

**Liberal Journal of Language & Literature Review**

**Print ISSN: 3006-5887**

**Online ISSN: 3006-5895**

**<https://llrjournal.com/index.php/11>**

**IMPACT OF SMARTPHONE ADDICTION ON ACADEMIC  
STRESS AND ACADEMIC PERFORMANCE AMONG  
UNIVERSITY STUDENTS: ROLE OF ACADEMIC  
PROCRASTINATION**

**Dr. Haleema Parveen<sup>1</sup>, Dr. Iram Shahzadi<sup>2</sup>, Ishrat Rana<sup>3</sup>,  
Abdul Waheed<sup>\*4</sup>, Dr. Abid Hussain<sup>5</sup>, Asif Ali Jauhar<sup>6</sup>**

*<sup>1</sup>Government Graduate College for Women, Mumtazabad  
Multan, Pakistan*

*<sup>2</sup>Lecturer Department of Education, Lasbela University of  
Agriculture, Water and Marine Sciences (LUAWMS)*

*<sup>3</sup>Ph.D Scholar Department of Psychology Riphah  
International University Faislabad*

*<sup>\*4</sup>Life Institute of Counseling and Research Training*

*<sup>5</sup>National Professional Officer Health Department Multan,  
Pakistan*

*<sup>6</sup>Ph.D Scholar Department of Psychology Riphah  
International University Faislabad*

*<sup>1</sup>haleemapk5@gmail.com,*

*<sup>2</sup>iramkarim207@gmail.com,*

*<sup>3</sup>ishratrana786@gmail.com,*

*<sup>\*4</sup>abdulwaheed.liert@gmail.com,*

*<sup>5</sup>drabidwho@gmail.com,*

*<sup>6</sup>asifalijohar786786@gmail.com*



### Abstract

*The present study examined the impact of smartphone addiction on academic stress and academic performance among university students, with academic procrastination examined as a mediating variable. A quantitative correlational research design was employed using a convenience sampling technique. The sample comprised 189 university students enrolled in undergraduate and postgraduate programs. Data were collected using the Smartphone Addiction Scale–Short Version (SAS-SV), Procrastination Assessment Scale–Students (PASS), Perception of Academic Stress Scale (PAS), and self-reported CGPA/GPA as an indicator of academic performance. Data were analyzed using descriptive statistics, Pearson product-moment correlations, regression analyses, and mediation analysis through SPSS. Results indicated that smartphone addiction was significantly positively associated with academic stress ( $r = .48, p < .01$ ) and academic procrastination ( $r = .45, p < .01$ ), while it was significantly negatively associated with academic performance ( $r = -.32, p < .01$ ). Smartphone addiction significantly predicted academic stress and academic performance. Mediation analyses further showed that academic procrastination significantly mediated the relationship between smartphone addiction and academic stress, as well as between smartphone addiction and academic performance. These findings suggest that excessive smartphone use may contribute to academic difficulties partly through increased procrastination. The study highlights the importance of promoting responsible smartphone use and reducing academic procrastination among university students.*

**Keywords:** *Smartphone addiction, academic stress, academic performance, academic procrastination, university students*

### Introduction

The rapid development of digital technology has fundamentally transformed the way university students communicate, learn, socialize, and manage their everyday lives. Among the most influential technological developments is the smartphone, which has evolved from a communication device into an essential multifunctional tool for education, entertainment, social interaction, information seeking, online shopping, financial transactions, and personal organization. Smartphones provide university students with immediate access to electronic books, learning management systems, online lectures, educational applications, digital libraries, and communication with teachers and classmates (Paterna et al., 2024). Consequently, smartphones can make higher education more flexible, accessible, and interactive. However, the same characteristics that make smartphones useful can also encourage excessive and uncontrolled use. When smartphone use becomes difficult to regulate and begins to interfere with academic, psychological, social, or daily functioning, it may be conceptualized as problematic smartphone use or smartphone addiction. Recent research has increasingly identified problematic smartphone use as an important issue among university students because of its potential relationship with psychological distress, academic difficulties, procrastination, and reduced academic achievement (Mohd Amin et al., 2024).

