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Predictive Role of Internet Addiction and Perceived Social Support on Mental Health Among Undergraduate Students with Demographic Variations

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Abstract

Background: Internet addiction represents a growing mental health concern among undergraduate students, with significant implications for psychological well-being. The protective role of perceived social support in moderating these effects remains unclear. **Objective:** To examine the predictive role of Internet addiction and perceived social support on mental health outcomes among undergraduate students, with analysis of demographic differences. **Methods:** A descriptive cross-sectional study was conducted among 608 final-year undergraduate students from twelve government colleges in Hassan district, Karnataka, India. Data were collected using validated instruments including the Internet Addiction Test (IAT), Depression Anxiety Stress Scale-21 (DASS-21), Warwick-Edinburgh Mental Well-being Scale (WEMWBS), and Social Provisions Scale (SPS). Multiple regression analyses examined predictive relationships. **Results:** Internet addiction significantly predicted increased depression (β=0.478, $p<.001$), anxiety (β=0.426, $p<.001$), and stress (β=0.382, $p<.001$), while negatively predicting well-being (β=-0.182, $p<.001$). Students using smartphones for 6+ hours daily demonstrated significantly higher psychological distress. Part-time working students and Arts stream students showed elevated mental health risks. Contrary to expectations, perceived social support showed no significant predictive relationships. **Conclusions:** Internet addiction emerges as a significant predictor of adverse mental health outcomes, with smartphone usage exceeding 6 hours daily representing a critical threshold. These findings necessitate targeted interventions addressing excessive Internet use and comprehensive support systems recognizing demographic vulnerabilities.

Keywords: Internet addiction, mental health, social support, undergraduate students, smartphone usage

1. Introduction

Internet addiction is defined as a behavioral condition characterized by an uncontrollable desire to engage in online activities that significantly compromises personal, academic, or social functioning. This condition involves compulsive usage that interferes with daily life and responsibilities (Chen et al., 2023; Nwufo & Ike, 2024). It represents a global mental health concern, particularly among adolescents and young adults, demonstrating a bidirectional relationship with various psychological conditions.

Mental health outcomes encompass overall psychological well-being and an individual's capacity to manage stress, work productively, and contribute to their community. These outcomes include key components such as depression, anxiety, and stress disorders that significantly impact mental stability and optimism (Wilson & Somhlaba, 2016). A longitudinal study in Japan confirmed that poor mental health can promote Internet addiction onset and vice versa (Otsuka et al., 2020). Similarly, research among Malaysian adolescents revealed strong correlations between Internet addiction prevalence and emotional distress (Fu et al., 2022).

Conversely, perceived social support is defined as an individual's subjective evaluation of how supported they feel by significant others such as family, friends, and companions. This serves as a critical predictor of mental and physical health outcomes (Proescher et al., 2020). Social support functions as a protective factor, with Chinese college freshmen showing negative associations between higher social support levels and Internet addiction risk (Lu et al., 2023). Demographic variations significantly influence these relationships, as evidenced by Iranian high school students where substantial percentages faced Internet addiction risks associated with anxiety and depression (Tarrahi et al., 2022).

Additionally, personality traits mediate these connections, with emotional stability functioning as a key mediating factor between Internet addiction and emotional distress in Malaysian populations. This indicates that emotional health interventions may effectively reduce addiction and its adverse effects (Fu et al., 2022).

Research into the predictive role of Internet addiction and perceived social support on mental health outcomes among undergraduate students is crucial given the growing prevalence of Internet addiction as a significant global mental health concern (Lu et al., 2023). Internet addiction contributes to serious psychological issues including anxiety, depression, and loneliness (Bottaro et al., 2024; Oliveira et al., 2024). Social support demonstrates a buffering role against stress and mental health issues through emotional and practical assistance (Haugstvedt, 2022).

The interaction between these variables suggests that social support could potentially moderate the adverse effects of Internet addiction on mental health outcomes (Lu et al., 2023). Gender and cultural factors significantly shape these experiences, with males reportedly exhibiting higher Internet addiction levels and cultural backgrounds influencing social support dynamics (Bottaro et al., 2024). Furthermore, as adolescents and young adults actively seek mental health information online, understanding how these activities intermingle with their mental health journeys becomes essential for tailoring health consultations (Scott et al., 2021). Secure frameworks for accessing social media data offer potential for nuanced insights into online behavior's impact on youth mental health (Leightley et al., 2023).

