical strategies for students to manage their digital habits, improve sleep hygiene, and enhance academic outcomes. It also provides valuable insights for educators, parents, and mental health professionals to support students in maintaining a healthy balance between technology use and daily functioning.

1.5 Research Gap

Lack of integrated approach. Most previous studies (e.g., Zhang et al., 2023; Levenson et al., 2017) have examined social media addiction, sleep quality, and psychological outcomes separately or in partial combinations. Very few studies have simultaneously explored the combined effect of social media addiction and sleep quality on academic performance. In real-life contexts, students experience these factors together (e.g., late-night scrolling affecting sleep and next-day learning), yet research has not adequately captured this integrated behavioural relationship.

Limited focus on academic performance. While many studies highlight the impact of social media on sleep and mental health, fewer studies directly examine its implications for academic performance. Even when academic outcomes are considered, they are often indirect or secondary variables. There is a need to understand how these behavioural factors translate into actual academic functioning in everyday student life.

Over-Reliance on Cross-Sectional and Self-Report Data. Most studies (e.g., Distor et al., 2022; Kumari & Thomas, 2021) rely on cross-sectional designs and self-reported

measures, limiting causal interpretation and accuracy. Students may underreport or overestimate their social media usage and sleep habits. There is a gap in capturing real behavioural patterns as experienced in daily routines.

Limited Exploration of Behavioural Mechanisms. Although some studies (e.g., Zhang et al., 2023) examine mediators like emotional disturbance, there is still limited understanding of day-to-day behavioural mechanisms, such as late-night scrolling, distraction during study, and poor time management. Research often focuses on statistical relationships rather than real-life behavioural patterns experienced by students.

Neglect of Self-Regulation and Lifestyle Factors. Few studies deeply explore the role of self-regulation, habits, and lifestyle choices in managing social media use and sleep. In reality, students struggle with controlling screen time, which directly affects both sleep and academic productivity. This gap highlights the need to examine behavioural control in a practical context.

1.6 Research Objectives

1. To examine the relationship between social media addiction and sleep quality among emerging adults.
2. To assess the relationship between sleep quality and academic performance among students.
3. To determine the predictive role of social media addiction and sleep quality on academic performance.

CHAPTER - 02

REVIEW OF LITERATURE

Durán-Vinagre et al. (2026) examined the relationship between social media use, sleep quality, anxiety, and executive functioning among university students in Spain (N = 586) using a quantitative associative design. Standardized tools (HARS and EFECO) were used to assess psychological and cognitive variables. The findings showed that increased social media use and poor sleep quality were significantly associated with higher anxiety and executive functioning difficulties, leading to reduced academic efficiency. Demographic factors such as gender and living conditions also influenced these relationships. Despite limitations including convenience sampling and cross-sectional design, the study provides strong evidence

for the interconnected effects of social media use, sleep disruption, and psychological functioning on academic performance.

Zhang et al. (2023) examined the relationship between social media addiction (SMA), emotional disturbance, sleep quality, and executive functioning among Chinese young adults ($N = 1,051$). Using standardized measures (BSMAS, DASS-21, PSQI, and Webexec) and structural equation modeling, the study found that higher SMA was associated with increased emotional disturbance, poorer sleep quality, and reduced executive functioning. Emotional disturbance significantly mediated the relationship between SMA and cognitive functioning, both independently and through sleep quality. Although the direct link between SMA and sleep was weaker, indirect pathways highlighted complex behavioural mechanisms. Despite limitations such as self-report bias and cross-sectional design, the study provides strong evidence for the interconnected effects of social media use, sleep disruption, and cognitive impairment.

Distor et al. (2022) examined the relationship between social media usage and sleep quality among freshman college students in the Philippines ($N = 385$) using a descriptive-

correlational design. Standardized tools (SMAS and PSQI) were used for assessment. The findings showed a significant positive relationship between social media use and poor sleep quality ($r = .283$, $p < .01$), indicating that higher usage is associated with disrupted sleep patterns. Excessive use, particularly before bedtime, was linked to delayed sleep onset and reduced sleep duration due to cognitive stimulation and blue light exposure. Despite limitations such as self-report bias, cross-sectional design, and limited generalizability, the study provides strong evidence for the behavioural link between social media use and sleep disturbances among students.

Kumari and Thomas (2021) assessed the associations between problematic SM use, psychological distress, and academic fatigue among young adults in South India. Drawing from the Compensatory Internet Use Theory, the researchers highlighted how excessive SM consumption serves as a coping mechanism for stress but paradoxically increases depression, anxiety, and stress symptoms. The sample ($N = 428$) exhibited high levels of bedtime rumination mediated through SM dependency. While the findings underline a strong connection between SM

habits and mental health deterioration, the study relied solely on self-reported psychometric tools, reducing objective accuracy.

Garett et al. (2018) examined the relationship between social media use and sleep quality among first-year university students ($N = 197$) using a 10-week longitudinal design. Social media behavior was objectively measured through Twitter activity, while sleep quality was assessed באמצעות weekly self-reports. The findings showed that increased late-night social media use on weekdays was significantly associated with poorer sleep quality and delayed sleep onset. In contrast, moderate evening use was linked to better sleep, highlighting the importance of usage timing over duration. Additionally, emotionally negative content (e.g., fear-related tweets) was associated with poorer sleep, emphasizing the role of emotional arousal. Despite limitations such as reliance on a single platform and self-reported sleep data, the study provides strong evidence for the impact of social media usage patterns on sleep quality among emerging adults.

Levenson et al. (2017) examined the association between social media use and sleep quality among young adults in the

United States ($N = 1,788$) using a cross-sectional design. Social media use was measured by frequency and duration, and sleep quality was assessed using the PSQI. The findings revealed a strong and significant relationship between high social media use and poor sleep quality, including delayed sleep onset and reduced sleep duration. Frequent checking emerged as a stronger predictor than total time spent, highlighting compulsive usage patterns. The study attributes these effects to cognitive arousal and screen exposure disrupting circadian rhythms. Despite limitations such as self-report measures and lack of causal inference, the study provides strong evidence linking social media engagement with sleep disturbances.

CHAPTER 3

METHODOLOGY

3.1 Aim of the Study

The primary aim of the present study is to examine the behavioural correlates of sleep quality and social media addiction and their influence on academic performance among emerging adults. Specifically, the study seeks to determine whether sleep quality and social media addiction significantly relate to and

predict academic performance among undergraduate students.

3.2 Objectives of the Study

The objectives of the study are as follows:

1. To assess the level of social media addiction among emerging adults using the Bergen Social Media Addiction Scale (BSMAS).
2. To assess the level of sleep quality among emerging adults using the Pittsburgh Sleep Quality Index (PSQI).
3. To evaluate the level of academic performance among students.
4. To examine the relationship between social media addiction, sleep quality, and academic performance.
5. To determine whether social media addiction and sleep quality significantly predict academic performance.

3.3 Research Design

The present study adopted a quantitative, cross-sectional, correlational research design to examine the relationship between social media addiction, sleep quality, and academic performance among emerging adults. A quantitative approach was considered

appropriate as the study aimed to measure behavioural and psychological variables using standardized instruments and to statistically analyse relationships between them (Creswell, 2014).

Correlation analysis was used to examine the relationships among variables, while regression analysis was conducted to determine the predictive role of social media addiction and sleep quality on academic performance. The cross-sectional design allowed data to be collected at a single point in time, reflecting participants' current behavioural patterns.

3.4 Variables of the Study

Independent variables (IV).

- Social Media Addiction (measured using BSMAS)
- Sleep Quality (measured using PSQI)

Dependent variable (DV).

- Academic Performance (measured through self-reported academic scores/scale)

3.5 Operational Definitions

Sleep Quality. Refers to an individual's overall sleep experience, including duration, efficiency, and disturbances, operationalized

through total scores on the Pittsburgh Sleep Quality Index (PSQI), where higher scores indicate poorer sleep quality.

Academic Performance. Refers to the level of academic achievement of students, measured through self-reported academic scores or performance indicators. **Emerging Adults.** Individuals aged approximately 18–25 years, typically undergraduate students undergoing a transition phase between adolescence and adulthood (Arnett, 2000).

Social media addiction. Refers to excessive and compulsive use of social media platforms characterized by loss of control, preoccupation, and behavioural dependence, operationalized through total scores on the Bergen Social Media Addiction Scale (BSMAS).

3.6 Sample and Sampling Technique

3.6.1 Sample Characteristics. The sample consisted of 122 emerging adults, aged between 18 and 25 years. Participants were undergraduate students from various educational institutions.

3.6.2 Sampling Technique. A purposive sampling technique was used to select participants based on specific inclusion criteria relevant to the study. This method

was appropriate as the study focused on a defined population of students.

3.7 Inclusion and Exclusion Criteria

Inclusion criteria.

- Students aged between 18–25 years
- Undergraduate students
- Active users of social media
- Willing to provide informed consent

Exclusion criteria.

- Participants outside the specified age range
- Individuals with incomplete responses
- Non-students

3.8 Tools Used for Data Collection

3.8.1 Bergen Social Media Addiction Scale (BSMAS). The BSMAS developed by Andreassen et al. (2016) is a standardized self-report instrument used to assess social media addiction. The scale consists of items measuring core addiction components such as salience, mood modification, tolerance, withdrawal, conflict, and relapse. Responses are recorded on a Likert scale, with higher scores indicating greater levels of social

media addiction. The scale has demonstrated good reliability and validity.

3.8.2 Pittsburgh Sleep Quality Index (PSQI)

The PSQI developed by Buysse et al. (1989) is widely used to assess sleep quality over a one-month period. It includes components such as sleep duration, latency, disturbances, and daytime dysfunction. Higher scores indicate poorer sleep quality. The PSQI has strong psychometric properties and is widely used in sleep research.

3.8.3 Academic Performance Measure

Academic performance was assessed using self-reported academic scores/scale. Participants provided information regarding their academic achievement, which was used as an indicator of performance.

3.9 Procedure

Data was collected using an online survey method. Participants were informed about the purpose of the study and assured of confidentiality and anonymity. After obtaining informed consent, participants completed a demographic form followed by the BSMAS, PSQI, and academic performance measure.

Participants were instructed to respond honestly, and sufficient time was provided to complete the questionnaire. The data collected were then coded and analysed using appropriate statistical methods.

3.10 Ethical Considerations

The present study adhered to standard ethical guidelines in conducting research involving human participants. Prior to data collection, participants were clearly informed about the purpose and nature of the study. Informed consent was obtained from all participants, ensuring that their participation was entirely voluntary.

Confidentiality and anonymity were strictly maintained throughout the research process. Participants were not required to disclose personally identifiable information, and all responses were used solely for academic purposes. Data was securely stored and accessed only by the researcher.

Participants were also informed of their right to withdraw from the study at any stage without any penalty. Care was taken to ensure that the study did not cause any psychological discomfort or harm. Since the study involved self-report measures related to social media use, sleep patterns, and

academic performance, the risk involved was minimal.

Overall, the research was conducted with respect for participants' dignity, privacy, and well-being, in accordance with ethical standards for psychological research.

3.11 Statistical Analysis

Data were analyzed using the **Statistical Package for the Social Sciences (SPSS)**.

The following analyses were conducted:

Descriptive statistics (mean and standard deviation) were computed to summarize the characteristics of the sample and the study variables, namely social media addiction, sleep quality, and academic performance.

Pearson's product-moment correlation was used to examine the relationships between social media addiction, sleep quality, and academic performance.

Multiple linear regression analysis was conducted to determine whether social media addiction and sleep quality significantly predicted academic performance.

Assumption checks for regression analysis were performed, including tests of normality (Kolmogorov–Smirnov and Shapiro–Wilk tests), analysis of residuals, independence of

errors (Durbin–Watson statistic), and absence of multicollinearity.

Statistical significance was evaluated at the 0.05 level ($p < .05$).

CHAPTER 4 RESULTS

4.1 Introduction to Data Analysis

This chapter presents the analysis and interpretation of data collected to examine the relationship between social media use, sleep quality, and academic performance among emerging adults. The analysis was carried out using appropriate statistical techniques to understand patterns, relationships, and predictive effects among the study variables.

Descriptive statistics were used to summarize the characteristics of the data, followed by tests of normality to assess distribution assumptions. Further, correlation and regression analyses were conducted to explore the relationships between variables and determine their predictive influence on academic performance. The findings are presented systematically in the following sections.

4.2 Descriptive Statistics

Descriptive statistics were computed to summarize the central tendency and variability of academic performance. The mean score was 27.87 (SD = 5.869), indicating a moderate level of academic achievement among participants. The 95% confidence interval (26.82–28.92) shows that the mean is stable and reliable. The median (28.00) and trimmed mean (28.03) are very close to the mean, suggesting consistency in the distribution of scores.

The variability in scores was relatively high, with a range of 32 (minimum = 8, maximum = 40) and an interquartile range of 7. The data showed a slight negative skew (–0.412), indicating that more participants scored above the average, while the kurtosis value (1.212) suggests a moderately peaked distribution. Overall, these findings indicate noticeable variation in academic performance, which may be influenced by factors such as sleep quality and social media use.

Table 4.2

Descriptive Statistics for Academic Performance (N = 122)

Variable	M	SD	Min	Max	Range	IQR	Skewness	Kurtosis
Academic Performance	27.87	5.87	8	40	32	7	-0.41	1.21

Note. M = Mean; SD = Standard Deviation; Min = Minimum; Max = Maximum; IQR = Interquartile Range.

95% CI for mean = [26.82, 28.92].

4.3 Tests of Normality

Normality of the academic performance scores was assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests. The results indicated that academic performance significantly deviated from a normal distribution, as both the Kolmogorov–Smirnov test, $D(122) = .091$, $p = .015$, and the Shapiro–Wilk test, $W(122) =$

$.969$, $p = .006$, were statistically significant ($p < .05$). This suggests that the assumption of normality was violated for this variable.

However, considering the relatively large sample size ($N = 122$), the violation of normality is not considered severe, as parametric tests are generally robust to such deviations. Therefore, further analyses such as correlation and regression were conducted.

Table 4.3

Tests of Normality for Academic Performance (N = 122)

Variable	Kolmogorov-Smirnov D	df	p	Shapiro-Wilk W	df	p
Academic Performance	.091	12	.01	.969	12	.00

4.5 Regression Analysis

Descriptive statistics were computed prior to conducting regression analysis to understand the central tendency and variability of the study variables. The mean score for academic performance was 27.87 (SD = 5.869), indicating a moderate level of academic achievement among participants. Sleep quality had a mean of 5.59 (SD = 3.267), suggesting variability in participants' sleep patterns, with some experiencing poorer sleep quality. Social media usage showed a mean of 15.34 (SD = 5.854), reflecting moderate engagement among the sample.

These descriptive findings indicate that all variables exhibit sufficient variability, which supports their inclusion in regression analysis. The differences in standard deviations suggest that participants vary

notably in their sleep quality and social media use, which may contribute to differences in academic performance.

Table 4.4

Descriptive Statistics for Regression Variables (N = 122)

Variable	M	SD	N
Academic Performance	27.87	5.87	122
Sleep Quality	5.59	3.27	122
Social Media Use	15.34	5.85	122

Note. M = Mean; SD = Standard Deviation.

4.4 Correlation Analysis

Pearson correlation analysis was conducted to examine the relationships between academic performance, sleep quality, and social media use. The results indicated a weak negative correlation between academic performance and sleep quality ($r = -.150$, $p = .050$), suggesting that poorer sleep quality is slightly associated with lower academic performance. Similarly, academic performance showed a weak negative correlation with social media use ($r = -.093$, $p = .155$); however, this relationship was not statistically significant.