University students constitute an especially important population for examining smartphone addiction because this stage of life involves increasing independence, substantial academic demands, social pressures, and relatively high levels of digital engagement. Unlike younger students, university students frequently have unrestricted access to smartphones and may use them without direct parental supervision. Smartphones can therefore become integrated into almost every part of students' academic and personal routines. A systematic review of problematic smartphone use among university students reported that the prevalence of problematic smartphone use across reviewed studies ranged from 36.5% to 67%, with an average prevalence of approximately 52%. The review also identified associations between problematic smartphone use and

psychological problems, sleep difficulties, and poorer academic functioning (Sohn et al., 2023). These findings indicate that smartphone use among university students is not simply a question of how many hours students spend on their phones; rather, the degree to which smartphone use becomes compulsive, uncontrollable, and disruptive to important activities is particularly relevant. The distinction between ordinary smartphone use and smartphone addiction is important in the context of academic research. Smartphones are not inherently harmful, and moderate use for academic purposes can potentially enhance students' learning experiences. Students can use smartphones to access course materials, participate in online discussions, conduct research, communicate with instructors, and complete assignments. Therefore, the concern is not smartphone ownership or use itself but excessive, uncontrolled, or dysfunctional use. Problematic smartphone use may involve symptoms such as persistent preoccupation with the device, inability to reduce usage, withdrawal-like experiences when access is restricted, excessive checking, use despite negative consequences, and interference with academic or social responsibilities. A recent systematic review of longitudinal studies found that academic stress, mental-health difficulties, social rejection, family-related factors, and other psychosocial conditions can contribute to the development of smartphone addiction, suggesting that the relationship may be complex and potentially bidirectional rather than simply a one-way effect (Crowhurst et al., 2024).

### **Smartphone Addiction and Academic Stress**

One of the major concerns associated with smartphone addiction among university students is academic stress. Academic stress refers to the psychological and emotional strain experienced by students when they perceive academic demands, responsibilities, examinations, assignments, competition, or performance expectations as exceeding their available resources. University students commonly face multiple academic pressures, including heavy workloads, deadlines, examinations, presentations, assignments, competition for grades, expectations from parents and teachers, uncertainty about future careers, and concerns about employment. When these demands accumulate, students may experience academic stress, which can interfere with concentration, motivation, emotional well-being, sleep, and academic functioning.

The relationship between smartphone addiction and academic stress can be understood through several mechanisms. First, excessive smartphone use consumes time that could otherwise be devoted to studying, completing assignments, sleeping, or engaging in restorative activities. A student who repeatedly checks social media notifications, watches short-form videos, communicates through messaging applications, or plays games during study periods may experience frequent interruptions in attention. Such interruptions can reduce the quality of study time and cause academic tasks to remain unfinished. The resulting accumulation of incomplete assignments and preparation may subsequently increase academic stress. Second, smartphone addiction may contribute to sleep disruption. Students who use smartphones late at night may delay bedtime, experience prolonged screen exposure, or continue engaging with highly stimulating digital content instead of sleeping. Reduced or irregular sleep can negatively influence concentration, memory, emotional regulation, and energy levels. When students subsequently experience difficulty concentrating or completing academic work, they may perceive their academic demands as more stressful. Thus, excessive smartphone use may contribute indirectly to academic stress through disrupted sleep and reduced academic self-regulation. Third, smartphone use may function as an immediate source of distraction or emotional escape. When students experience difficult academic tasks, anxiety, boredom, or frustration, they may turn to their smartphones for temporary relief. Social media, entertainment, gaming, and messaging provide immediate rewards that are often more attractive than demanding academic activities. Although this behavior may temporarily reduce unpleasant feelings, it can postpone academic responsibilities and increase the workload that students must face later. Consequently, smartphone use may become part of a cycle in which academic stress encourages smartphone use, while excessive smartphone use contributes to additional academic problems and stress. Recent evidence supports the association between smartphone-related behaviors and stress. A review of 32 studies concerning university students concluded that excessive smartphone use was associated with adverse psychosocial outcomes, including increased stress, anxiety, and depression, as well as negative academic consequences (Mohd Amin et al., 2024). Similarly, longitudinal evidence synthesized by Crowhurst et al. (2024) identified academic stress as one of the factors associated with smartphone addiction. This finding is particularly important because it indicates that smartphone addiction and academic stress may reinforce each other. Students experiencing academic stress may use