These findings underscore the substantial impact of Internet addiction on mental health outcomes and the critical protective role of perceived social support across various cultural contexts (Zell & Stockus, 2025). This emphasizes the need for research that deepens understanding of how these factors predict mental health outcomes to provide a foundation for targeted interventions, policies, and support systems tailored to undergraduate populations.

2. Methodology

2.1 Study Aim: To examine the predictive role of Internet addiction and perceived social support on mental health outcomes among undergraduate students, with analysis of demographic differences.

2.2 Objectives

1. To assess socio-demographic profiles of undergraduate students in Hassan district government colleges
2. To evaluate predictive roles of Internet addiction and perceived social support on mental health outcomes
3. To analyze demographic differences in Internet addiction and mental health outcomes across various socio-demographic variables

2.3 Study Design: Descriptive cross-sectional design examining Internet addiction, perceived social support, and mental health outcomes among final-year undergraduate students.

2.4 Population and Setting

The study population comprised 3,040 final-year students enrolled in Arts, Commerce, and Science programs during the 2023-2024 academic year across twelve Government First Grade Colleges in Hassan district zones C, D, and E.

2.5 Sampling

Stratified simple random sampling was employed, yielding 608 students representing 20% of the total population. The sample maintained proportional representation across educational streams, gender, and geographical zones.

2.6 Data Collection

Data were collected using bilingual structured questionnaires available in both English and Kannada languages. Questionnaires were administered via secure Google Forms to ensure data integrity and participant convenience.

2.7 Instruments

The following validated instruments were utilized with appropriate developer permissions:

- ***Personal Data Sheet:*** Comprehensive socio-demographic information collection
- ***Internet Addiction Test (IAT):*** Assessment of Internet addiction levels
- ***Depression Anxiety Stress Scale-21 (DASS-21):*** Measurement of psychological distress
- ***Warwick-Edinburgh Mental Well-being Scale (WEMWBS):*** Evaluation of mental well-being
- ***Social Provisions Scale (SPS):*** Assessment of perceived social support

2.8 Data Analysis

Data analysis was conducted using Microsoft Excel and SPSS software. Descriptive statistics provided sample characterization, while inferential analyses including correlation and multiple regression examined predictive relationships across demographic subgroups.

2.9 Ethical Considerations

The study obtained institutional permissions, informed consent from all participants, and ethical clearance from the University of Mysore Institutional Human Ethics Committee (IHEC).

2.10 Study Limitations

Several limitations must be acknowledged: geographic restriction to Hassan district limits generalizability, inclusion of only three academic streams.

3. Results

3.1 Socio-Demographic Profile of Undergraduate Students

Table 1: Socio-Demographic Profile of Respondents (N=608)

Variable	Category	N	%
Gender	Male	352	57.89
	Female	256	42.11
Age	20-21 Years	521	85.69
	Other Ages	87	14.31
Educational Stream	Commerce	245	40.3
	Arts	183	30.1
	Science	180	29.6
Residential Area	Rural	529	87.01
	Urban	79	12.99
Annual Family Income	Up to ₹1 Lakh	579	95.23
	Above ₹1 Lakh	29	4.77
Parental Literacy	Both Parents Illiterate	262	43.09
	Other Combinations	346	56.91

The study comprised 608 undergraduate students from Hassan district government colleges. Gender distribution revealed male predominance with 352 students (57.89%) compared to 256 females (42.11%). The majority were aged 20-21 years (521 students, 85.69%), predominantly Hindu (591 students, 97.20%), and belonged to Other Backward Classes (344 students, 56.58%).

Most students were unmarried (565 students, 92.93%) and lived in nuclear families (415 students, 68.26%). A substantial majority came from rural backgrounds (529 students, 87.01%). Economic indicators revealed that 579 students (95.23%) reported annual family income below ₹1 lakh. Parental literacy challenges were evident, with 262 students (43.09%) having both parents illiterate. Agriculture emerged as the primary parental occupation (430 students, 70.72%).