In contrast, a moderate positive correlation was found between sleep quality and social media use ($r = .375, p < .001$), indicating that higher social media usage is associated with poorer sleep quality. Overall, these findings suggest that while sleep quality and social media use are related to each other, their direct relationship with academic performance is weak, highlighting the possibility that other factors may play a more significant role in influencing academic outcomes.

Table 4.5

Pearson Correlations Among Study Variables (N = 122)

Variable	1	2	3
1. Academic Performance	—	-.150	-.093
2. Sleep Quality	-.150	—	.375
3. Social Media Use	-.093	.375	—

4.6 Residual Analysis

Residual analysis was conducted to assess the assumptions of the regression model and to examine the distribution of errors. The predicted values ranged from 24.71 to 29.61, with a mean of 27.87, indicating that the model predictions were centered around the

observed mean of academic performance. The residuals had a mean of 0.000 and a standard deviation of 5.798, suggesting that the errors were evenly distributed around zero. The standardized residuals ranged from -3.484 to 2.094 , which are generally within the acceptable limits (± 3), indicating no extreme outliers or influential cases that could significantly distort the regression results. Additionally, the standardized predicted values ranged from -3.471 to 1.917 , showing no major deviation from normality.

Overall, the residual statistics suggest that the assumptions of linearity, independence, and homoscedasticity are reasonably met. Although minor deviations from normality were observed earlier, the residual distribution does not indicate serious violations. Therefore, the regression model can be considered appropriate for interpreting the relationship between sleep quality, social media use, and academic performance.

4.7 Summary of Findings

- The mean academic performance score ($M = 27.87$) indicates a moderate level of achievement among participants.

- Descriptive statistics showed considerable variability in academic performance ($SD = 5.869$; $Range = 32$).
- Normality tests (Kolmogorov–Smirnov and Shapiro–Wilk) indicated that data deviated from normal distribution, though acceptable due to large sample size.
- Correlation analysis revealed a weak negative relationship between academic performance and sleep quality ($r = -.150$, $p = .050$).
- A non-significant weak negative relationship was found between academic performance and social media use ($r = -.093$, $p = .155$).
- A moderate positive correlation was observed between social media use and poor sleep quality ($r = .375$, $p < .001$).
- Regression analysis showed that sleep quality and social media use did not significantly predict academic performance.
- Collinearity statistics confirmed no multicollinearity issues between predictors ($VIF \approx 1.16$).
- Residual analysis indicated no major violations of regression assumptions, supporting the validity of the model.

- Overall, findings suggest that sleep quality and social media use are interrelated, but their direct impact on academic performance is limited, implying the role of other influencing factors.

CHAPTER 5

DISCUSSION AND ANALYSIS

5.1 Introduction

The purpose of this chapter is to interpret and critically discuss the findings presented in Chapter 4. The present study examined the behavioural correlates of sleep quality and social media addiction and their implications for academic performance among emerging adults. Using correlation and multiple regression analyses, the findings indicated weak negative relationships between academic performance and both sleep quality and social media use, while a significant association was observed between social media use and poor sleep quality. This chapter situates these findings within established theoretical frameworks and existing empirical literature, while also considering the behavioural patterns of emerging adults in a digitally driven context.

5.2 Interpretation of Descriptive Findings

The descriptive findings revealed that participants demonstrated a moderate level of academic performance, with noticeable variability across the sample. Similarly, sleep quality and social media usage also showed considerable variation, suggesting differences in lifestyle patterns among emerging adults. These findings indicate that students are not a homogeneous group, but rather differ in their behavioural habits, particularly in relation to digital engagement and sleep routines.

The moderate levels of social media usage observed in the study reflect the increasing integration of digital platforms into daily life. Previous research suggests that emerging adulthood is a developmental stage characterized by identity exploration and increased reliance on online interaction (Arnett, 2000). At the same time, variability in sleep quality indicates that many students experience irregular or insufficient sleep, which may be influenced by academic demands, lifestyle choices, and digital media exposure (Walker, 2017).

5.3 Relationship Between Sleep Quality, Social Media Addiction, and Academic Performance

The correlation analysis revealed a weak negative relationship between academic performance and sleep quality, suggesting that poorer sleep is associated with slightly lower academic outcomes. This finding aligns with prior research indicating that inadequate sleep negatively affects attention, memory consolidation, and learning efficiency (Walker, 2017). However, the relationship was relatively weak, indicating that sleep quality alone may not strongly determine academic success.

Similarly, social media use showed a weak and non-significant negative relationship with academic performance. This suggests that although excessive social media use may contribute to distraction, its direct impact on academic outcomes is limited. However, a significant positive relationship was found between social media use and poor sleep quality, indicating that increased digital engagement is associated with disrupted sleep patterns. This supports previous studies which highlight that late-night screen exposure and compulsive checking behaviours interfere with sleep hygiene (Twenge et al., 2018).

5.4 Predictive Role of Sleep Quality and Social Media Use

The regression analysis indicated that neither sleep quality nor social media use significantly predicted academic performance. This suggests that these variables, although behaviourally relevant, do not independently account for variations in academic outcomes. The findings imply that academic performance is influenced by multiple factors such as motivation, study habits, emotional well-being, and environmental support.

This result contrasts with some earlier studies that reported significant predictive effects but is consistent with research emphasizing the multifactorial nature of academic performance (Richardson et al., 2012). The weak predictive power observed in the present study suggests that sleep and social media may act as indirect or interacting factors rather than primary determinants.

5.5 Integration with Social Comparison Theory

The findings can be partially interpreted through Social Comparison Theory (Festinger, 1954). Social media platforms encourage individuals to engage in continuous comparison with peers, which can lead to increased cognitive engagement and

emotional arousal. This may indirectly affect sleep quality, as individuals remain mentally stimulated even after disengaging from digital platforms.

However, the absence of a strong relationship between social media use and academic performance suggests that not all forms of social media engagement are detrimental. It is possible that some students use these platforms for academic collaboration or stress relief, which may buffer negative outcomes.

5.6 Cognitive-Behavioural Interpretation

From a cognitive-behavioural perspective, excessive social media use can be viewed as a maladaptive coping strategy. Students experiencing stress or academic pressure may engage in social media use as a form of avoidance or emotional regulation. This behaviour can disrupt sleep patterns, leading to fatigue and reduced cognitive efficiency.

Poor sleep quality, in turn, affects executive functioning, including attention, decision-making, and self-regulation. However, since the direct impact on academic performance was weak, it suggests that students may

compensate for sleep deficits through adaptive strategies such as time management or increased effort.

5.7 Behavioural Cycle Explanation

The findings support a cyclical behavioural pattern between social media use and sleep quality. Increased social media engagement, particularly during nighttime, leads to delayed sleep and reduced sleep quality. Poor sleep results in fatigue and decreased concentration, which may affect academic engagement. In response to stress or reduced performance, students may further engage in social media as a coping mechanism, thereby reinforcing the cycle.

This behavioural loop highlights the interconnected nature of digital habits and health behaviours among emerging adults, emphasizing the need to address both simultaneously.

5.8 Cultural Context and Implications

In the Indian context, rapid digitalization and widespread smartphone use have significantly influenced student lifestyles. Emerging adults often balance academic expectations with social connectivity, leading to increased screen time and irregular sleep schedules. Cultural emphasis on academic

success may also lead students to sacrifice sleep in favour of study or digital engagement.

These findings reflect the reality of modern student life, where technology plays a central role, but its effects are complex and not entirely detrimental.

5.9 Implications of the Study

Psychological Implications: The findings of this study emphasize the critical role of healthy sleep habits and mindful social media use in promoting psychological well-being among emerging adults. Poor sleep quality and excessive social media engagement were found to be interrelated, and addressing these factors can help reduce fatigue, improve emotional regulation, and enhance overall cognitive functioning. Interventions aimed at improving sleep hygiene and moderating digital use may support students' mental health and resilience in academic and personal settings.

Educational Implications: From an educational perspective, the study underscores the importance of fostering digital literacy and time management skills among students. Educational institutions can play a proactive role by implementing

programs that raise awareness about the negative effects of excessive social media use and sleep deprivation on learning outcomes. Encouraging structured study routines, digital discipline, and informed engagement with online platforms may enhance students' academic efficiency and overall performance.

Practical Implications: Practically, students can adopt behavioural strategies to improve their daily functioning and academic outcomes. Simple interventions such as reducing screen exposure before bedtime, maintaining consistent sleep schedules, and scheduling breaks from social media can contribute to better sleep quality and cognitive alertness. By integrating these practices into their daily routines, students can optimize both their physical and mental energy, supporting sustained academic engagement and personal well-being.

5.10 Limitations of the Study

The study has several limitations that should be acknowledged. The cross-sectional design restricts the ability to draw causal inferences between social media use, sleep quality, and academic performance. Additionally, the reliance on self-report measures may

introduce response biases, such as social desirability or inaccurate recall. The sample size, though adequate for preliminary analysis, was limited to a specific population of undergraduate students, which may affect the generalizability of the findings to other age groups, regions, or cultural contexts.

5.11 Suggestions for Future Research

Future research could address these limitations by employing longitudinal or experimental designs to better establish causal relationships between social media use, sleep patterns, and academic outcomes. Including additional variables such as stress, motivation, mental health, and personality traits could provide a more comprehensive understanding of factors influencing academic performance. Moreover, intervention-based studies focusing on digital well-being and sleep hygiene strategies would be valuable in assessing practical approaches to mitigate the negative impacts of excessive social media use among emerging adults.

5.12 Conclusion

The present study highlights that while sleep quality and social media use are behaviourally interconnected, their direct

impact on academic performance is limited. The findings emphasize the complexity of student behaviour in the digital age and suggest that academic success is influenced by multiple interacting factors. Understanding these relationships in a real-life context can help students develop healthier habits and achieve better overall well-being.

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☐ Author 2: Data Curation, Formal Analysis, Writing – Review Editing

☐ Author 2: Guidance in all stages

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Article

An Assessment of Digital Literacy and Digital Wellness among Elderly People in Bangalore City

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Abstract

Digital technology has transformed communication, healthcare, banking, education and social interaction. For older adults, however, digital participation may be affected by limited exposure, low confidence, physical difficulties, technological anxiety, privacy concerns and fear of online fraud. This study assessed digital literacy and digital wellness among elderly people in Bangalore City and examined their patterns of digital use, barriers and awareness of safe and healthy digital practices. A descriptive research design was used with 70 elderly respondents selected through purposive sampling. Primary data were collected using a researcher-developed structured questionnaire containing 31 closed-ended questions covering demographic profile, digital knowledge, usage, barriers, benefits and digital wellness. Data were analysed using frequency and percentage. The findings show a mixed but promising pattern: 79%

knew how to use a smartphone, 70% knew how to make video calls and 74% knew how to use the internet. However, only 49% could find information through search engines, 39% knew how to send an email or online message, and 46% were familiar with digital payments. Digital wellness practices were also uneven: 60% took breaks during prolonged use, 53% attempted to limit daily device use and 54% reported knowing basic online safety, while 50% checked website or app safety before use. The findings indicate that basic familiarity does not necessarily translate into independent, safe and confident digital participation. Targeted, practical and age-sensitive training, peer support, repeated practice, online-safety education and culturally appropriate digital wellness programmes are recommended to strengthen digital inclusion and quality of life among older adults.

Keywords: *Digital literacy; digital wellness; elderly people; digital inclusion; technology adoption; online safety; older adults.*

Introduction

Digital technology has become part of everyday life, changing how people communicate, obtain information, access

healthcare, manage money and interact with public services. Older adults are an important population within this transition because many did not grow up with smartphones, social media or internet-based services. Their experiences therefore vary according to previous exposure, education, income, physical ability, motivation and access to support. Digital literacy is more than the ability to operate a device. It includes the ability to access, understand, evaluate, communicate and use digital information safely.

For older adults, relevant skills include smartphone operation, internet use, communication, searching for information, digital payments, privacy management, recognition of scams and adaptation to new applications. Digital wellness refers to maintaining a healthy and purposeful relationship with technology through balanced use, protection of privacy, critical evaluation of online information, safe behaviour, appropriate breaks and maintenance of real-world social connections. Digital literacy can promote independence by supporting communication with family, access to healthcare, online services, learning and financial activities. It

may also reduce isolation and improve self-efficacy. At the same time, poor digital literacy may increase dependence on family members and vulnerability to misinformation, fraud and frustration.

Digital wellness is therefore essential alongside technical skill. Previous literature in the study highlights fear of failure, low confidence, limited access, age-related limitations, unfriendly design and complex training materials as common barriers. Research also indicates that community-based, peer-supported, practical and blended learning approaches can improve older adults' digital participation. Indian studies particularly point to the influence of education, socioeconomic conditions, language, physical limitations, privacy concerns and access to appropriate support. The present study was undertaken to assess digital literacy and digital wellness among elderly people in Bangalore City, identify their patterns of digital engagement and barriers, and suggest social-work-oriented interventions.

Review of Literature

The literature reviewed in the source consistently shows that older adults can learn

and benefit from digital technology when training is supportive, practical and relevant to daily life. McKee and Blair (2007) identified fear of failure, low confidence and limited access as barriers, while community-based learning promoted connection and empowerment. Kamal and Patil (2011) reported that internet use could add social value and improve quality of life. Kumar et al. (2013) emphasized anxiety, overwhelming information and technological change as barriers and recommended empathetic, user-centred training. Blake and Ray (2016) highlighted the value of peer support.

Chiu and Liu (2017) found education to be an important predictor of technology adoption and reported psychological and health barriers to continued use. Martinez-Alcala et al. (2018) found improvement in digital literacy through both face-to-face and blended workshops, with greater improvement in the blended group. Datta et al. (2019) stressed affordable access, intuitive interfaces and secure authentication, while Bhattacharjee et al. (2020) identified age related limitations, poor design, low self-efficacy, societal attitudes and complex materials as major barriers. Indian evidence

in the reviewed literature is particularly relevant. Mitra et al. (2022) identified usability, anxiety, privacy concerns, self-perception and the need for technology literacy as important themes.

Rasekaba et al. (2022) reported very low digital and health literacy in a rural Indian sample and recommended family and community support. Bansal and Choudhary (2023) showed that educational and socioeconomic factors shape internet outcomes among urban Indian older adults. Patel et al. (2023) reported rural–urban differences in digital health literacy. Lee and Kim (2023) found that digital literacy was associated with social capital and self-efficacy. More recent studies reviewed in the source recommend senior-friendly interfaces, personalised support, peer education, culturally and linguistically appropriate programmes and practical learning.

A clear research gap remains: there is limited long-term evidence on culturally tailored interventions, especially in Indian and low-resource contexts, and insufficient co-design of digital tools with older adults. The present assessment contributes local descriptive evidence on both digital literacy and digital wellness.

Methodology

Problem Statement

To what extent are elderly people digitally literate, and how does their level of digital engagement affect their digital wellness?

Aim

To assess the level of digital literacy and the state of digital wellness among elderly people and to explore the relationship between the two.

Objectives

- To understand the demographic profile of respondents.
- To assess knowledge of digital devices and the internet.
- To examine the frequency and purposes of digital use.
- To identify facilitators and barriers affecting digital engagement.
- To assess awareness of the benefits of digital literacy and its impact on well-being.
- To explore digital wellness, including healthy digital habits, screen-time management and online safety.
- To suggest social work interventions.

Research Design and Participants

A descriptive research design was adopted. The study focused on elderly people aged 60 years and above who had access to a mobile phone or digital device, were physically and mentally able to respond and were living with family members. Individuals with severe cognitive impairment or communication difficulties and those without access to digital devices were excluded. Seventy respondents were selected using purposive sampling.