smartphones as a coping mechanism, while excessive smartphone use may subsequently interfere with academic functioning and contribute to additional stress. Evidence from Pakistan provides further support for this relationship. Bhutto et al. (2024), in a study of university students in Sindh, Pakistan, reported a significant positive relationship between smartphone addiction and academic stress. The study involved 108 university students and found that greater smartphone addiction was associated with greater academic stress. These findings suggest that the relationship observed internationally may also be relevant within the Pakistani higher-education context. Similarly, Iqbal et al. (2023) reported a significant relationship among smartphone addiction, interpersonal relationships, and academic stress at the university level in Pakistan. Such evidence indicates that smartphone addiction may affect students not only directly but also through changes in interpersonal and academic experiences.

### **Smartphone Addiction and Academic Performance**

Academic performance represents another important outcome associated with students' smartphone use. Academic performance generally refers to students' achievement in educational activities and may be measured through grade point average, examination results, course grades, assignment performance, or other indicators of educational achievement. University students are expected to engage in sustained attention, independent learning, time management, self-regulation, critical thinking, and consistent preparation. Excessive smartphone use may interfere with several of these processes. One of the strongest explanations for the negative relationship between smartphone addiction and academic performance is distraction. Smartphones provide continuous access to notifications, social networking sites, video platforms, games, messaging services, and other attention-demanding applications. Even when students initially intend to use their phones for academic purposes, the presence of non-academic applications can create opportunities for distraction. Frequent switching between academic tasks and smartphone content can fragment attention and reduce the depth of learning. Consequently, students may spend considerable amounts of time studying without achieving equivalent academic productivity.

Recent meta-analytic evidence provides support for this argument. Paterna et al. (2024) synthesized 29 studies involving 48,490 participants and found a small negative relationship between problematic smartphone use and academic achievement ( $r = -.110$ ). Although the effect was relatively small, the large number of participants and studies provides evidence that problematic smartphone use can be considered one potential contributor to reduced academic achievement. Importantly, the findings also demonstrate that smartphone addiction should not be viewed as the sole determinant of academic success. Academic performance is influenced by numerous factors, including intelligence, motivation, self-efficacy, socioeconomic circumstances, teaching quality, family support, study habits, mental health, and time management. More recent evidence has further strengthened the argument. Hsieh (2025), in a meta-analysis of 45 studies involving 84,268 university students from 18 countries, found a small but statistically significant negative association between smartphone-use frequency and academic performance ( $r = -.12$ ). The negative association was more pronounced when studies examined smartphone addiction or problematic smartphone use rather than general smartphone use. The analysis also suggested that multitasking with smartphones during classes had particularly negative academic consequences. These findings are important because they reinforce the argument that problematic or uncontrolled use may be more academically damaging than purposeful educational use.

Similarly, a broader meta-analysis of technology-related factors involving 124,166 students from 28 countries found a small but statistically significant negative association between technology-related behaviors—including smartphone use, social media use, and video gaming—and academic performance ( $d = -.085$ ) (Frontiers, 2025). Although the overall effect was modest, the consistency of the association across a large international sample suggests that digital behavior is relevant to understanding academic outcomes. The Pakistani context also provides evidence of an association between smartphones and academic outcomes. Khan et al. (2020) examined smartphone use and academic performance among university students in Pakistan and considered smartphone applications, messaging, entertainment, and other smartphone functions in relation to students' academic performance. More recent Pakistani research has continued to highlight concerns regarding smartphone addiction and academic functioning. Ghafoor et al. (2022), for example, investigated smartphone addiction and academic performance among medical students in Pakistan while considering self-regulation and bedtime procrastination. Their findings were particularly informative because

smartphone addiction was associated with bedtime procrastination, while bedtime procrastination was negatively associated with academic performance. Bedtime procrastination also mediated the relationship between smartphone addiction and academic performance. These results suggest that the effects of smartphone addiction on academic outcomes may operate through behavioral mechanisms rather than always occurring as a simple direct relationship. Furthermore, a 2026 study of 733 university students at the University of Lahore examined nomophobia, psychological distress, and academic performance. The researchers reported that fear of being without a mobile phone was relevant to students' stress, concentration, psychological well-being, and academic functioning (Nomophobia and Its Association With Academic Performance and Psychological Distress, 2026). Such evidence is particularly valuable for the Pakistani perspective because it demonstrates that smartphone-related behavioral problems remain relevant within contemporary Pakistani universities.