3.2 Demographic Differences in Internet Addiction and Mental Health Outcomes

3.2.1 Part-Time Work Engagement Differences

Table 2: Part-Time Work Engagement Differences (df = 606)

Variable	Part-Time Work	M	SD	t	p
Internet Addiction	Yes	32.60	18.31	3.898	<.001**
	No	26.28	16.57		
Depression	Yes	12.51	7.96	2.925	.004*
	No	10.47	7.13		
Anxiety	Yes	11.24	7.27	2.038	.042*
	No	9.88	6.91		

Stress	Yes	16.36	7.81	2.663	.008*
	No	14.43	7.55		

*Note: *p < .05, *p < .001*

Independent samples t-tests revealed significant differences between part-time working students (n=144) and non-working students (n=464). Part-time working students demonstrated significantly higher levels across multiple psychological variables. No significant differences emerged for well-being and perceived social support (p>.05).

3.2.2 Educational Stream Differences

Table 3: Educational Stream Differences (df = 2, 605)

Variable	Arts M(SD)	Science M(SD)	Commerce M(SD)	F	p
Depression	12.47 (7.71)	10.28 (7.58)	10.31 (6.85)	5.622	.004*
Anxiety	12.22 (7.35)	9.08 (6.92)	9.51 (6.53)	11.435	<.001**
Stress	16.46 (7.38)	13.93 (7.76)	14.41 (7.62)	5.83	.003*
Reliable Alliance	11.66 (1.80)	11.10 (2.00)	11.28 (1.90)	4.175	.016*

*Note: *p < .05, *p < .001*

One-way ANOVA analyses across Arts (n=183), Science (n=180), and Commerce (n=245) students revealed significant differences in multiple psychological variables. Arts students consistently exhibited higher psychological distress while simultaneously showing higher reliable alliance scores, indicating stronger perceived social support.

3.2.3 Daily Smartphone Usage Effects

Table 4: Daily Smartphone Usage Differences (df = 3, 604)

Variable	0-1hr M(SD)	2-3hrs M(SD)	4-5hrs M(SD)	6+hrs M(SD)	F	p
Internet Addiction	27.25 (17.74)	25.28 (16.19)	28.92 (18.14)	35.60 (15.31)	6.766	<.001**
Depression	9.97 (7.57)	10.89 (7.04)	10.31 (7.26)	14.38 (8.20)	5.587	.001*
Anxiety	9.65 (7.27)	10.08 (7.01)	9.53 (6.22)	13.46 (8.28)	5.437	.001*
Stress	14.05 (7.86)	14.79 (7.66)	14.13 (7.10)	18.67 (8.10)	6.237	<.001**

*Note: *p < .05, *p < .001; Post-hoc analyses showed 6+ hours group significantly higher than all other groups*

Daily smartphone usage analysis revealed a critical threshold effect at 6+ hours daily usage (n=63). These students demonstrated significantly higher scores across all psychological distress measures compared to all other usage groups (all p<.05).

Additional analyses revealed that students from single-parent households showed significantly higher anxiety (M=12.31 vs 9.81, p=.007) and stress levels (M=16.66 vs 14.51, p=.033) compared to students with both parents alive. Complex patterns emerged where students with only mother literate or only mother employed showed higher psychological distress compared to other parental configurations.

3.3 Predictive Relationships Between Internet Addiction and Mental Health Outcomes

Table 5: Regression Analysis Summary (df = 2, 605)

Outcome Variable	R^2	F	p	Internet Addiction β	p	Social Support β	p
Depression	.231	90.805	<.001**	0.478	<.001**	0.031	.387
Anxiety	.184	68.112	<.001**	0.426	<.001**	0.030	.411
Stress	.146	51.622	<.001**	0.382	<.001**	-0.001	.973
Well-being	.033	10.481	<.001**	-0.182	<.001**	0.023	.561

*Note: *p < .001; β = standardized regression coefficient*

Multiple regression analyses examined the predictive role of Internet addiction and perceived social support on mental health outcomes. Internet addiction consistently emerged as a significant predictor across all mental health variables, while perceived social support failed to demonstrate significant predictive relationships.