Data Collection and Tool

Primary data were collected using a structured Google Form questionnaire developed by the researchers. The questionnaire consisted of 31 closed-ended questions covering demographic profile, knowledge of digital devices and internet use, frequency and purpose of use, facilitators and barriers, awareness of benefits and well-being, and digital wellness practices. Secondary information was obtained from government reports, research papers and online sources.

Data Analysis and Ethics

Data were analysed using descriptive statistics, mainly frequency and percentage.

Participants were assured of voluntary participation and confidentiality, and no personal identifiers were used in reporting.

Analysis & Findings

The study consisted of 70 elderly respondents. Sixty percent were aged 60–70 years, 37% were aged 70–80 years and 3% were aged 80–90 years. The gender distribution was relatively balanced, with 53% male and 47% female respondents. Educational levels varied, with 30% having completed 10th standard, 26% being illiterate, 16% being graduates and 14% each having diploma or professional qualifications. Regarding occupation, 37% reported other professions, 24% were housewives, 22% were in business, 10% were farmers and 7% were labourers. Forty-seven percent reported a monthly income above ₹30,000, while 30% reported

₹10,000–₹20,000 and 23% reported ₹20,000–₹30,000.

Basic digital literacy was comparatively stronger. Seventy-nine percent knew how to use a smartphone, 70% knew how to make a video call and 74% knew how to use the internet. However, more complex or independent skills were weaker. Only 49%

could find information using Google or another search engine, 39% knew how to send an email or online message and 46% were familiar with digital payments. Fifty-nine percent used a digital device every day. Internet use varied from everyday use among 36% to rare use among 30%. Digital engagement was primarily social or recreational, with 63% using the internet to communicate with family or friends and 71% using it to watch videos or listen to music. Use for purchasing or paying bills was lower at 33%.

Social support was an important facilitator. Fifty-nine percent reported that someone had taught them to use digital services. At the same time, several barriers were identified. Fifty-one percent experienced difficulties such as poor eyesight or shaking hands, 56% were afraid to use new applications or websites and 50% found application or website instructions difficult to understand. Although 57% felt that internet use helped them stay connected with others, only 41% had used the internet to find health tips or advice.

Digital wellness practices showed a mixed pattern. Seventy-three percent did not feel more relaxed or mentally active after using

digital tools, although 60% took breaks during prolonged use. Fifty-three percent tried to limit daily device use and 60% kept their phone away during sleep or meals. Fifty-four percent knew basic online safety practices, while checking website or application safety was evenly divided at 50%. When unsure about online activities, 64% asked someone for help.

Table 1: Key digital literacy and digital wellness indicators

Indicator	Yes / Positive	No / Other
Smartphone use	79%	21%
Video calls	70%	30%
Internet use	74%	26%
Search-engine use	49%	51%
Email / online messaging	39%	61%
Digital-payment familiarity	46%	54%
Daily digital-device use	59%	41%
Internet for family/friends	63%	37%
Internet for purchases/bills	33%	67%
Difficulty from eyesight/hand movement	51%	49%
Fear of new apps/websites	56%	44%
Takes breaks during prolonged use	60%	40%
Limits daily device use	53%	47%
Knows basic online safety	54%	46%
Checks website/app safety	50%	50%
Seeks help when unsure online	64%	36%

The findings indicate that elderly respondents possess a reasonable foundation of basic digital familiarity but demonstrate clear gaps in independent and advanced digital skills. High levels of smartphone, video-call and internet use suggest that digital technology is no longer completely unfamiliar to many older adults. However, lower levels of information searching, email or messaging, digital payment familiarity and health-related internet use indicate that basic familiarity does not automatically translate into functional digital literacy.

The findings also demonstrate the importance of social support. Many respondents learned digital services from another person and sought help when uncertain online. This corresponds with the literature highlighting family, peer and community support as facilitators of digital adoption. However, dependence on others may limit autonomy if older adults do not receive opportunities for repeated hands-on practice.

Physical and psychological barriers also require attention. Difficulties related to eyesight or hand movement, fear of unfamiliar applications and difficulty understanding instructions may reduce confident digital participation. These

findings are consistent with literature identifying physical limitations, anxiety, low self-efficacy and complex interfaces as barriers.

Digital wellness requires similar attention. Although many respondents reported taking breaks and limiting device use, online safety practices remained inconsistent. The equal division in checking whether websites or applications were safe indicates an important safety gap. The findings therefore suggest that digital inclusion should encompass not only access and frequency of use but also confidence, critical evaluation, privacy, safety and healthy digital habits.

Conclusion

The study shows that elderly people are increasingly engaging with digital technology, but digital inclusion remains uneven. Among the 70 respondents, basic skills such as smartphone, video-call and internet use were relatively common, whereas information searching, email or online messaging, digital payments and health-related internet use were less developed. Physical difficulties, fear of unfamiliar applications and difficulty understanding instructions further limited

confident participation. Digital wellness practices were also inconsistent, particularly in relation to online safety.

The findings highlight the need for practical and age-sensitive approaches to digital inclusion. Community-based digital literacy programmes can be conducted in senior citizen centres and familiar community settings, with training divided according to existing skill levels. Practical activities such as making video calls, searching for reliable information, sending messages, using digital payments safely and accessing health services should be emphasised. Repeated practice, refresher sessions and individual guidance may be more effective than one-time workshops. Learning materials should use large print, visual and audio-visual resources and familiar or local languages.

Online-safety education should address scams, phishing, privacy, passwords, safe payments, misinformation and checking the authenticity of websites and applications. Peer learning and appropriate family involvement can provide support while maintaining the goal of independence rather than complete dependence. Digital wellness education should also promote screen-time awareness, regular breaks, healthy posture,

appropriate notification management, sleep-related boundaries and balance between online and offline relationships.

Social workers, community organisations, healthcare professionals and technology educators can collaborate to provide sustained support for older adults. Technology developers can further contribute by creating senior-friendly interfaces, accessible fonts, simple navigation and opportunities for older adults to participate in co-design. Future research should include larger and more diverse samples, comparisons between urban and rural populations and evaluation of the long-term effectiveness of culturally tailored interventions. Overall, digital empowerment can help older adults remain connected, informed, safe and independent.

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4. Informed Consent:

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5. Data Availability Statement:

The data that support the findings of this study are available upon reasonable request from the corresponding author.

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Article

TALKING TO MACHINES: A CORRELATIONAL STUDY OF EXTRAVERSION AND EMOTIONAL ATTACHMENT TO AI CHATBOTS

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Abstract:

The increasing use of AI chatbots has changed the way people seek information and support. Users start to develop emotional bonds with these chatbots as they become more conversational. However, it is unclear whether certain aspects of personality influence the strength of these connections. This study aims to understand if there exists a correlation between extraversion and level of emotional attachment to AI chatbots. Data were collected from undergraduate students aged 18-25 who have interacted with AI. Participants completed a self-report questionnaire consisting of two sections: one assessing their extraversion and another measuring their emotional attachment to AI, both using a Likert-type scale. It was hypothesized that a relationship between extraversion and level of attachment to AI chatbots does exist, with individuals lower in extraversion expected to report stronger attachment. The collected data will be analyzed using correlational statistical methods to determine whether the hypothesis is supported. AI chatbots are increasingly

used for assistance and everyday problem-solving, which may affect the ways individuals emotionally respond to these systems. Understanding the psychological aspects that affect user engagement becomes even more important as interactions with AI increase. Examining the relationship between personality traits and emotional attachment to AI may contribute to the growing field of human–AI interaction research. The results of this study may shed light on how various personality traits affect how people relate to and engage with AI-based communication tools.

Keywords: *Generative Artificial Intelligence, AI Dependency, Academic Performance, Technostress, Cognitive Engagement, Higher Education.*

Introduction

Extraversion and Personality

Extraversion is one of the Big Five personality traits, describing how outgoing and sociable a person is. It is typically characterised by high energy, talkativeness, assertiveness, and enthusiasm. For instance, one personality inventory measures extraversion with items like “I see myself as someone who is talkative,” “energetic,” and

“assertive.”. These are precisely the kinds of attributes we target in Part A of our questionnaire (e.g. “talkative,” “outgoing, sociable,” “full of energy” vs. reverse-keyed items “quiet,” “shy”). Thus, the survey reliably assesses where individuals fall on the extraversion spectrum.

In human–computer interaction research, extraversion often predicts how people use social technology. Extroverted individuals typically engage more with interactive and social tools. For example, Korakakis et al. (2025) found that students higher in extraversion (as well as openness and conscientiousness) were more likely to use generative AI tools for learning. Deng et al. (2025) also hypothesised that extraverts would frequently use chatbots such as ChatGPT for conversation and social image enhancement. These users may use AI to impress peers or satisfy their social appetite, with extroversion positively related to perceived computer self-efficacy and usage. In short, highly extraverted people often use technology actively, especially features that allow communication.

However, studies specifically about AI companionship show mixed effects of extraversion. Some research suggests that

while extraverts use technology more, they might be less satisfied with AI as a social partner. Park & Woo (2022) reported that extroverts had more negative attitudes toward AI chatbots, possibly because they prefer real human interaction. In contrast, introverts or anxious individuals (characterized by low extraversion) may appreciate chatbots' lack of judgment. This contrast is important: do outgoing people bond more with AI because they interact more, or do quieter individuals bond more because they need support? Our hypothesis assumes the latter: that introverted individuals may form stronger emotional ties with AI.

Parasocial Interaction and Attachment to AI

To understand AI attachment, we turn to attachment theory and parasocial interaction. Attachment theory (originally developed for human relationships) has been extended to technology. Recent work shows that people can develop "attachment-like bonds" with chatbots. Yang et al. (2025) adapted attachment theory to AI: they found that many users treat chatbots as sources of comfort and advice. In their survey, about 75% of users had sought advice from an AI, and 39% described the AI as a reliable

presence. They conceptualized human–AI attachment in terms of anxiety (needing reassurance) and avoidance (needing distance), analogous to interpersonal attachment styles. This suggests chatbots can meet attachment needs for some people.

Further research provides direct measures of AI attachment. Sandeeshwara & Hartanto (2025) developed an AI Attachment Scale with three subscales: emotional closeness (feeling warmth or comfort with the AI), social substitution (using AI when human connection is lacking), and normative regard (treating the AI with respect and care). They found that people who spend time on chatbots for social/emotional reasons score higher on attachment. Moreover, those with stronger AI attachment tended to report greater well-being (positive affect, life satisfaction). In essence, chatbots can fulfil real psychological needs.

Our Part B items reflect these dimensions. For example, "I feel a sense of closeness and comfort in my interactions with AI" and "My exchanges with AI feel personally meaningful" capture emotional closeness. Items like "When there's no one to talk to, I sometimes end up interacting with AI" and "I often talk to AI when I face problems" reflect

social substitution (using AI instead of people). Questions such as “I try to treat AI respectfully” and “It feels wrong to be dismissive when responding to AI” tap normative regard. Together, they measure whether a user perceives and behaves toward the AI as a social partner.

A related idea is parasocial interaction. This concept describes how people form one-sided relationships with media figures or agents. Applied to chatbots, parasociality means users treat the AI as if it were a friend. Research shows this happens often: chatbots that display empathy and personality can make users feel supported. For instance, Gao et al. (2024) found that users create parasocial bonds with friendly chatbots and derive emotional support from them. In practical terms, users report opening up to AI because “you don’t have to worry about being judged”, aligning with our item “I sometimes prefer talking to AI because I don’t have to worry about being judged.” These studies confirm that chatbots can fulfil social needs in ways similar to human companions.

Rationale and Hypothesis

The above literature suggests chatbots serve social as well as informational roles, and that individual differences influence attachment to them. Our research specifically examines extraversion as a predictor of AI attachment. We hypothesize a correlation between extraversion and attachment level: individuals lower in extraversion (more introverted) will report stronger attachment to AI chatbots. The reasoning is twofold. First, introverted or anxious people often seek nonjudgmental companions, which chatbots provide. Second, extroverts may have extensive real social networks, reducing their need to attach to an AI. Under this hypothesis, we expect to find a negative correlation between extraversion scores (Part A) and attachment scores (Part B).

To test this, we surveyed college-going students (18–25) who have used AI chatbots. Participants completed the questionnaire in two parts: Part A (extraversion) and Part B (attachment to AI). We will use correlational analysis to examine the relationship. If our hypothesis is supported, it would mean that a user’s sociability level predicts how emotionally bonded they become with AI. Understanding this link can contribute to human–AI interaction research by

highlighting how personality shapes user engagement.

In sum, this introduction and literature review establish that AI chatbots are used socially and emotionally, that extraversion influences social technology use, and that users do form attachment-like bonds to chatbots. Our study builds on these findings by examining the specific role of extraversion. Through thorough literature integration, we justify our focus on extraversion and our hypotheses, situating the research in the context of evolving human–AI relationships.

Review of Literature

The rapid integration of Generative Artificial Intelligence (GenAI) into academic environments has stimulated an emerging body of research examining its implications for learning processes, cognitive engagement, and academic outcomes. Scholars from the fields of educational psychology, technology studies, and higher education research have begun to investigate the ways in which AI tools influence students' study behaviors, decision-making patterns, and intellectual development. The following review synthesizes key literature related to AI reliance, cognitive engagement,

psychological predictors, and academic performance among undergraduate students.

Cotton, Cotton, and Shipway (2023) examined how students across different academic disciplines perceive and use generative AI technologies. Their research revealed that students in STEM fields were more likely to adopt AI tools for coding, data analysis, and problem-solving tasks, whereas students in humanities disciplines primarily used AI for writing assistance and idea generation. The study also highlighted differences in attitudes toward AI reliability and ethical concerns, suggesting that disciplinary cultures influence how students engage with emerging technologies.

Dwivedi et al. (2023) conducted a comprehensive multidisciplinary review examining the adoption of generative artificial intelligence across educational and professional contexts. Their analysis highlighted that generative AI tools such as language models are increasingly used by students for drafting assignments, summarizing academic content, and solving complex problems. The researchers observed that while these tools significantly improve efficiency and accessibility to information, they also introduce the risk of overreliance,

particularly among students who lack advanced subject knowledge. Dwivedi and colleagues emphasized that excessive dependence on AI-generated outputs may discourage critical evaluation of information and potentially weaken analytical reasoning skills. Their findings underscore the growing need to examine patterns of AI reliance within higher education and evaluate how these patterns influence learning outcomes.

Kasneci et al. (2023) explored the educational potential and risks associated with generative AI systems in higher education environments. Through an interdisciplinary review of emerging research, the authors found that students often use AI tools as cognitive assistants for brainstorming ideas, drafting essays, and obtaining explanations of difficult concepts. While these practices may enhance productivity, the study also identified a tendency among students to accept AI-generated responses without rigorous verification. Kasneci et al. argued that such patterns represent an early form of algorithmic dependency, where learners gradually substitute their own reasoning processes with automated outputs. The authors concluded that although AI can

function as a powerful learning aid, uncontrolled reliance may hinder the development of independent academic competencies.

Baidoo-Anu and Ansah (2023) conducted an empirical study examining how university students utilize generative AI tools in academic settings. Their findings indicated that students frequently employ AI systems to assist with writing assignments, information retrieval, and concept clarification. While moderate use of AI tools was associated with improved productivity and time management, the researchers observed that heavy reliance often corresponded with reduced engagement in independent study practices. Students who relied extensively on AI-generated responses demonstrated lower levels of conceptual understanding and weaker retention of course material. The study therefore suggested that although AI can enhance efficiency, excessive dependence may undermine the depth of learning necessary for academic success.