#### **Academic Procrastination as a Mediating Variable**

Academic procrastination is a central concept in the proposed research because it may explain how smartphone addiction contributes to academic stress and academic performance. Academic procrastination refers to the unnecessary and voluntary delay of academic tasks despite recognizing that the delay may produce negative consequences. Students may procrastinate by postponing assignments, delaying examination preparation, avoiding difficult coursework, or spending time on non-academic activities when they should be studying. Smartphones provide a particularly convenient environment for procrastination. Unlike traditional distractions, smartphones are portable, constantly available, personalized, and capable of providing immediate entertainment and social rewards. A student who intends to study may receive a notification, open a social networking application, watch a short video, respond to a message, or browse online content. What begins as a brief interruption can become an extended period of non-academic activity. Therefore, smartphone addiction may increase the likelihood that students postpone academic tasks. Recent meta-analytic evidence provides strong support for this proposed mechanism. Zhou et al. (2024) conducted a meta-analysis examining the relationship between mobile phone addiction and procrastination among students and found a moderate positive correlation. Importantly, the strength of this association was influenced by education level, sex, culture, and the measurement tools used. These findings suggest that the relationship between smartphone addiction and procrastination is sufficiently consistent across studies to warrant further examination while also highlighting the importance of contextual factors.

Another systematic review and meta-analysis published in 2024 similarly concluded that smartphone addiction and procrastination are positively related among students (Zhou et al., 2024). The evidence suggests that smartphone addiction may increase students' tendency to postpone tasks because smartphones provide immediate alternative rewards. From a behavioral perspective, academic tasks frequently require delayed gratification: students must invest effort now to receive grades or academic benefits later. Smartphone activities, in contrast, can provide immediate pleasure, social feedback, novelty, and entertainment. Students who have difficulty regulating these immediate rewards may therefore be more likely to postpone academic responsibilities. Recent empirical research has further developed this explanation. Zhao et al. (2025) examined smartphone addiction and academic procrastination among college students using a serial mediation model involving self-control and academic self-efficacy. Their findings indicated that smartphone addiction was indirectly associated with academic procrastination through reduced self-control and academic self-efficacy. This suggests that smartphone addiction may undermine psychological resources that students require to regulate their behavior and remain committed to academic goals. A diary-based study published in 2025 also found a positive relationship between smartphone addiction and academic procrastination among college students (Su et al., 2025). The study used repeated daily assessments rather than relying solely on a single cross-sectional measurement, providing evidence that changes in smartphone addiction and related psychological experiences can be linked to changes in procrastination. Although the direction of relationships requires further longitudinal investigation, this evidence strengthens the argument that smartphone addiction and procrastination are closely interconnected.

Academic procrastination can also provide a plausible explanation for the relationship between smartphone addiction and academic stress. When students repeatedly postpone assignments or examination preparation, academic tasks accumulate. As deadlines approach, students may experience greater pressure, anxiety, guilt, and perceived lack of control. Thus, procrastination may transform the initial distraction

associated with smartphone use into a later academic stressor. The student may experience a sequence such as smartphone overuse → postponement of academic work → accumulation of academic tasks → increased academic stress → further smartphone use as an avoidance strategy. This creates a potentially self-reinforcing cycle. The same mechanism can negatively affect academic performance. When academic tasks are delayed until close to deadlines, students may have insufficient time for thorough preparation, revision, reflection, and correction. They may submit incomplete work, prepare inadequately for examinations, or experience reduced quality of learning. Consequently, academic procrastination can serve as a behavioral pathway through which smartphone addiction contributes to poorer academic outcomes.

### **Global Perspective**

Globally, the increasing dependence on smartphones has created a complex relationship between technology and university education. Smartphones offer significant educational advantages, but their uncontrolled use may produce unintended academic and psychological consequences. The available literature increasingly suggests that smartphone addiction should be examined as a multidimensional behavioral issue rather than merely as a matter of screen time. The international evidence demonstrates three particularly important patterns. First, problematic smartphone use is prevalent among university students. The systematic review by Sohn et al. (2023) reported substantial levels of problematic smartphone use across university populations. Second, problematic smartphone use is associated with academic achievement. Paterna et al. (2024) found a small negative relationship between problematic smartphone use and academic achievement, while Hsieh (2025) found a comparable negative relationship between smartphone-use frequency and academic performance among university students. Third, smartphone addiction is consistently associated with procrastination. Meta-analytic evidence indicates a moderate positive relationship between mobile phone addiction and procrastination among students (Zhou et al., 2024).