The regression models demonstrated that Internet addiction significantly predicted increased depression (explaining 23.1% variance), anxiety (18.4% variance), and stress (14.6% variance), while negatively predicting well-being (3.3% variance). For each standard

deviation increase in Internet addiction scores, depression increased by 0.478 standard deviations, anxiety by 0.426 standard deviations, stress by 0.382 standard deviations, and well-being decreased by 0.182 standard deviations. Contrary to theoretical expectations, perceived social support did not emerge as a significant predictor in any model.

4. Discussion

4.1 Part-Time Work and Mental Health Implications

The current study's finding that part-time working students demonstrated significantly higher levels of Internet addiction, depression, anxiety, and stress compared to their non-working counterparts is consistent with research establishing that part-time work experience is significantly associated with mental health problems (Shin et al., 2020). Studies among pre-service teachers revealed that Internet addiction correlated with depression and life satisfaction, with loneliness being a significant factor (Essel et al., 2022). This suggests that part-time work may increase students' vulnerability to Internet addictive behaviors as a maladaptive coping mechanism for managing work-study pressures. The COVID-19 pandemic has further exacerbated these mental health issues among students (Van Ryzin et al., 2022).

4.2 Educational Stream Differences in Mental Health Outcomes

The current study's finding that Arts students demonstrated significantly higher levels of depression, anxiety, and stress compared to Science and Commerce students, while also showing higher reliable alliance scores indicating stronger perceived social support, reflects the complex psychological dynamics within different academic disciplines. These patterns suggest that Arts students may engage more deeply with emotionally challenging content, which could impact their mental health, while the strong social networks often observed in Arts settings provide a protective buffer (Powers et al., 2015). These findings underscore the importance of educational institutions implementing tailored approaches that acknowledge the distinctive demands and stressors of each educational stream to enhance mental health support effectiveness across diverse academic disciplines (Yang et al., 2022; Garaigordobil, 2023).

4.3 Critical Smartphone Usage Threshold

The current study's finding that students using smartphones for 6+ hours daily demonstrated significantly higher scores on Internet addiction, depression, anxiety, and stress compared to all other usage groups establishes a critical usage threshold with profound mental health implications. This finding aligns with research among nursing students showing significant relationships between smartphone addiction and depression and anxiety symptoms (Meneses & Andrade, 2024). Studies of young adults demonstrate high positive correlations between smartphone usage time and addiction levels affecting social anxiety and mental health (Korkmazer et al., 2022). Research further confirms that problematic smartphone use relates to mental health symptoms like anxiety and depression, with psychological distress mediating the relationship between Internet addiction and school engagement (Ren et al., 2023; Öztekin, 2024).

4.4 Predictive Role of Internet Addiction

The current study's findings that Internet addiction significantly predicted increased depression (β=0.478, $p<.001$), anxiety (β=0.426, $p<.001$), and stress (β=0.382, $p<.001$), while negatively predicting well-being (β=-0.182, $p<.001$), are consistent with research demonstrating Internet addiction's quantifiable detrimental effects on mental health. Studies show similar variance explanations of 23.1% for depression, 18.4% for anxiety, and 14.6% for stress (Fu et al., 2022; Demenech et al., 2023). The unexpected finding that perceived social support failed to demonstrate significant predictive relationships contrasts with research on Chinese college freshmen showing social support had significant negative predictive effects on Internet addiction, particularly when moderated by gender (Lu et al., 2023). This suggests that social support's role may vary depending on context and individual differences in perceiving and utilizing support (Kim et al., 2023).

4.5 Intervention Strategies and Recommendations

To address these challenges, comprehensive intervention strategies are essential. These include time management workshops, financial planning services, accessible mental health support, awareness programs about Internet addiction, systematic screening for early intervention, and promotion of healthy alternatives such as physical activities (Jeftic et al., 2023).

Specific interventions should focus on awareness programs for early identification of shame and experiential avoidance factors in Internet addiction (Teymouri Farkush et al., 2022), personalized interventions addressing emotion regulation difficulties (Oliveira et al., 2024), teaching problem-solving skills and proactive coping mechanisms (Hasan & Abu Jaber, 2019), encouraging social engagement and peer education programs (Özarıcı & Cangöl Sögüt, 2021), and promoting regular physical activity to mediate depression symptoms (Demenech et al., 2023).