Chan and Hu (2023) investigated the relationship between generative AI use and academic performance among university students in technology-driven learning

environments. Their study revealed that students who used AI tools as supplementary resources - rather than replacements for independent thinking-tended to achieve better academic outcomes. Conversely, students who depended heavily on AI-generated content were more likely to experience superficial learning, where assignments were completed successfully but conceptual mastery remained limited. The authors argued that the educational value of AI technologies depends largely on how they are integrated into the learning process.

Brand et al. (2019) proposed the Interaction of Person-Affect-Cognition-Execution (I-PACE) model to explain the development of technology-related behavioral dependencies. According to this framework, problematic patterns of technology use arise from interactions between individual predispositions, emotional responses, cognitive expectations, and behavioral reinforcement mechanisms. Although originally applied to internet-use disorders, the model has been increasingly used to examine emerging forms of digital dependency. When applied to AI technologies, the I-PACE model suggests that factors such as personality traits,

emotional satisfaction from AI assistance, and beliefs about AI reliability may collectively contribute to the development of AI reliance behaviors.

Sparrow, Liu, and Wegner (2011) conducted a series of experiments investigating how access to digital information systems affects human memory and learning processes. Their findings demonstrated that individuals who expect information to be readily available through technological sources tend to remember the location of information rather than the information itself. This phenomenon, sometimes referred to as the “Google effect,” illustrates how digital technologies reshape cognitive strategies for knowledge acquisition. In the context of generative AI, similar mechanisms may lead students to rely on AI-generated explanations instead of actively constructing knowledge through independent analysis.

Ayyagari, Grover, and Purvis (2011) further examined the relationship between technology use and workplace stress by analyzing how technological demands influence emotional well-being. Their findings revealed that excessive reliance on digital tools can produce feelings of dependency, frustration, and mental

exhaustion. Although the study focused on organizational settings, similar mechanisms may operate among students who rely heavily on AI systems to manage academic workloads. Such findings suggest that technological assistance can simultaneously provide convenience while also contributing to psychological strain.

Hancock, Billings, Schaefer, Chen, De Visser, and Parasuraman (2011) conducted a meta-analysis examining the factors influencing trust in human-machine interactions. Their findings indicated that perceived reliability, ease of use, and prior positive experiences significantly increase users' trust in automated technologies. The researchers concluded that high levels of trust often predict greater dependence on technological systems, particularly when users believe that the technology consistently produces accurate outcomes. Within the context of generative AI, such dynamics may reinforce continued reliance on AI-generated academic content.

Carr (2010) examined the broader cognitive consequences of heavy reliance on digital technologies in his influential analysis of internet usage and attention patterns. Carr argued that when individuals consistently

depend on external technological systems for information processing, they gradually engage less deeply with complex ideas. This process, often described as cognitive offloading, reduces the need for sustained concentration and critical reasoning. Although Carr's work predates generative AI technologies, his analysis provides an important conceptual foundation for understanding how excessive technological assistance may influence cognitive engagement in educational contexts.

Tarafdar, Tu, Ragu-Nathan, and Ragu-Nathan (2007) introduced the concept of technostress, describing the psychological strain individuals experience when interacting with complex digital systems. Their research identified several key dimensions of technostress, including information overload, technological complexity, and constant connectivity pressures. In educational contexts, students who frequently engage with advanced technological tools may experience cognitive fatigue and stress associated with continuous digital engagement. As AI technologies become more embedded in academic workflows, technostress may emerge as an

important psychological outcome of prolonged AI usage.

Lee and See (2004) conducted a foundational study on trust in automated systems, examining how individuals develop confidence in technological decision-making tools. Their research demonstrated that when users perceive automated systems as highly reliable, they are more likely to accept system outputs without critical verification. While such trust can enhance efficiency, excessive trust may lead to inappropriate reliance on automation. In educational settings, students who perceive AI-generated responses as accurate or authoritative may rely on them without thoroughly evaluating the information.

Bandura (1997) developed the concept of self-efficacy, referring to individuals' beliefs in their capacity to perform specific tasks successfully. Within educational contexts, students with high academic self-efficacy tend to demonstrate greater persistence, deeper learning strategies,

and stronger engagement with challenging material. Conversely, students with lower confidence in their abilities may be more inclined to rely on external support systems,

including technological tools. The self-efficacy framework therefore provides a useful lens for understanding why certain students may become more dependent on AI assistance during academic tasks.

3. METHODOLOGY

3.1 Participants

The study included young adults aged 18 to 25 years who had previous experience interacting with AI chatbots for different purposes. Participants were recruited from colleges, specifically undergraduate students. They were selected using convenience sampling through digital platforms like social media, such as Instagram and Discord, based on their familiarity with AI chatbots. A total of 63 participants participated in the study.

Inclusion criteria are:

1. Aged between 18 and 25 years
2. Willingness to participate voluntarily
3. Ability to understand and complete an English-language questionnaire
4. Must have prior experience using AI chatbots

Exclusion criteria:

1. Individuals who have no prior experience with AI chatbots

3.2 Research Design

This study uses a quantitative, cross-sectional research design to explore the relationship between extraversion and emotional attachment to AI chatbots. Extraversion was defined by scores from selected items in the Big Five Inventory (BFI), measured with a 5-point Likert scale. Emotional attachment to AI chatbots was defined by scores from a self-report questionnaire that included items measuring emotional reliance, comfort, and perceived connection, also rated on a 5-point Likert scale. This design allows for the collection of quantitative data from a large sample at one point in time, making it effective for identifying patterns and relationships. The study focused only on the link between extraversion and emotional attachment to AI chatbots, without including other controlling, mediating, or moderating variables. As the study is correlational in nature, no variables were manipulated.

3.3 Variables

Independent Variable (IV): Extraversion

Dependent Variable

(DV): Emotional attachment to AI chatbots

Extraversion was defined by scores from selected items in the Big Five Inventory (BFI), while emotional attachment was defined by scores from the emotional attachment scale.

Though the study is correlational, extraversion will be considered the predictor variable and emotional attachment the outcome variable for analysis.

3.4 Instrumentation

Data was collected using a self-report questionnaire. Participants read and answered questions presented online. The questionnaire had two sections: the first part assessed participants' levels of extraversion, while the second part analyzed their emotional attachment to AI chatbots. The items were presented in order within the questionnaire, and no strict time limit was set.

Items were rated on a 5-point Likert scale:

1 – Strongly Disagree

2 – Disagree

3 – Neutral

4 – Agree

5 – Strongly Agree

Responses were scored from 1 to 5, with higher scores reflecting higher levels of extraversion and emotional attachment.

An example item is: “I enjoy being around people.”

The questionnaire was distributed through Google Forms and included the following sections:

Extraversion (Big Five Inventory - BFI): This section measures the level of extraversion among participants using a Likert-type scale. Items assessing extraversion were taken from the Big Five Inventory, with only relevant items selected for this study. Therefore, the extraversion section included 8 items.

Emotional Attachment to AI Scale: This section evaluated the level of emotional attachment participants feel toward AI chatbots. It contained items related to emotional reliance, comfort, and perceived connection with AI systems, consisting of 15 items.

3.5 Procedure

The questionnaire was shared online through digital platforms like social media. Participants accessed the questionnaire via an online link and received a brief overview of

the study's purpose and their role before responding. They were instructed to answer honestly based on their experiences with AI chatbots.

Participation was voluntary, and respondents were assured that their answers would remain confidential and be used only for academic purposes. No personally identifiable information was collected. Participants completed the questionnaire individually. There were no specific time limits regarding when to complete the questionnaire. It took about 5 to 6 minutes to finish.

3.6 Ethical Considerations

The study followed basic ethical principles. The following ethical considerations were followed:

Voluntary Participation: Participation was completely voluntary. Individuals could decide whether or not to fill out the questionnaire.

Informed Awareness: Participants received a brief description of the study's purpose before responding, helping them make an informed choice about their involvement.

Confidentiality: All responses were kept anonymous, and no personally identifiable

information was collected. The data was used only for academic purposes.

RESULTS

The present study aimed to examine whether there is a relationship between extraversion and emotional attachment to AI chatbots.

Descriptive statistics were calculated for both variables. The mean extraversion score was $M = 25.32$, $SD = 5.66$, and the mean emotional attachment score was $M = 38.90$, $SD = 11.46$.

To examine the relationship between extraversion and emotional attachment to AI chatbots, a Pearson product-moment correlation was conducted. The analysis revealed a weak positive correlation between participants' extraversion scores and their emotional attachment scores toward AI chatbots, $r(61) = .22$, $p > .05$.

These results are shown in Table 1.

Discussion

The aim of this study was to examine whether there exists a relationship between extraversion and emotional attachment to AI chatbots. The results showed a weak positive relationship between the two variables, but this relationship was not statistically

significant. This means that participants who were more extraverted showed slightly higher attachment to AI chatbots, but the relationship was very small and not strong enough to be considered as reliable.

These findings do not support the original hypothesis, which assumed that a relationship between the two does exist and that individuals lower in extraversion would show higher emotional attachment. Instead, the results suggest that extraversion may not have a clear or strong influence on how emotionally attached people feel toward AI chatbots. This could mean that emotional attachment to AI is not limited to introverted individuals, and that people across different personality types may engage with AI in similar ways.

This study adds to the understanding of human–AI interaction by suggesting that basic personality traits like extraversion may not be the main factor influencing emotional attachment. It is possible that other factors, such as how often people use AI, what they use it for, or their personal emotional needs, play a bigger role.

There are a few limitations in this study. The study only included college undergraduates,

so the findings may not apply to other age groups. As both the questionnaires are self-reports, this means that responses may not be completely accurate, as participants might respond based on what they think or what they would feel idealistically. In addition, the sample size may not have been large enough to detect a meaningful relationship.

Future research could improve on this by including a larger and more diverse sample. It would also be useful to look at other factors, such as frequency of AI use or emotional reliance, to better understand what affects attachment. They could also explore other personality traits or use different research designs to see if similar results are found.

Conclusively,

this study suggests that emotional attachment to AI chatbots is not strongly linked to extraversion alone, and that the relationship between personality and AI interaction may be more complex than initially expected.

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The authors declare no conflict of interest with respect to the research, authorship, or publication of this article.

3. Ethics Approval:

Ethics approval was not required for this study as it did not involve human/animal subjects.

4. Informed Consent:

Yes, informed written consent was obtained from all participants.

5. Data Availability Statement:

The data that support the findings of this study are available upon reasonable request from the corresponding author.

6. Author Contributions (Credit Statement):

☐ Author 1: Conceptualisation, Methodology, Writing – Original Draft

☐ Author 2: Data Curation, Formal Analysis, Writing – Review Editing

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Article

Mindfulness, FoMO and Social Media Use Among Emerging Adulthood in India

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Abstract

Social media has become an integral part of modern life, particularly among young adults, influencing various psychological constructs including fear of missing out and mindfulness. Fear of Missing Out (FOMO) is a pervasive apprehension that others might be having rewarding experiences from which one is absent, and is closely associated with excessive social media engagement. Mindfulness refers to one's ability to maintain present-moment awareness and attention without judgment. Multiple factors contribute to FOMO and reduced mindfulness in individuals including frequency of social media use, passive scrolling behavior, and compulsive checking of social media platforms. This study aims to explore the relationship between social media use, fear of missing out (FOMO), and mindfulness among respondents. The study was conducted on 127 respondents. Data was collected using the Social Media Use Scale

(SMUS), the Fear of Missing Out Scale (FOMOs), and the Five Facet Mindfulness Questionnaire (FFMQ). Statistical analysis of the obtained data revealed a significant positive relationship between social media use and FOMO, and a significant negative relationship between social media use and mindfulness. No significant relationship was observed between FOMO and mindfulness among the emerging adulthood.

Keywords: *Mindfulness, Social Media Use, FoMO, Emerging Adulthood*

Introduction

Mindfulness is the practice of intentionally focusing on the present moment with openness and non-judgment. It involves observing thoughts, feelings, and sensations as they arise without getting swept away by them. Rooted in Buddhist traditions, particularly the Pali term sati (awareness), mindfulness has evolved into secular practices. Modern programs like Mindfulness-Based Stress Reduction (MBSR), developed by Kabat-Zinn in 1979, popularized it in Western health settings. Common exercises include seated meditation, body scans, mindful breathing, or walking meditation. Start by setting aside

time to observe the breath or sensations, gently redirecting attention when the mind wanders. Regular practice reduces stress, enhances focus, improves emotional regulation, and fosters compassion. Research shows it can remodel brain structures related to attention and self-awareness. Social media use refers to interactive online platforms where individuals create, share, and engage with content like text, images, videos, and ideas within virtual communities. It has transformed communication, enabling global connections beyond traditional boundaries. Users leverage social media for entertainment, staying connected with friends and family, news consumption, brand promotion, and professional networking. Globally, billions participate daily, with activities like posting updates, following trends via hashtags, and joining communities shaping modern communication. FOMO, or Fear of Missing Out, is a pervasive anxiety that others are having rewarding experiences from which one is absent. Common scenarios include scrolling feeds during events others attend, hearing about new trends, or fearing missed social interactions. It drives behaviors like frequent checking for updates, heightening stress and loneliness. FOMO

contributes to depressive symptoms, problematic media use, and distorted self-perception through validation-seeking cycles. Younger users and heavy social media engagers are particularly susceptible.

Purpose of the Study

The purpose of this study is to examine the relationship between Fear of Missing Out (FoMO) and social media usage, as well as the relationship between mindfulness and social media usage among emerging adults in India. The study aims to understand how patterns of social media engagement are associated with psychological factors such as FoMO and mindfulness. By exploring these relationships, the research seeks to contribute to a better understanding of the psychological impacts of social media use and to provide insights that may inform mental health awareness and interventions among emerging adults.

Review of Literature

Jeffrey M. Greeson (2008) aimed to review the effects of mindfulness on the mind, the brain, the body, and behavior. The results indicate that cultivating a more mindful way of being is associated with less emotional distress, more positive states of mind, and

better quality of life. Chloe Berryman, Christopher J. Ferguson, and Charles Negy, in the year 2018, found that social media use was not predictive of impaired mental health functioning. Anushree Tandon, Amandeep Dhir, Intesar Almgren, Ghada Naif AlNemer, Matti Mäntymäki (2021), “Fear of Missing Out (FoMO) Among Social Media Users: A Systematic Literature Review, Synthesis and Framework for Future Research” found that there are significant limitations in conceptualization of FoMO, along with narrow focus on geographic, methodological and contextual foci of prior studies.

“Positive affective states predispose users to mindful use of social media, which, in turn, may enhance subjective mental health and protect from dysfunctional social media consumption”, Reza Shabahang, Ágnes Zsila, Mara S. Aruguete, Ho Phi Huynh, Gábor Orosz (2024). In a study titled, “From Fear of Missing Out (FoMO) to Addictive Social Media Use: The Role of Social Media Flow and Mindfulness”, researchers Julia Brailovskaia and Jurgen Margraf, in the year 2024, found a positive relationship between FoMO and addictive social media use. Both

were positively linked to social media (SM) flow.

In a study titled, “Mindfulness in Social Media Exposure: The Pressure-Reducing Valve for Fear of Missing Out and Social Media Fatigue”, researcher Xiaoxiao Huang in 2025 found that perceived value functions as an important antecedent of FoMO. Moreover, FoMO is not merely a conspicuous negative effect of social media exposure; it is also a key contributor to social media fatigue. Additionally, the negative associations of mindfulness with FoMO and social media fatigue underscore its effectiveness in alleviating both conditions.