However, the global literature also indicates that the relationship is not necessarily straightforward. Smartphone use can be beneficial when directed toward educational purposes, and not every student who uses a smartphone extensively develops problematic use. Individual differences in self-control, academic self-efficacy, motivation, personality, social environment, and coping strategies can influence outcomes. Moreover, cultural differences can affect smartphone behavior and the meaning of academic achievement. Zhou et al. (2024) specifically identified culture as a moderator of the relationship between mobile phone addiction and procrastination. Therefore, findings from Western, East Asian, or other international settings should not automatically be generalized to Pakistani university students. Another important issue is methodological. Much of the existing research has used cross-sectional designs and self-report questionnaires. Such studies are useful for identifying relationships but cannot definitively establish causality. For example, smartphone addiction may increase academic stress, but students experiencing high academic stress may also increase their smartphone use as a coping or avoidance strategy. Likewise, poor academic performance may encourage students to escape into smartphone activities, meaning that the relationship may be reciprocal. Longitudinal, experimental, diary-based, and objective smartphone-use studies are therefore increasingly necessary.

### **Pakistani Perspective**

The Pakistani context deserves specific attention because smartphone use has become deeply integrated into university students' academic and social lives. Pakistani university students increasingly rely on smartphones for online learning, communication, social networking, information access, entertainment, and academic collaboration. At the same time, they face academic pressures associated with examinations, assignments, competitive educational environments, parental expectations, career uncertainty, and future employment prospects. These circumstances may make smartphone addiction particularly relevant to academic stress and academic performance. Existing Pakistani research provides evidence that smartphone addiction is associated with academic stress. Iqbal et al. (2023) reported a significant relationship between smartphone addiction and academic stress among university students in Pakistan, while Bhutto et al. (2024) similarly found a positive relationship between smartphone addiction and academic stress among students at the University of Sindh. These findings indicate that excessive smartphone use is not merely a technological concern but may have implications for students' academic and psychological experiences.

Pakistani evidence also suggests that behavioral mechanisms such as procrastination may be important. Ghafoor et al. (2022) found that smartphone addiction was related to bedtime procrastination and

that bedtime procrastination was negatively associated with academic performance among medical students. Although bedtime procrastination differs conceptually from academic procrastination, the findings demonstrate how smartphone-related behavior can interfere with students' self-regulation and subsequently influence academic outcomes. More directly, Anwar et al. (2025) investigated problematic smartphone use and academic procrastination among students in Pakistan. The study was motivated by the relatively limited Pakistani literature on the relationship between these constructs and emphasized the need for additional research in the Pakistani context. This emerging evidence is particularly relevant to the proposed study because academic procrastination may represent an important behavioral mechanism linking problematic smartphone use with academic outcomes. Recent Pakistani research also demonstrates that smartphone-related psychological problems remain relevant in contemporary university populations. A 2026 mixed-methods study of 733 students at the University of Lahore examined nomophobia and its relationship with academic performance and psychological distress. The study highlighted concerns regarding stress, concentration, psychological distress, and academic performance among university students experiencing problematic dependence on mobile phones. This provides further evidence that smartphone-related problems continue to warrant investigation in Pakistani higher education. At the same time, Pakistani students may experience contextual factors that differ from students in other countries. Family expectations, collectivist social relationships, parental monitoring, cultural attitudes toward education, socioeconomic differences, internet accessibility, institutional policies, and differences in digital literacy may shape how students use smartphones. For example, smartphones may simultaneously serve as educational tools and sources of entertainment, making it difficult to distinguish productive use from problematic use. Students may use the same device to attend an online lecture, communicate with classmates, browse social media, and watch entertainment videos within a short period. Therefore, the academic consequences of smartphone use may depend not simply on duration but also on purpose, timing, self-regulation, and behavioral patterns.