Additional strategies include addressing negative emotions and fatigue (Gu et al., 2024), engaging instructors in compassionate dialogue for mental health support (Diplacito-Derango, 2021), integration of wellness education into academic curricula (Johnson et al., 2019), implementation of mindfulness practices to reduce mobile phone attachment (Hefner & Freytag, 2023), encouragement of regular physical activity to decrease phone addiction and negative emotions (Tong & Meng, 2023), and grayscale screen interventions to reduce daily screen time (Dekker & Baumgartner, 2023).

Technology-based interventions include utilization of mobile mental health applications and stress management tools (Palmer & Henderson, 2019; Son et al., 2023), and time management applications like MindsCare for personalized interventions (Lee et al., 2022). Educational interventions should target individuals, families, and communities to foster supportive environments encouraging healthy Internet habits (Öztekin, 2024).

Broader prevention strategies encompass regular physical exercise to break sedentary lifestyles and reduce depressive symptoms (Demenech et al., 2023), emotional interventions and workplace environment adjustments to manage anxiety and reduce addiction risks (Tan et al., 2025), enhancing family connectivity through health education to strengthen familial ties and support adolescents (Ariani et al., 2018), and early prevention programs targeting at-risk populations through structured educational programs and proactive engagement (Tarrahi et al., 2022).

4.6 Practical Intervention Strategies for Karnataka College System

Karnataka colleges should implement culturally adapted interventions including structured time management workshops incorporating traditional Indian concepts of time discipline (samaya niyama) alongside modern digital wellness practices, financial literacy programs addressing education loan stress, and peer education programs conducted in local languages (Kannada, Telugu, Tamil) utilizing Karnataka's strong community traditions for early identification of internet addiction and mental health concerns. Campus-based support groups should integrate traditional practices like yoga, meditation, and Ayurvedic stress management with evidence-based interventions, while mobile applications with Kannada language support for stress management, grayscale screen interventions during festival periods, and promotion of traditional physical activities like kabaddi and classical dance provide healthy alternatives to excessive screen time. Social work interventions must encompass case work approaches for individualized academic and financial counseling using strengths-based assessment, group work facilitation for therapeutic support circles, community organization to mobilize campus resources and student networks, family systems intervention to strengthen intergenerational communication, crisis intervention models for immediate support, and social action advocacy for institutional policy changes. Educational modifications should integrate digital wellness into existing curricula, train faculty to recognize mental health issues, establish phone-free zones in hostels and campus areas, create partnerships with local NGOs and healthcare providers considering socioeconomic diversity, and utilize ecological systems approaches addressing individual, family, campus, and community factors that influence student digital behavior and mental health outcomes across Karnataka's rural and urban populations.

5. Conclusion

This study establishes Internet addiction as a significant predictor of adverse mental health outcomes among undergraduate students, explaining substantial variance in depression (23.1%), anxiety (18.4%), and stress (14.6%). Key risk factors identified include part-time work engagement, Arts stream enrollment, and smartphone usage exceeding 6 hours daily, which provides a practical screening criterion for mental health professionals.

Contrary to theoretical expectations, perceived social support showed no significant predictive relationships, challenging conventional assumptions about its protective role in this population. These findings necessitate targeted interventions addressing excessive Internet use and comprehensive support systems that recognize demographic vulnerabilities.

The identification of the 6+ hour daily smartphone usage threshold represents a significant practical contribution, offering mental health professionals and educators a concrete screening tool for identifying at-risk students. Educational institutions should implement stream-specific support programs, with particular attention to Arts students and those engaged in part-time work.

Future research directions should include longitudinal studies to establish temporal relationships between variables, quasi-experimental studies for intervention effectiveness testing, qualitative studies to explore lived experiences of Internet addiction among students, cross-regional comparative studies across different Indian contexts, mixed-methods research examining social support dynamics, and intervention studies validating the 6+ hour threshold for practical mental health screening applications. These research endeavors will enhance understanding of these complex relationships and inform evidence-based intervention strategies for supporting undergraduate student mental health in the digital age.

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