Methodology

Aim

To study Mindfulness, FoMO and Social Media Use.

Objectives

The following are the objectives of the present study:

- To study the relationship between Social Media Use and Fear of Missing Out among emerging adulthood.

- To study the relationship between Social Media Use and Mindfulness among the emerging adulthood.
- To study the relationship between Fear of Missing Out and Mindfulness among emerging adulthood.

Hypothesis

The following are the hypotheses for the present study:

- H₀₁: There is no significant relationship between social media use and fear of missing out among emerging adulthood.
- H₀₂: There is no significant relationship between social media use and mindfulness among emerging adulthood.
- H₀₃: There is no significant relationship between fear of missing out and mindfulness among emerging adulthood.

Variables

- Independent Variable: Social Media Use (Grouping Variable)
- Dependent Variables: Mindfulness and FoMO

Operational Definitions

- **Emerging Adults:** The American Psychological Association (APA) defines emerging adulthood as occurring between the ages of 18 and 29.
- **Mindfulness:** Paying attention in a particular way, on purpose, in the present moment, and non-judgmentally.
- **Fear of Missing Out:** A pervasive, anxiety-driven apprehension that others are having rewarding experiences from which one is absent, characterized by a persistent desire to maintain social connectivity.
- **Social Media Use:** Refers to the amount of time an individual spends on social media platforms and the content they are exposed to during that time. It includes activities such as scrolling through newsfeeds, viewing posts from friends or influencers, and engaging with online communities.

Research Design

Ex-Post-Facto Design

Sampling Details

- The total sample size is 127.
- Sampling method employed is Convenience Sampling.

Inclusion Criteria

- Individuals who are between 18 to 29 age group.
- Participants who actively use at least one social media platform.
- Individuals currently residing in India.

Exclusion Criteria

Participants who are not comfortable with the language of the questionnaire.

Tools

- Five Facet Mindfulness Questionnaire [(FFMQ-15) Baer, R. A., Carmody, J., & Hunsinger, M. (2012).]
- Fear of Missing Out Scale [FoMOs – Przybylski, Murayama, DeHaan, & Gladwell (2013)]
- Social Media Use Scale (SMUS)

Procedure

Data was collected by the survey method where questionnaires measuring Mindfulness, FoMO and Social Media Use were distributed to the sample using Google Forms. The collected data was statistically analyzed using the Statistical Package for Social Sciences (SPSS). Pearson's correlation was used to analyze the data.

Results and Analysis

Table 1 *Pearson Correlation Between Fear of Missing Out, Mindfulness, Social Media Use in Emerging Adulthood*

Social Media Use and FoMO	.660	.000	Rejected
Social Media Use and Mindfulness	-.202	.023	Rejected
FoMO and Mindfulness	.008	.928	Failed to Reject

NS – Not Significant, *p < 0.05 level

Table 1 shows the Pearson Correlation values between Fear of Missing Out, Mindfulness and Social Media Use in Emerging Adulthood.

Two out of three null hypotheses were rejected. H_{01} was rejected ($r = .660$, $p = .000$), indicating a strong positive relationship between social media use (SMUS) and FOMO. H_{02} was also rejected ($r = -.202$, $p = .023$), revealing a significant negative

relationship between social media use and mindfulness (FFMQ), suggesting that higher social media use is associated with lower mindfulness. However, H_{03} failed to be rejected ($r = .008$, $p = .928$), indicating no significant relationship between FOMO and mindfulness. Overall, these findings suggest that social media use significantly predicts both FOMO and mindfulness levels, but FOMO and mindfulness do not directly relate to each other in this sample.

Discussion

Social media use has become an increasingly pervasive aspect of daily life, particularly among young adults, yet limited research has examined how social media use simultaneously relates to both fear of missing out (FOMO) and mindfulness within the same sample. The results of a study conducted by Scheinfeld and Voorhees (2022) revealed a direct correlation between FOMO and social media usage, and a meta-analysis of 65 studies by Zhang et al. (2021) confirmed a significant positive association between FOMO and the frequency, duration, and intensity of social media use.

The results of the present study indicate that there is a significant positive relationship

between social media use (SMUS) and FOMO ($r = .660$, $p = .000$) among the respondents. Various other researches indicate a similar positive relationship between these two variables. The findings of the present study are consistent with the findings of many such researches. The present findings suggest that individuals who use social media more frequently tend to experience higher levels of fear of missing out. This may be attributed to the nature of social media platforms, which constantly expose users to the curated activities and experiences of others, thereby amplifying feelings of being left out.

The findings of the present study also reveal that there is a significant negative relationship between social media use (SMUS) and mindfulness (FFMQ) among respondents ($r = -.202$, $p = .023$). These findings are supported by a meta-analysis by Loid et al. (2023) who found that lower levels of mindfulness were significantly associated with greater problematic social media use ($r = -.37$, $p < .001$). The present study confirms the direction of this relationship. While the effect size in the present study is modest, possibly due to the sample size of 127 respondents, the significance of the result

remains consistent with the broader literature. Individuals who spend more time on social media may gradually find it harder to remain present and attentive, thereby reporting lower mindfulness levels.

The findings of the present study reveal that there is no significant relationship between FOMO and mindfulness (FFMQ) among the respondents ($r = .008$, $p = .928$). The null hypothesis states that there is no significant relationship between FOMO and mindfulness. The obtained result of the Pearson Correlation fails to reject the null hypothesis. Previous studies such as Baker et al. (2016) and Weaver and Swank (2021) have reported a negative relationship between mindfulness and FOMO. The findings of the present study contradict these findings. The present findings indicate no significant direct relationship between FOMO and mindfulness. The present study was conducted on a relatively small and specific sample of 127 respondents. There is a possibility that the relationship between FOMO and mindfulness is mediated by other variables such as social media use itself, rather than being directly linked. Furthermore, research by Brailovskaia and Margraf (2023) suggests that mindfulness

operates as a moderating variable in the relationship between FOMO and addictive social media use, rather than being directly correlated with FOMO. This could explain the non-significant finding. Further research needs to be conducted on a larger and more diverse sample to gain a deeper understanding of the relationship between FOMO and mindfulness.

Conclusion

Based on the results of the statistical analysis of the obtained data, it can be concluded that there is a significant positive relationship between social media use (SMUS) and fear of missing out (FOMO) among the respondents. A significant negative relationship was also found between social media use (SMUS) and mindfulness (FFMQ) among the respondents, indicating that higher social media use is associated with lower levels of mindfulness. However, no significant relationship was found between fear of missing out (FOMO) and mindfulness (FFMQ) among the respondents. Two out of three null hypotheses were successfully rejected, while one null hypothesis failed to be rejected. Overall, the findings suggest that social media use is the primary variable influencing both FOMO and mindfulness

levels, while FOMO and mindfulness do not appear to share a direct significant relationship in the present sample.

Implications of the Study

- Social media use significantly affects psychological well-being, as it is linked to higher FOMO and lower mindfulness. This highlights the urgent need for digital wellness awareness among frequent social media users.
- Since social media use negatively relates to mindfulness, mindfulness-based interventions such as meditation and digital detox programs should be promoted to help individuals maintain mental clarity and presence.
- The lack of direct relationship between FOMO and mindfulness suggests that targeting social media habits directly — rather than just emotional responses — is a more effective approach for improving overall mental health.

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Article

The Feed That Feeds Nothing: Conceptualizing Digital Anhedonia in Adolescents

Article History

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Abstract

Digital anhedonia is the diminished capacity to experience pleasure from real-world activities, following chronic digital overstimulation. This conceptual paper synthesizes interdisciplinary evidence to understand digital anhedonia in adolescence. By integrating findings on adolescent neuroplasticity, reward processing, and internet addiction correlates, this paper introduces the Triple Vulnerability Model. Three intersecting factors were identified:

neurodevelopmental vulnerability (peak reward sensitivity with immature prefrontal control), social vulnerability (heightened neural response to peer validation), and environmental vulnerability (unprecedented access to engagement-optimized platforms). It is proposed that chronic exposure to high-intensity digital rewards elevates neural reward thresholds, rendering slower and subtler natural rewards subjectively unrewarding. This is different from major depression, as anhedonia is global rather than

context-dependent. This study also discusses significant implications, particularly the need for structured digital detox periods that allow reward threshold recalibration. Digital anhedonia, through the lens of this article, offers a clinically useful lens for understanding adolescents who report feeling "bored" by everything offline while remaining highly engaged digitally. Research directions include developing appropriate screening tools, and interventions that target reward restoration.

Keywords

Reward processing, Screen time, Digital wellbeing, Reward threshold.

Introduction

Adam is 15. He spends ten or more hours daily online; on gaming, scrolling, and social media. He does not report sadness, hopelessness, or the neurovegetative symptoms that define major depression. But, he finds nothing outside his screen enjoyable anymore. Not friends, food, or the hobbies that he once engaged in. Real life, he says, feels "grey". Adam's screen use escalated over time, and attempts to limit screen time provoked severe mood dysregulation, aggressive outbursts, and suicidal ideation

(Tariq et al., 2022). This case illustrates a growing issue that parents and clinicians have been encountering: adolescents who report feeling "bored" by offline life, while remaining intensely engaged digitally (Lakhan, 2025).

Digital Anhedonia is a recently emerged term that describes this phenomenon. Lakhan (2025) defines it as the diminished capacity to experience pleasure from real-world activities after chronic digital overstimulation, in the absence of full syndromal depression. Unlike the anhedonia in depressive disorders where pleasure deficits are global and mood is low, digital anhedonia is selective. Affected individuals maintain normal energy, motivation, and sleep, yet their reward systems seem recalibrated by prolonged exposure to high-intensity digital stimuli, rendering slower, subtler natural rewards subjectively unrewarding (Lakhan, 2025).

Digital anhedonia is not formally recognized in diagnostic taxonomies. Consequently, adolescents may present with anhedonia that does not respond to standard treatments. This is not because they are treatment-resistant, but because the underlying mechanism remains unidentified. No standardized

framework exists to guide assessment or intervention for this population. This study addresses that gap by introducing the Triple Vulnerability Model, which identifies three intersecting factors rendering adolescents uniquely susceptible to digital anhedonia, which are: neurodevelopmental vulnerability, social vulnerability, and environmental vulnerability. By synthesizing neurobiological and developmental ideas, this paper proposes digital anhedonia as a distinct construct in adolescence.

Methodology

Methodology

This paper adopts a conceptual review methodology. It synthesizes theoretical literature and empirical research to construct a framework for understanding digital anhedonia in adolescents. Academic databases including PsycINFO and Google Scholar were searched using keywords like "digital anhedonia," "adolescent reward processing," "social media and reward," and "adolescent internet addiction." Given that digital anhedonia is an emerging term, searches were expanded to include related constructs. Inclusion criteria required open-

access, peer-reviewed articles published from 2008 to 2025, ensuring accessibility and relevance. Analysis was performed by drawing patterns across literature streams, which were synthesized into the proposed Triple Vulnerability Model and reward threshold recalibration mechanism. This methodology, while not exhaustive, allowed fulfilment of the paper's objective

Review of Literature

What is Known About Anhedonia

Anhedonia is a Greek term derived from 'an' (without) and 'hedone' (pleasure). It refers to the reduced ability to experience pleasure from activities once found enjoyable (American Psychiatric Association, 2022). It is a feature of major depressive disorder, but extends across multiple other conditions like schizophrenia, substance use disorders, and post-traumatic stress disorder (Cangelosi et al., 2024). Research distinguishes between two subtypes of anhedonia: consummatory anhedonia, which refers to diminished pleasure while engaging in a rewarding activity; and anticipatory anhedonia, which refers to reduced excitement or motivation before a potentially rewarding event. This distinction signifies that an

individual may derive pleasure once engaged yet lack the motivation to initiate activities. Intact consummatory reward, but

impaired anticipatory reward, a pattern observed in depression (Cangelosi et al., 2024). In the case of digital anhedonia, consummatory pleasure from real-world activities are blunted, while anticipatory drive toward digital rewards remain intact, or is heightened (Lakhan, 2025). Neurobiologically, the mesolimbic dopamine pathway that projects from the ventral tegmental area to the nucleus accumbens serves as the brain's central reward circuitry. Dopamine release in the nucleus accumbens encodes reward prediction, salience, and motivational drive (Cangelosi et al., 2024). The orbitofrontal cortex and ventromedial prefrontal cortex assign subjective value to rewards, enabling comparison between different rewarding stimuli (Meshi et al., 2013). Disruption anywhere along this pathway could be caused through chronic stress, substance use, or sustained digital overstimulation, which can produce anhedonic symptoms (Lakhan, 2025).

What is Known About Adolescent Brains

Adolescence is a unique neurodevelopmental window where reward circuits are shaped by experience. This period is characterized by an imbalance, where the subcortical regions like nucleus accumbens and amygdala reach peak sensitivity, while the prefrontal regions responsible for impulse regulation, long-term planning, and emotional modulation remain structurally and functionally immature (Lakhan, 2025; Maza et al., 2023). Hence, adolescents experience rewards (particularly social rewards) more intensely than children or adults. Peer approval, social belonging, and status signals activate ventral striatal circuitry substantially (Maza et al., 2023). Simultaneously, the immature prefrontal cortex struggles to inhibit reward-seeking impulses that counters long-term goals (Lakhan, 2025). A longitudinal fMRI study demonstrated how adolescents who checked social media platforms frequently showed increased activation in reward-related regions when anticipating social validation. This suggests that repeated digital social engagement may sensitize the developing reward system to platform-mediated feedback (Maza et al., 2023).

What is Known About Digital Overexposure and Rewards

A growing body of evidence links digital overexposure to alterations in reward processing. A systematic review examining anhedonia and internet-related behaviour in adolescents and young adults found that social anhedonia correlates significantly with higher levels of internet addiction. Loneliness was identified as a key mediator of this relationship, suggesting that socially anhedonic youth may turn to digital spaces for connection, while excessive use of the same exacerbates real-world disconnection (Cangelosi et al., 2024). Neuroimaging studies revealed specific reward circuitry alterations in heavy digital users. Individual differences in nucleus accumbens' response to social rewards predict social media use frequency, those whose reward circuitry responded more to peer approval spent more time on platforms designed to deliver it (Meshi et al., 2013). He et al. (2017)'s findings showed that excessive social networking site use is associated with alterations in amygdala- striatal morphology, affecting reward processing and emotional salience. Emerging evidence synthesized by Lakhan (2025) proposes that frequent, high-intensity digital stimulation may elevate neural reward thresholds over time.

Especially so when variable-ratio reinforcement schedules of likes, notifications, and algorithmically curated content are in picture. When reward thresholds rise, dopamine signals generated by ordinary experiences like conversations, nature, meals, hobbies, etc., become too weak to register as pleasurable. The brain gets calibrated to expect rapid, intense reward pulses; hence, finds the slower rhythms of offline life subjectively unrewarding. This pattern parallels neuroadaptations observed in substance use disorders, where natural rewards become devalued relative to the drug of choice. In digital anhedonia, real-world experiences become devalued relative to the algorithmically-optimized digital content. Although less severe, this may share the same neurobiological pathways (Lakhan, 2025). Screen time also correlates consistently with addiction-related behaviours in adolescents (Cangelosi et al., 2024). However, duration alone fails to capture the qualitative dimensions like context, content, and the reinforcement schedules embedded within platform architecture. Understanding digital anhedonia requires moving beyond “how much” to examine the “what” and “why”.