#### **Research Gap and Rationale for the Present Study**

Although international research has increasingly examined smartphone addiction, academic stress, academic performance, and procrastination, important gaps remain. First, much of the literature examines these variables separately. Studies have investigated smartphone addiction and academic achievement, smartphone addiction and stress, or smartphone addiction and procrastination, but fewer studies integrate all four constructs into one explanatory model. Second, although evidence increasingly indicates that smartphone addiction is associated with procrastination, the mediating role of academic procrastination in explaining the relationship between smartphone addiction, academic stress, and academic performance requires further investigation. A mediation model is theoretically useful because it moves beyond the question of whether smartphone addiction is associated with academic outcomes and asks *how* this association may occur. Third, the Pakistani literature remains comparatively limited when compared with the international literature. Existing Pakistani studies have provided useful evidence regarding smartphone addiction, academic stress, academic performance, and procrastination, but many studies have focused on individual relationships, specific groups such as medical students, or particular institutions. Consequently, additional research involving broader university-student populations is necessary. Fourth, existing evidence suggests that smartphone addiction and academic stress may have a reciprocal relationship. Academic stress may encourage students to use smartphones as an avoidance or coping mechanism, while excessive smartphone use may increase procrastination and academic workload, thereby generating additional stress. Investigating academic procrastination as a mediator may help clarify this potential cycle. The present study therefore proposes that smartphone addiction may influence academic stress and academic performance partly through academic procrastination. Students who experience higher levels of smartphone addiction may be more likely to postpone academic responsibilities. Increased procrastination may lead to accumulated academic tasks, inadequate preparation, deadline pressure, and poorer academic outcomes. At the same time, these consequences may increase students' perceived academic stress. Academic procrastination can therefore be conceptualized as an important behavioral pathway connecting problematic smartphone use with students' academic experiences. The proposed research is significant because it addresses a contemporary educational problem at the intersection of technology, psychology, and higher education. Understanding this relationship can help universities identify students who may be vulnerable to problematic smartphone use and develop interventions emphasizing digital self-regulation, time management, study planning, and healthy technology

habits. Rather than treating smartphones as inherently negative, universities can promote responsible and purposeful use while helping students recognize patterns of compulsive use and academic avoidance. Overall, the existing global and Pakistani evidence suggests that smartphone addiction is an increasingly relevant factor in university students' academic lives. Recent meta-analyses demonstrate negative associations between problematic smartphone use and academic achievement, while systematic reviews and empirical studies indicate relationships between smartphone addiction, psychological distress, stress, and procrastination. Evidence from Pakistan similarly suggests significant relationships between smartphone addiction and academic stress and growing concern regarding procrastination and academic outcomes. Nevertheless, the precise mechanisms through which smartphone addiction affects academic stress and academic performance remain insufficiently understood, particularly within Pakistani university populations. Examining academic procrastination as a mediating variable can therefore provide a more comprehensive understanding of this phenomenon. The proposed study is consequently justified by the need to integrate these variables within a single framework and to generate contextually relevant evidence that can inform students, educators, university administrators, counselors, and policymakers about the academic consequences of problematic smartphone use.

#### **Statement of the Problem**

Smartphones have become an essential part of university students' academic and social lives. Although smartphones provide valuable educational resources, excessive and uncontrolled use may lead to smartphone addiction, which can interfere with students' concentration, time management, and academic responsibilities. Recent studies indicate that problematic smartphone use is associated with increased academic stress, procrastination, and poorer academic performance (Paterna et al., 2024; Zhou et al., 2024). Academic procrastination may be an important mechanism underlying these relationships. Students who frequently use smartphones for social media, entertainment, and other non-academic activities may postpone academic tasks, resulting in accumulated workload, deadline pressure, and increased academic stress. In Pakistan, studies have also reported significant relationships between smartphone addiction and academic stress among university students (Iqbal et al., 2023; Bhutto et al., 2024). However, limited research has examined smartphone addiction, academic stress, academic performance, and academic procrastination together, particularly among Pakistani university students. Therefore, the present study aims to examine the relationship between smartphone addiction and academic stress and academic performance, while investigating whether academic procrastination mediates these relationships among university students.