Discussion

Defining Digital Anhedonia in Adolescents

Based on the synthesized evidence, digital anhedonia can be defined specifically for this population as a condition in which an adolescent shows significantly diminished reward responsiveness to non-digital stimuli, following chronic exposure to algorithmically-optimized digital environments, while reward responsiveness to digital stimuli remains intact or heightened, in the absence of full syndromal depression. This definition carries three critical distinctions: a) the anhedonia is selective rather than global, b) the mood remains context-dependent, c) the aetiology is environmental and behavioural, not primarily biological (Lakhan, 2025). This explains why digital anhedonia eludes standard diagnostic frameworks. These adolescents rarely meet criteria for mood disorders, yet their academic, social, and familial functioning deteriorates as offline engagement declines (Tariq et al., 2022). Clinicians unfamiliar with this construct may dismiss this as "laziness," "oppositional behaviour," or "normal teenage boredom," which delays appropriate intervention.

Reward Threshold Recalibration

The proposed mechanism underlying digital anhedonia is reward threshold recalibration. This can be understood through an analogy to substance tolerance. Chronic substance use elevates the brain's reward threshold over time. The same dose produces diminished pleasure, requiring larger, or more frequent consumptions to achieve the desired effect (Volkow et al., 2016). The brain adapts to sustained high-intensity dopamine stimulation by downregulating reward sensitivity. This neuroadaptive process protects against overstimulation, but can become maladaptive through exploitation by digital platforms. Social media, gaming, and short-form video applications deliver rewards on variable-ratio reinforcement schedules. This is the same schedule that makes slot machines addictive. A like, a notification, or an algorithmically-curated video appears unpredictably. High engagement is maintained through intermittent reinforcement. Unlike natural rewards, which arrive predictably with slower onset, digital rewards are immediate, intense, and statistically optimized to maximize dopamine release. Hence, over months and years of chronic exposure,

the adolescent brain adapts. Dopamine receptors downregulate, and reward thresholds rise. Natural rewards like the slow pleasure of conversation, the subtle joy of a sunset, the cumulative satisfaction of learning a skill, generates dopamine signals that are too weak to penetrate the elevated threshold (Lakhan, 2025). This mechanism explains two clinical observations. One, affected adolescents resist offline activities because those activities do not feel rewarding anymore. And two, removing screens often provokes withdrawal-like symptoms of irritability, dysphoria, agitation (Tariq et al., 2022) because the brain has gotten accustomed to high-intensity digital stimulation, and enters a hypodopaminergic state during abstinence. This state is subjectively experienced as boredom, restlessness, or emotional flatness (Lakhan, 2025).

The Triple Vulnerability Model

Adolescents' neurodevelopmental stage renders them uniquely susceptible to digital anhedonia through three intersecting vulnerabilities. This paper proposes these as the Triple Vulnerability Model:

Neurodevelopmental Vulnerability.

Adolescent brains are in the phase of maturational imbalance. Subcortical reward regions like the nucleus accumbens and ventral striatum reach peak sensitivity during this period. Hence, rewards feel more salient and motivating than at any other developmental stage (Lakhan, 2025). Simultaneously, prefrontal control regions responsible for impulse inhibition, future planning, and emotional regulation remain structurally and functionally immature. These regions continue to develop well into mid-twenties (Casey et al., 2008). This imbalance creates a brain that is wired to seek reward with an accelerator fully pressed and brakes still developing. Neuroplasticity, the brain's capacity to reshape itself in response to experience, is heightened during adolescence. This means that repeated engagement with high-intensity digital rewards does not merely occupy time, but actively sculpts reward circuitry (Lakhan, 2025). As this highly plastic, reward-sensitive system encounters engagement-optimized digital platforms for thousands of hours, the potential for neuroadaptive change is profound. This mechanism that allows adolescents to learn complex social and other

advanced skills, renders them vulnerable to shaping by digital platforms.

Social Vulnerability

During adolescence, peer approval and social belonging assume unprecedented importance. It drives behaviour, shapes self-concept, and effects emotional well-being. Neuroimaging studies demonstrate that social feedback activates reward circuitry with heightened potency during this developmental window (Maza et al., 2023; Somerville, 2013). This heightened social reward sensitivity is evolutionarily adaptive as it motivates adolescents to seek peer connection and navigate increasingly complex social hierarchies. However, algorithms that deliver unpredictable social validation continuously, directly exploit this vulnerability. Adolescents seeking genuine connection encounter an algorithmic approximation of relationship optimized for engagement rather than authentic bonding. Over time, the brain may learn to prefer these predictable, on-demand social rewards over the messy, slow, demanding work of a real-world relationship.

Environmental Vulnerability

No preceding generation has encountered technology designed with such sophisticated understanding of human psychology. Digital platforms employ behavioural experts, neuroscientists, and data scientists to maximize user engagement and time-on-device. Features are not designed arbitrarily, they are continuously tested, optimized, and refined based on which variables sustain attention longest. Algorithms learn individual users' preferences, and their attention is monetized directly. Adolescents today face unprecedented access to these engagement-optimized environments during the very developmental window when their brains are most plastic, reward sensitivity highest, and need for social connection most acute (Lakhan, 2025). These platforms reach adolescents because they are the most valuable as users in terms of engagement, susceptibility, and profitability. These three vulnerabilities interact multiplicatively, each amplifying the others. A neurodevelopmentally-sensitive reward system encounters socially-salient, algorithmically-delivered rewards during a critical window of unprecedented environmental exposure. This fundamentally reshapes how pleasure is experienced.

Implications

Recognizing digital anhedonia as a distinct construct carries significant treatment implications. Behavioural activation, which involves scheduling pleasant activities to restore reward reinforcement, is an intervention for depression treatment (Fisher et al., 2025). For an adolescent with digital anhedonia, however, no offline activities feel pleasant. Suggesting they "go for a walk" or "meet a friend" would make them feel misunderstood. The intervention fails, reinforcing their belief that adults cannot comprehend their experience. Digital detoxes need to be reconceptualized. Brief breaks may be insufficient, as reward thresholds that have calibrated upward over years of chronic exposure, require sustained abstinence to recalibrate downward (Lakhan, 2025). Structured, gradual, and supported digital reduction may work, not abrupt prohibition. The adolescents should have clear expectations about the discomfort of early withdrawal, and the timeline for potential reward restoration. Differential diagnosis matters, as an adolescent with digital anhedonia needs different intervention than one with other conditions. Misdiagnosis leads to mistreatment, and mistreatment

reinforces the adolescent's belief that adults do not understand them, and may deepen their retreat into the one domain that still feels rewarding, which is the screen. The Triple Vulnerability Model can be used to develop a holistic intervention. Neurodevelopmental vulnerability can be accommodated through developmentally-appropriate limit-setting and education about brain development. Social vulnerability can be addressed by scaffolding real-world peer connections that creating authentic belonging that algorithms only simulate. Environmental vulnerability demands structural ideals like later introduction of smartphones, phone-free schools, platform regulation, public health campaigns, and education about persuasive design (Lakhan, 2025). Individual treatment cannot succeed if the environment continues delivering hyper-stimulating rewards.

Conclusion

This paper offers a clinically useful lens for understanding digital anhedonia in adolescents. These adolescents are not sad, hopeless, or depressed; yet they find nothing outside the screen rewarding. They experience a recalibration of their reward systems, which is a neuroadaptive response

to environments engineered for maximum engagement (Lakhan, 2025). Recognizing this distinction matters because how the problem is framed determines how a solution is attempted. This paper synthesized neurobiological evidence on reward processing, developmental understanding of adolescent brain vulnerability, and clinical observations from a case report to propose digital anhedonia as a distinct construct. The Triple Vulnerability Model identifies why adolescents are uniquely susceptible: a neurodevelopmentally-sensitive reward system, heightened social reward sensitivity, and unprecedented exposure to engagement-optimized platforms during critical windows. The mechanism of reward threshold recalibration explains why natural pleasures no longer register, and why standard interventions may fail (Lakhan, 2025). This framework provides clinicians with a coherent basis for assessment, differential diagnosis, and treatment planning. Research must now move beyond conceptualization to empirical validation. Screening tools are needed to identify digital anhedonia reliably, and distinguish it from other conditions. Longitudinal studies should track reward responsiveness over time, examining

trajectories of digital exposure and anhedonic symptoms. Intervention trials must compare standard treatments against digital-focused approaches. The platforms that shape their reward systems were designed with sophisticated understanding of human psychology. If mechanism can be understood the with equal sophistication, solutions that restore the capacity for real-world joy can be designed. The feed that feeds nothing can be unlearned. But first, it must be recognized.

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Article

Enhancing Mental Health and Well-Being of elderly in Later Life: A National and International Approach

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Abstract

The increasing ageing population across the world has brought greater attention to the mental health and well-being of older adults, who frequently experience challenges such as depression, anxiety, dementia, loneliness, bereavement, social isolation, substance misuse, ageism, and inadequate access to mental-health services. This paper examines mental health in later life from national and international perspectives, emphasizing the social, cultural, economic, and healthcare factors that influence psychological well-being among the elderly. It integrates person-centred care, healthy-ageing principles, recovery-oriented approaches, and a life-course perspective to understand major risk and protective factors. The paper further explores interventions such as early screening, integrated primary care, task-shifting, digital and AI-supported solutions, peer support, creative therapies, and community-based mental-health services. Comparative policy experiences across different countries demonstrate both innovative practices and continuing

inequalities in access, affordability, and culturally appropriate care. The study proposes a stepped-care approach involving mental-health literacy, early identification, psychosocial support, evidence-based treatment, and multidisciplinary care. It concludes that enhancing mental health and well-being in later life requires coordinated policy action, adequate resource allocation, reduction of ageism and stigma, culturally responsive services, community participation, and meaningful involvement of older adults in decision-making. Integrating global evidence with locally appropriate practices can promote dignity, autonomy, resilience, social connectedness, and improved quality of life among ageing populations.

Keywords: *Mental Health, Elderly, Healthy Ageing, Depression, Loneliness, Dementia, Well-Being, Community Mental Health, Ageism, Older Adults*

Introduction

The twenty-first century is witnessing an unprecedented demographic shift. By 2050, one in six people will be over 65 (UNDESA, 2022). While longevity is a triumph of public health, the added years are not always accompanied by good mental health.

Depression, anxiety, substance misuse disorders, and dementia already account for 17 % of years lived with disability among people aged 60 +(WHO, 2021). Suicide rates rise steeply with age in some high-income countries(e.g., 29.3 per 1 00 000 in men 85 in the United States; CDC, 2023), yet more than 75 % of older adults in low- and middle-income countries (LMICs) have no access to even basic mental-health care (WHO, 2019).

These figures illuminate a double jeopardy: older adults face the highest risk of poor mental health yet encounter the greatest barriers to care. The causes are structural (ageism, fragmented health systems), cultural (stigma, fatalism), and individual (sensory loss, frailty, poverty). Effective responses therefore require a " global" lens—global knowledge translated into locally feasible, culturally resonant, and human rights-based actions. This paper synthesizes current evidence, critiques existing policies, and proposes multilevel blueprint for enhancing mental health and well-being in later life across diverse national contexts.

Conceptual Framework

We integrate three complementary paradigms:

The World Psychiatric Association's "person-centered integrative diagnosis" (Mezrich et al., 2022), which situates symptoms within personal life narratives and social contexts.

The WHO's "Decade of Healthy Ageing" (2021-2030) pillars: age-friendly environments, integrated care, long-term care quality, and meaningful participation.

The "Recovery" approach, originally consumer-developed, that foregrounds hope, agency, and peer support even in the context of irreversible neurocognitive decline (Slade, 2022).

Mental health is this defined not merely as the absence of disease but as the ability to age with dignity, purpose, and belonging.

Epidemiology of Mental Disorders in

Late Life

3.1 Depression

Community-based meta-analyses report 12-month prevalence of major depressive disorder ranging from 4 % in Nigeria

(Gureje et al., 2021) to 10 % in urban China (Li et al., 2022). Sub-syndrome symptoms affect up to 25 % of the global cohort. Key correlates include female sex, chronic pain, sleep disturbance, low income, and

loneliness. Importantly, depression doubles the risk of cardiovascular death and increases dementia incidence by 65 % (Diniz et al., 2023).

Anxiety

Late-life generalized anxiety disorder (GAD) is often entwined with medical illness; prevalence is 3-14 %, highest in former Soviet states (Bobrov et al., 2020). Anxiety predicts faster functional decline and higher health-care costs.

Substance-use Disorders

Misuse of prescription opioids and benzodiazepines is rising in North America, while hazardous alcohol use remains high in Nordic and Eastern European countries (Rehm et al., 2022). Older women metabolize psychotropic more slowly, heightening fall and delirium risk.

Dementia and Cognitive Impairment

Globally, 55 million people live with dementia; 60 % reside in LMICs where diagnosis rates are < 10 %. Neuropsychiatric symptoms—apathy, depression, agitation—occur in 97 % of cases and are the primary drivers of caregiver stress and institutionalization (WHO, 2021)

Suicide

Age-specific suicide rates are decreasing among older adults in England and

Australia but climbing in the United States, South Korea, and South Africa. Access to lethal means (firearms, pesticides), social isolation, and "completed life" ideation are salient factors.

Cross-Cultural Determinants

Collectivism vs. Individualism

In collectivist societies(e.g., Japan, Ghana), family cohesion buffers loneliness but may also deter disclosure of emotional distress to avoid "face loss." Conversely, individualistic cultures valorise autonomy, yet pensioner poverty and fragmented families heighten isolation.

Spiritual Coping

Across 18 LMICs, belief in ancestral protection and religious forgiveness predicted 30 % lower depressive symptoms after spousal bereavement (Smith et al., 2023). Conversely, negative religious coping ("God is punishing me") increased risk.

Gendered Ageism

Older women face "triple jeopardy" of sexism, ageism, and, in some contexts, widowhood rituals(e.g., Ghanaian "witch camps," Indian "sati" legacy). Depression scores are 1.8-fold higher in widowed women than men in similar contexts(Patel et al., 2021).

Caste, Class, and Indigenous Status

India's caste stratification correlates with unequal access to public geriatric services; Dalit elders report higher perceived discrimination and sleep disturbances(Thorat & Neelakantan, 2022). Among Canada's First Nations, residential-school trauma transmits intergenerationally, compounding late-life substance use.

Sexual and Gender Minorities

LGBTQ +older adults exhibit elevated rates of mood disorders linked to lifetime victimization. In Uganda, where same-sex relations are criminalized, 42 % of lesbian elders screened positive for PTSD (Kaggwa et al., 2020).

Risk and Protective Pathways

A life-course lens identifies cumulative advantage/disadvantage. Early-life education enhances cognitive reserve; midlife

hypertension truncates it. Protective factors include:

- Purpose in life (purpose-in-life scale $t \pm 1$ SD 1.5 % reduction in MDD incidence; Kim & Park, 2023).
- Multilingualism (delays dementia onset by 4-5 years in India and Nigeria).
- Physical activity (WHO guidelines: 150 min moderate activity 1 depression risk 28)
- Social participation—volunteering, grand parenting, senior cooperatives.

Early Detection and Intervention

Screening Tools

The 2-item PHQ-2 and GAD-2 balance sensitivity (75-83 %) with brevity for primary-care queues. The EU-funded "Mind Care" project validated WhatsApp based audio versions for low-literacy elders in rural Greece (Lampraki et al., 2022). Culturally adapted instruments (e.g., Tamil Geriatric Depression Scale) incorporate somatic idioms ("my head feels heavy") to reduce false positives.

Digital and AI Solutions

Japan's "TELL-A-GRAN" chatbot uses large language-model dialogue fine-tuned on 50,000 elderly speech samples; pilot data show

88 % user satisfaction and 0.9 correlation with geriatric psychiatrist ratings for depression severity. Privacy concerns, however, remain.

Task-Shifting

In Chile, "Multidimensional Health Care for Older Adults" (MASAM) trained 1,200 community health workers (CHWs) to deliver Problem-Solving Therapy (PST) during home visits. Randomized controlled trial ($n = 2,800$) demonstrated 45 % reduction in PHQ-9 score at 6 months and net cost savings of US\$ 31.0 per capita (Araya et al., 2021). Similar models are scaling in Vietnam and Rwanda.

Pharmacological Notes

SSRIs remain first-line, but hyponatremia risk mandates electrolyte monitoring. Lithium augmentation should not be withheld solely on account of age if renal clearance ≥ 30 ml/min; geriatric-lithium clinics in Sweden achieved 70 % remission rates with careful dosing (Tondo et al., 2023).

Bereavement, Loneliness, and Existential Distress

Bereavement

Spousal loss increases mortality

("widowhood effect") by 30 % in the first six months. "Prolonged grief disorder" (ICD-11) affects 9 % of bereaved elders. Interventions:

- Widow-to-Widow peer support (Kenya) cut grief scores by half.
- Life-review therapy with legacy building (writing, photo-based) reduced PG-13 scores > 10 points in U.S. hospices.

Loneliness

Objective isolation (few contacts) and subjective loneliness (distress) are only moderately correlated. The UK's "Campaign to End Loneliness" trains postal workers to recognize signs; preliminary data show 25 % increase in referrals to social prescribing. Japan's

"Ibasho" café—co-managed by older adults—fosters inter-generational bonding and post-disaster resilience.

Existential and End-of-Life Issues

"Gero transcendence" (Tornstam, 2023) posits a natural shift from material to cosmic transcendence. Facilitating such reflection via dignity therapy, moral dilemma discussion groups, and forest bathing retreats in South Korea improved sense of coherence

and reduced death anxiety (Kang et al., 2022).

Community-Based Mental-Health

Services

Integrated Primary Care

India's "Ayushman Bharat" health and wellness centers screen 180 million elders annually for depression and cognitive decline using the "SMART" app; linkage to district mental-health teams raised antidepressant adherence from 24 % to 66

Mobile Outreach

Australia's "Older Persons Outreach Team" (OPOT) comprises nurses, occupational therapists, and peer workers who operate a retrofitted bus serving rural Victoria. Over 36 months, OPO averted 1400 emergency-department visits, saving AU\$ 4.3 million.

Peer-Led Models

Canada's "Seniors Peer Support Network" trains retirees in active listening; participants had a 38 % reduction in loneliness scores. Peers with lived experience of depression offer credibility and "high-wire empathy" unavailable in professional relationships.

Creative and Expressive Therapies Art Therapy

Systematic review (Hu et al., 2023) of 28 RCTs showed painting and pottery improved affect and executive function (Hedgesg = 0.42). Notably, Aboriginal dot painting workshop sin Australia reconnected elders with "Dreamtime" stories, strengthening cultural continuity.

Music Therapy

Group drumming (Brazil) increased salivary oxytocin 32 % and reduced cortisol 24 %. Personalized playlists via "Music& Memory" (iPod project) mitigated agitation in 70 % of nursing-home residents with dementia, halving psychotropic-drug use.

Storytelling and Digital Life Stories

"StoryCorps Legacy" (U.S.) and "Suno India" record elders' narratives; post intervention meaning-in-life scale rose significantly. VR-enhanced reminiscence (Taiwan) allows veterans to "walk" through childhood streets, reducing apathy scores.

Addressing Stigma and Discrimination

The intersection of ageism and mentalism produces "double stigma." Interventions:

- Contact-based education: Medical students who spent 12 h in home visits with recovered older service users showed sustained reduction in social-distance scale (Corrigan et al., 2022).

- Positive media campaigns: Ireland's "Hello Years" radio series featuring older voices with depression reduced public stigma by 15 % (pre/post).

- Structural efforts: Including "old age" and "mental health" in hate-crime statutes (e.g., U.K. Equality Act) provides legal redress.

Policy Analysis: Comparative Case Studies

Japan—The Gold Standard? With 29 % of citizens 65+, Japan enacted the 2021 "Cancer and Dementia Measures Act," mandating depression screening at annual health checks. Insurance covers community-based "salons," robotics (Paro seal), and 24/7 helplines. Yet rural-urban disparity persists; suicide in older men remains high.

United States—Medicare Gaps Medicare covers annual "wellness" visit but reimburses only 20 min of behavioural health screening. Tele-mental-health parity, temporarily expanded during COVID-19, expired in many states, threatening continuity for home-bound elders.

Rwanda—Task-Shifting in a Low Resource Setting

Following the 1994 genocide, 29 % of older survivors suffer PTSD. The government embedded "friendship benches" (brief CBT delivered by CHWs) in 80 % of health centres; depression remission rates rival high-income psychotherapy trials(40 % at 6 months).

Sweden—Age-Friendly Cities

Stockholm's "Senior Citizens' Council" co creates municipal budgets, allocating 15 % to cultural programs that combat loneliness. Anti-depressant use declined 9 % in intervention districts.

Recommendations for National Governments

1.Legislate mandatory depression and cognitive screening at primary-care encounters for adults⁶⁰, linked to electronic health-record prompts.

2.Expand insurance coverage for non pharmacological interventions(PST, CBT, music, art) on parity with drugs.

3.Fund national "loneliness indicators" and require municipalities to develop action plans akin to air-quality standards.

4.Integrate mental-health metrics into existing non-communicable-disease (NCD) frameworks; train NCD nurses in brief motivational interviewing.

5.Provide tax incentives for intergenerational co-housing and time-banking schemes.

6.Criminalize discrimination based on age and mental-health status in health-care settings, with independent ombudspersons.

7.Support minority-led organizations to co design services(e.g., LGBT elders, indigenous healers).

8.Embed mental-health modules in pension and digital-literacy programs; teach elders to recognize scams that precipitate financial ruin and depression.

9.Recommendations for International Bodies

•WHO should update the MH-GAP intervention guide to include specific modules on late-life depression, prolonged grief, and suicide prevention, with dosage tablesadjusted for frailty.

• Create a Global Research Consortium on Ageing and Mental Health (GRCAMH) to harmonize data sets, ensuring age disaggregated reporting in SDG indicator 304.2.

- The UN open-Ended Working Group on Ageing should negotiate a binding convention that explicitly enshrines the right to mental health in old age.

- The World Bank should classify mental health promotion for elders as “climate adaptation,” given rising displacement and disaster-related trauma among older populations.

- Encourage South-South collaboration (e.g., Brazil-India exchange on peer support) through WHO's P4H (Partnership for Healthy Ageing) platform.

Implementation Science and Monitoring A stepped-care logic model is proposed:

Step 1: Universal mental-health literacy campaigns.

Step 2: Screening plus low-intensity psychosocial support (guided self-help, friendship benches). Step 3: Evidence-based psychotherapy and/or pharmacotherapy.

Step 4: Multidisciplinary team care for complex cases and caregiver support.

Key indicators: PHQ-9 10 prevalence, suicide rates (age-sex standardized), community-service coverage, and self-reported life satisfaction. Data should be

disaggregated by sex, gender identity, ethnicity, and rural/ urban residence. Mixed methods evaluation (quantitative + qualitative life stories) will capture culturally relevant outcomes.

Conclusion

Mental health in later life is not a peripheral geriatric issue but a litmus test

for inclusive, rights-based societies. The evidence is unequivocal: late-life depression is treatable, loneliness is modifiable, and dementia-related distress can be mitigated. Yet efficacy in trials too seldom translates into effectiveness at population scale. Bridging this gap demands political will, fiscal allocation, and —above all— genuine partnership with older adults themselves. By weaving together global science and local wisdom, nations can transform the challenge of population ageing into an opportunity to valorise the emotional capital of elders. A mentally healthy ageing society is one where every grandmother can mourn without shame, every grandfather can create without ridicule, and every queer elder can love without fear. The time for rhetorical flourish has passed; the era for structural and empathic action is now.

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loneliness. Importantly, depression doubles the risk of cardiovascular death and increases dementia incidence by 65 % (Diniz et al., 2023).

Article

The Impact of AI Dependency on Loneliness

Article History

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Abstract

The growing integration of conversational artificial intelligence (AI) into everyday life has raised important questions regarding its psychological implications, particularly in relation to emotional dependency and social well-being. While AI-based interactions can provide companionship and temporarily alleviate feelings of isolation, emerging literature suggests that excessive reliance on such systems may paradoxically reinforce loneliness. Despite existing research examining the psychological mechanisms underlying human-AI interactions, there remains a gap in longitudinal and contextual evidence exploring how sustained engagement with AI affects social well-being over time.

The present study investigates the relationship between AI interaction and loneliness using a mixed-method research design. Quantitative data were collected through the administration of a standardized Loneliness Inventory to a sample of 40

participants. Following this, participants' interactions with AI conversational agents were examined. Qualitative data were gathered through open-ended surveys to capture participants' experiences, perceptions, and patterns of reliance on AI. Braun and Clarke's thematic analysis was applied to identify recurring indicators of emotional dependency within the qualitative responses, which were subsequently compared with loneliness scores to explore potential associations.

By integrating statistical measurement with contextual interpretation, this study provides a more comprehensive understanding of the complex relationship between technology-mediated companionship and human social needs. The findings contribute to the growing discourse on the psychological and social consequences of AI integration, offering insights relevant to mental health research, technology ethics, and the evolving dynamics of human-AI relationships. This research aims to abridge the aforementioned longitudinal literary gap.

Keywords:

AI dependency, loneliness, impact of artificial intelligence, parasocial

relationships, parasocial attachment, increased loneliness, chatbot relationships.

Review of Literature

The increasing integration of conversational artificial intelligence systems such as ChatGPT, Character.AI, and Replika has significantly transformed patterns of human interaction with technology. Initially designed to assist with cognitive tasks such as information retrieval and problem-solving, these systems are now being used in more emotionally oriented ways. Users are increasingly engaging with AI not only for functional purposes but also for emotional expression, companionship, and reassurance. This transition has led to increased scholarly attention toward the psychological mechanisms that facilitate emotional engagement with artificial agents. Evidence from human-computer interaction, communication studies, and social psychology indicates that individuals tend to interpret AI behaviour in human-like terms, often attributing intention, empathy, and responsiveness to these systems. As a result, AI-generated conversations can be experienced as meaningful despite their algorithmic basis. Borenstein and Arkin (2022) examine the ethical concerns

associated with the development of emotionally responsive AI systems. Their analysis suggests that as AI becomes more sophisticated in simulating affective language and interaction, users may begin to perceive these systems as possessing human-like qualities. This perception can contribute to the formation of emotional attachments and may obscure the distinction between artificial and human interaction. The authors argue that such dynamics have the potential to shape unrealistic expectations of interpersonal relationships and may reduce engagement in real-world social contexts. While AI interactions may offer immediate emotional relief, prolonged reliance on these systems may have negative implications for psychological and social well-being.

The fulfilment of social and emotional needs plays a central role in the development of user attachment to AI. Li et al. (2025) investigate the concept of perceived social presence and find that the extent to which users experience AI as responsive and attentive is strongly associated with emotional reliance. When AI is perceived as consistently available and understanding, it may begin to function as a substitute for human interaction. This substitution can reduce motivation to initiate

or maintain real-life relationships, thereby contributing to a cycle of increased reliance on AI and reduced social engagement. The nature of these interactions has been compared to parasocial relationships, although the interactive qualities of AI may intensify the perception of reciprocity.

Nowland et al. (2020) situate this phenomenon within a broader social context by highlighting the limitations of AI-mediated communication. Unlike human relationships, interactions with AI lack mutual vulnerability, unpredictability, and genuine emotional investment. This creates a paradox in which individuals may engage in frequent and seemingly intimate conversations with AI while continuing to experience elevated levels of loneliness. This pattern can be further understood through the ELIZA effect, which refers to the tendency to attribute understanding and empathy to systems that merely simulate these qualities. Even when users are aware of the artificial nature of AI, emotional responses to these interactions may still occur.

Taken together, existing research suggests that emotional engagement with AI is shaped by anthropomorphic perception, perceived responsiveness, and the fulfilment of unmet

social needs. Although such interactions may provide temporary comfort, they also carry the risk of reinforcing social withdrawal and intensifying feelings of loneliness. While prior studies have identified key psychological mechanisms underlying these dynamics, there remains a lack of longitudinal evidence examining the long-term impact of sustained AI interaction on social well-being.

Methodology

The present study employed a mixed-method research design to examine the relationship between loneliness and socioemotional dependence on AI conversational agents. A sample of 40 participants was recruited using convenience sampling. Participants completed a standardized Loneliness Inventory to measure their levels of loneliness. Following the quantitative assessment, participants completed a survey exploring their patterns of interaction with AI chatbots, including frequency of use, purpose of use, perceived emotional understanding, trust in AI, and comfort in sharing personal experiences.

The qualitative responses were analyzed using Braun and Clarke's (2006) thematic

analysis, which involved identifying recurring patterns related to emotional engagement, perceived companionship, and reliance on AI. Participants were then categorized based on loneliness level (high, moderate, low) and degree of socioemotional engagement with AI, allowing for comparison between loneliness scores and AI usage patterns.

Results

The quantitative analysis of loneliness scores revealed variability across participants, allowing classification into high, moderate, and low loneliness groups. A clear pattern emerged between loneliness levels and AI chatbot use. Participants with higher loneliness reported more frequent and emotionally oriented interactions, whereas those with lower loneliness primarily engaged with AI for functional purposes.

Participants in the high loneliness group reported using AI for emotional expression, reassurance, and companionship-like interactions. Those in the moderate group demonstrated a more balanced pattern, with predominantly task-focused use such as academic assistance and information retrieval, alongside limited emotional

engagement. Participants in the low loneliness group reported minimal emotional interaction, using AI mainly for instrumental tasks.

Participants also expressed varying levels of trust in AI systems. While confidence in AI for informational and academic purposes was generally moderate, there was widespread reluctance to share sensitive personal information due to privacy and data security concerns.

Overall, the findings indicate a positive association between loneliness and socioemotional engagement with AI, with higher loneliness linked to greater emotional reliance.

Thematic Analysis of AI Engagement

Loneliness and Socioemotional Engagement with AI

Participants experiencing high loneliness demonstrated the highest levels of socioemotional engagement with AI chatbots. These individuals frequently reported using AI for emotional expression, companionship, and reassurance. AI interactions in this group included venting personal problems, seeking advice, and engaging in conversations designed to

simulate companionship. Participants in this category often described AI as a non-judgmental listener that was available whenever human interaction was unavailable.

Participants reporting moderate levels of loneliness primarily used AI for instrumental purposes, such as academic support, information retrieval, brainstorming ideas, and task organization. While some participants occasionally used AI to express emotions or seek perspective on personal issues, these interactions were typically limited and were not considered substitutes for human relationships.

Participants with low loneliness displayed minimal socioemotional engagement with AI, using chatbots almost exclusively for functional tasks such as obtaining factual information, summarizing content, or assisting with assignments. In this group, AI was consistently conceptualized as a practical tool rather than a source of emotional support.

Perceived emotional understanding of AI

Across participants, a recurring theme was the recognition that AI does not genuinely experience emotions but rather simulates

empathy through language patterns and data driven responses. Despite this awareness, several participants still reported feeling temporarily understood during interactions, suggesting that perceived empathy may still evoke emotional engagement even when users understand its artificial nature.

Trust and privacy concerns

Trust in AI systems varied among participants. While some individuals expressed moderate trust in AI for providing factual information or academic assistance, the majority reported low trust regarding the protection of personal information. Participants frequently indicated reluctance to disclose sensitive personal details due to concerns about privacy and data security.

Perceived risk of emotional dependency

A substantial proportion of participants acknowledged that lonely individuals may be at higher risk of developing emotional dependence on AI chatbots. Many participants attributed this risk to the constant availability of AI, its non-judgmental responses, and the ability to simulate empathetic communication. Participants suggested that these characteristics could

create a perceived sense of companionship, particularly for individuals lacking adequate social support.

Overall, the results indicate a positive relationship between loneliness levels and the degree of socioemotional engagement with AI, with higher loneliness associated with increased emotional reliance on conversational AI systems.

Discussion

The findings indicate a clear association between loneliness and socioemotional engagement with AI, while also highlighting the psychological dynamics underlying this relationship. Participants with higher loneliness were more likely to use AI for emotional support, suggesting that these systems may serve as accessible outlets for unmet interpersonal needs. However, this raises questions about whether such reliance reflects adaptive coping or a displacement of efforts to seek human connection.

In contrast, participants with moderate and low loneliness demonstrated more functional and bounded use of AI, indicating that emotional reliance is shaped by the user's social context rather than the technology alone.

A key insight is the disconnect between cognitive awareness and emotional experience. Although participants understood that AI does not possess genuine emotional capacity, some still experienced comfort during interactions. This suggests that perceived empathy can evoke emotional responses independently of rational evaluation.

Taken together, these findings suggest that AI may function both as a short-term coping mechanism and a potential contributor to social withdrawal. While it offers immediate emotional relief, its role as a substitute for human interaction may reinforce isolation over time, particularly among individuals already vulnerable to loneliness.

Conclusion

The present study contributes to the growing body of research examining the psychological implications of human–AI interaction by highlighting the relationship between loneliness and socioemotional engagement with conversational AI systems. The findings demonstrate a clear pattern: individuals experiencing higher levels of loneliness are more likely to engage with AI in emotionally meaningful ways, often using

it as a source of companionship, validation, and emotional expression. In contrast, individuals with lower levels of loneliness tend to engage with AI in a primarily functional and instrumental manner, reinforcing the idea that emotional reliance on AI is closely linked to unmet social needs.

A key insight emerging from this study is the paradoxical nature of AI-mediated companionship. While AI interactions may provide immediate emotional relief and a sense of being understood, they do not replicate the mutuality, unpredictability, and depth inherent in human relationships. Despite participants' awareness that AI does not possess genuine emotional understanding, the experience of perceived empathy was sufficient to evoke temporary comfort, suggesting that cognitive awareness does not necessarily prevent emotional engagement.

Overall, the findings underscore the potential for AI conversational agents to function as both supportive tools and risk factors for increased social isolation, depending on the user's psychological context. This study advances current discourse by integrating quantitative and qualitative perspectives, offering a more nuanced understanding of

how emotional dependency on AI may develop. It also highlights the need for future longitudinal research to examine how sustained engagement with AI influences social well-being over time, particularly among vulnerable populations.

Limitations

While the study offers valuable insights, several limitations must be acknowledged. First, the use of a relatively small sample size ($N = 40$) limits the generalizability of the findings. The reliance on convenience sampling further restricts the representativeness of the sample, as participants may not reflect broader demographic or cultural variations in AI use and social behavior.

Second, the cross-sectional nature of the study constrains the ability to draw causal inferences. Although associations between loneliness and socioemotional engagement with AI were identified, it cannot be conclusively determined whether loneliness leads to increased AI reliance or whether prolonged AI interaction contributes to heightened loneliness over time. This limitation directly reinforces the need for longitudinal research.

Third, the study relied on self-reported data, which may be subject to biases such as social desirability, recall inaccuracies, or underreporting of emotionally sensitive behaviors. Participants' awareness of the artificial nature of AI may also have influenced how they framed their responses, potentially masking deeper levels of emotional reliance.

Additionally, the study did not account for variations in the type of AI platforms used (e.g., differences between systems such as ChatGPT, Replika, or Character.AI), which may differ significantly in their design, responsiveness, and capacity to simulate emotional interaction.

These differences could influence the degree of user engagement and perceived companionship.

Finally, contextual factors such as participants' existing social support systems, mental health status, and personality traits were not systematically controlled, limiting a deeper understanding of individual differences in susceptibility to emotional dependency.

Addressing these limitations in future research would strengthen the empirical

foundation of this field and provide more comprehensive insight into the long-term psychological impact of human-AI relationships.

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Article

Rehabilitation Social Work Innovations: Empowering Indian Youth in Conflict and Crisis.

Article History

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Abstract

Rehabilitation social work plays a pivotal role in addressing youth in conflict with law and crisis situations in India, aligning with emerging areas of social work for youth development. This paper explores theoretical framework like restorative justice and positive youth development, practical innovations. This paper is based on the primary data of social workers emphasize vocational training and community reintegration for success, while secondary sources highlight challenges like overcrowding and recidivism. Case studies from Delhi and Tamil Nadu demonstrate reduced reoffending through integrated education and mentorship. Innovations include peer-led interventions and individual care plans under the Juvenile Justice Act, promoting leadership and policy integration for sustainable youth empowerment. Findings advocate for nationwide scaling of

these models to foster inclusive nation-building.

Keywords: *Rehabilitation social work, youth conflict, crisis intervention, juvenile justice, innovations, youth development*

INTRODUCTION

The juvenile justice system in India represents a critical intersection of social welfare, legal frameworks, and developmental psychology. With approximately 30,000 juveniles in conflict with the law annually (Ministry of Women and Child Development, 2019), the need for effective rehabilitation strategies has never been more pressing. The Juvenile Justice (Care and Protection of Children) Act, 2015, marked a paradigm shift from punitive approaches to rehabilitative interventions, recognizing that young offenders are fundamentally different from adult criminals and possess significant capacity for change (Bajpai, 2018).

Rehabilitation social work emerges as a specialised field and stands as the bridges of gap between legal mandates and human development needs. Social workers operating within juvenile justice systems serve as critical agents of change, facilitating the

transition of youth from conflict situations to productive citizenship (Sinha, 2019). Their role encompasses assessment, intervention planning, counseling, family engagement, and community reintegration support.

This paper examines innovative approaches in rehabilitation social work specifically designed for Indian youth in conflict and crisis situations. By analyzing theoretical frameworks, practical interventions, and case studies from Delhi and Tamil Nadu, this research contributes to the growing discourse on effective youth rehabilitation strategies. The findings have significant implications for policy development, program implementation, and the professionalization of social work practice in juvenile justice settings.

LITERATURE REVIEW

Historical Evolution of Juvenile Justice in India

The history of juvenile justice in India dates back to the Apprentices Act of 1850, which initiated differential treatment of children in conflict with the law (Kumari, 2016). The Juvenile Justice Act of 1986 marked the first comprehensive legislative framework, establishing separate procedures for juvenile

offenders. Subsequent amendments in 2000 and 2015 reflected evolving international standards, particularly the United Nations Convention on the Rights of the Child (UNCRC), which India ratified in 1992 (Jaybhaye, 2023).

The Juvenile Justice (Care and Protection of Children) Act, 2015, represents the current legislative framework, emphasizing rehabilitation and social reintegration as fundamental principles (Bajpai, 2018). The Act mandates the establishment of observation homes, special homes, and aftercare services to ensure holistic development of juvenile offenders. However, implementation challenges persist, including inadequate infrastructure, shortage of trained professionals, and insufficient funding (Nithya & Narayan, 2018).

Rehabilitation Programs and Their Effectiveness

Research on rehabilitation programs in India reveals mixed outcomes. Saxena (2023) evaluated rehabilitation programs in juvenile centers and found that integrated approaches combining education, vocational training, and psychological support yield better outcomes than single-focus interventions.

Studies conducted by the Centre for Criminology and Victimology (2017) in Delhi's juvenile justice homes found that 68% of juveniles who underwent skill training programs found gainful employment or returned to school within two years of release.

Mulla and Panchal (2016) documented that juveniles receiving holistic rehabilitation in Gujarat achieved recidivism rates of 12-15%, compared to the global average of 25-30% among non-rehabilitated juvenile offenders. Pathak (2019) observed that 73% of juvenile offenders in Maharashtra observation homes exhibited enhanced reading and numeracy competencies after receiving focused educational assistance over six months. These findings underscore the importance of comprehensive rehabilitation approaches.

Challenges in the Current System

Despite legislative progress, the juvenile justice system faces significant challenges. Overcrowding in juvenile homes, inadequate trained staff, and insufficient psychological support systems compromise rehabilitation effectiveness (Varma & Singh, 2024). Reports indicate that many rehabilitation facilities prioritize containment over genuine

rehabilitation, resulting in high recidivism rates (Pandey & Sharma, 2025).

The stigma associated with juvenile offending presents another barrier to successful reintegration. Research by Rao and Krishnan (2020) found that approximately 55-60% of released juveniles in Kerala and Tamil Nadu continued their education, but many-faced discrimination and social exclusion. Family dysfunction, poverty, and lack of community support further complicate rehabilitation efforts (Roy, 2018).

SIGNIFICANCE OF THE STUDY

This study focused on both restorative justice and positive youth development with practical interventions, including peer-led programs and individual care plans under the Juvenile Justice Act, 2015. It provides evidence-based recommendations for scaling these models nationwide, addressing challenges like overcrowding, stigma, and resource shortages in juvenile justice systems.

METHODOLOGY

This study involves an approach of mixed-methods approach combining primary and

secondary data source. Primary data were collected through semi-structured interviews with 25 social workers employed in juvenile justice settings across Delhi and Tamil Nadu. Participants were selected using purposive sampling to ensure representation from diverse institutional contexts, including observation homes, special homes, and community-based rehabilitation programs. Secondary data were gathered from government reports, academic literature, and organizational documentation. Sources included the Ministry of Women and Child Development annual reports, Juvenile Justice Board statistics, and published research on juvenile rehabilitation in India. Case study analysis focused on documented interventions in Delhi and Tamil Nadu, selected for their innovative approaches and availability of outcome data. This selection strategy provides depth of analysis but may limit generalizability to other contexts.

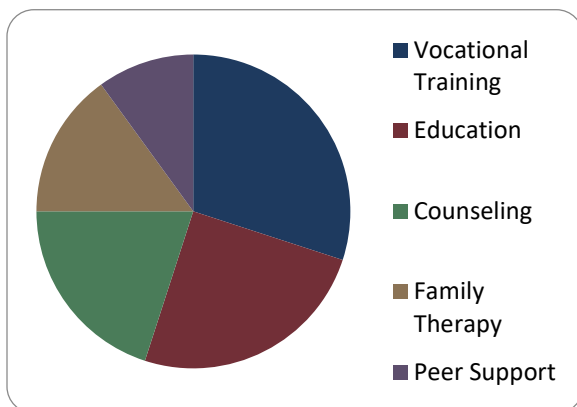
FINDINGS

Key Innovations in Rehabilitation Social Work

Analysis of secondary data revealed several innovative approaches in rehabilitation social work practice. Peer-led interventions

emerged as a particularly effective strategy, with trained peer mentors providing support, modelling prosocial behaviour, and facilitating group activities. The Community-Based Peer-Led Intervention (CPLI) module, developed by the Society for Promotion of Youth and Masses (SPYM) in Delhi, has been adopted and scaled by the Government of India (Dianova International, 2025).

Individual Care Plans (ICPs) mandated under Section 39 of the Juvenile Justice Act, 2015, represent another significant innovation. ICPs require individualized assessment of each juvenile's needs, strengths, and circumstances, followed by tailored intervention planning (Government of India, 2016). Social workers reported that ICPs facilitate more targeted interventions and improved outcomes compared to standardized program approaches.



Distribution of rehabilitation intervention types in studied programs

Case Study: Delhi Model of Integrated Juvenile Services

Delhi's juvenile institutions offer a systematic and integrated model combining formal and informal education, vocational training, mental health services, and post-release tracking. According to Ministry of Women and Child Development (2019) data, this model has sustained a 40% lower recidivism rate than national averages. Key success factors include continuing political will, adequate funding, and cross-sectoral collaboration among government agencies, non-governmental organizations, and community stakeholders.

The Juvenile Drug De-Addiction and Rehabilitation Centre (JDRC) in New Delhi exemplifies specialized intervention for substance-using juveniles. Established in 2010, JDRC operates on therapeutic jurisprudence principles, treating each child as capable of healing and transformation (Dianova International, 2025). The center's 90-day holistic program combines detoxification, counseling, literacy, vocational training, and expressive therapies.

Since inception, JDRC has treated over 4,000 juveniles, with many successfully reintegrating into schools, vocational programs, or employment.

Case Study: Tamil Nadu Reintegration-Centred Model

Tamil Nadu has developed a distinctive approach emphasizing post-release support and community reintegration. In partnership with the Juvenile Justice Board, local non-profits, and trained volunteers, Tamil Nadu provides tailored job placements, life skills training, job readiness programs, and family therapy (Tamil Nadu Juvenile Justice Board, 2020). This systemic shift to reintegrating youth has produced positive outcomes, including improved employment rates and lower re-offending rates.

Restorative Justice Outcomes

The Balasangam Project in Kerala demonstrates restorative justice principles in practice. Working with youth involved in theft offenses, the project facilitated restorative conferences where offenders met victims, heard their stories, and developed restitution plans. Three-year follow-up data indicate that participants not only remained offense-free but became peer mentors for

other at-risk youth (Vinolia, 2024). A longitudinal study tracking 400 juveniles across Delhi, Mumbai, and Bengaluru found that participants in restorative programs had 34% lower re-offense rates compared to similar youth in traditional punitive programs.

Social Worker Perspectives

Primary data from social workers emphasizes the importance of vocational training and community reintegration for rehabilitation success. Participants consistently identified family engagement as a critical factor, noting that sustainable change requires supportive home environments. Challenges identified include inadequate resources, high caseloads, insufficient training opportunities, and limited community awareness about juvenile rehabilitation.

Social workers also highlighted the importance of addressing underlying trauma and mental health issues. Many juveniles in conflict with the law have experienced abuse, neglect, or exposure to violence, requiring specialized psychological support. The integration of mental health services into rehabilitation programs was identified as a priority area for program development.

CONCLUSION

Rehabilitation social work plays a vital role in addressing youth in conflict with law and crisis situations in India. This study has demonstrated that innovative approaches grounded in restorative justice and positive youth development principles can achieve significant reductions in recidivism while promoting positive youth development. Case studies from Delhi and Tamil Nadu provide models for effective rehabilitation practice that can inform program development across India.

The Juvenile Justice Act, 2015, provides a supportive legislative framework for rehabilitation-focused interventions, but implementation remains uneven. Scaling successful models requires addressing resource constraints, building professional capacity, and fostering community support for rehabilitation efforts. Social workers, as key implementers of rehabilitation programs, require ongoing training, supervision, and support to effectively fulfil their roles.

Future research should examine long-term outcomes of rehabilitation programs, cost-effectiveness of different intervention models, and strategies for addressing

implementation barriers. Investment in rehabilitation social work represents not only a humane response to youth in conflict with the law but also a sound strategy for promoting public safety and social cohesion. By empowering young people to overcome past mistakes and develop their potential, rehabilitation social work contributes to inclusive nation-building and sustainable development.

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4. Informed Consent:

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5. Data Availability Statement:

The data that support the findings of this study are available upon reasonable request from the corresponding author.

6. Author Contributions (Credit Statement):

□ Author 1: Conceptualisation, Methodology, Writing – Original Draft

□ Author 2&3: Data Curation, Formal Analysis, Writing – Review & Editing

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