#### **Significance of the Study**

The present study is significant because it examines the relationship between smartphone addiction, academic stress, and academic performance, while exploring the mediating role of academic procrastination among university students. The findings may help students understand how excessive smartphone use can interfere with their academic responsibilities, increase procrastination, and contribute to academic stress and poor performance. It may encourage students to develop healthier smartphone habits, improve time management, and strengthen their academic self-regulation. The study may also be useful for teachers, university administrators, counselors, and psychologists by providing evidence about the academic and psychological consequences of problematic smartphone use. The findings may help universities develop awareness programs and appropriate interventions to reduce excessive smartphone use and academic procrastination and to improve students' academic well-being. Furthermore, the study may contribute to the existing literature by examining academic procrastination as a mediating factor and by providing evidence from the Pakistani university context. It may also serve as a useful reference for future researchers interested in smartphone addiction, academic stress, procrastination, and academic performance among university students.

#### **Research Methodology**

##### **Research Design**

The present study employed a correlational research design to examine the relationship between smartphone addiction, academic stress, academic procrastination, and academic performance among university students. A quantitative survey approach was used for data collection. The correlational design was considered appropriate because the study examined the relationships among naturally occurring variables without manipulating any variable experimentally. The study investigated whether smartphone addiction was

associated with academic stress and academic performance and examined the role of academic procrastination in these relationships.

#### **Population of the Study**

The population of the study consisted of university students enrolled in undergraduate and postgraduate programs at selected universities. University students were selected as the target population because smartphone use, academic stress, and procrastination were considered relevant factors that could influence students' academic experiences and performance.

#### **Sample and Sampling Technique**

The sample consisted of 189 university students. A convenience sampling technique was used to recruit the participants. This technique was selected because participants who were readily accessible and willing to participate in the study were approached and invited to complete the questionnaire. The participants were selected from university students who met the predetermined inclusion criteria. Efforts were made to include students from different academic programs and levels to obtain variation within the sample.

#### **Research Instruments**

Data were collected through a structured questionnaire consisting of a demographic information section and standardized measures of the study variables. The instruments used in the study were selected because they had been previously developed and used to assess smartphone addiction, academic stress, and academic procrastination among students.

##### **Smartphone Addiction Scale–Short Version (SAS-SV)**

Smartphone addiction was measured using the Smartphone Addiction Scale–Short Version (SAS-SV) developed by Kwon et al. (2013). The SAS-SV was a standardized self-report measure developed to assess problematic smartphone use among adolescents and young adults. The scale consisted of 10 items that assessed different aspects of problematic smartphone use, including daily-life disturbance, withdrawal, cyberspace-oriented relationships, overuse, and tolerance. Participants responded to the items using a Likert-type response format. Higher scores indicated higher levels of smartphone addiction or problematic smartphone use. The SAS-SV had demonstrated satisfactory reliability and validity in previous research and had been widely used in studies involving university students and young adults.

##### **Procrastination Assessment Scale–Students (PASS)**

Academic procrastination was measured using the Procrastination Assessment Scale–Students (PASS) developed by Solomon and Rothblum (1984). The PASS was a standardized instrument specifically designed to assess academic procrastination among students. The instrument assessed students' tendency to delay academic tasks and examined the reasons associated with their procrastination. The scale had been widely used in educational and psychological research to assess academic procrastination among university students. Higher scores represented a greater tendency toward academic procrastination.

##### **Perception of Academic Stress Scale**

Academic stress was measured using the Perception of Academic Stress Scale (PAS) developed by Bedewi and Gabriel (2015). The scale assessed students' perceptions of stress related to academic demands, workload, examinations, academic expectations, and other academic experiences. Higher scores on the scale indicated higher perceived levels of academic stress.

##### **Academic Performance**

Academic performance was assessed through participants' self-reported CGPA/GPA. Participants were asked to report their most recent cumulative or semester grade point average. CGPA/GPA was used as a quantitative indicator of academic performance.

##### **Data Collection Procedure**

Before data collection, the researcher obtained the necessary permission from the relevant authorities. The purpose of the study was explained to the participants before the questionnaires were administered. The participants were informed that their participation was voluntary and that the information provided by them would be kept confidential. Informed consent was obtained from each participant before data collection. The questionnaires were distributed to university students who met the inclusion criteria. Participants first completed the demographic information section and then responded to the standardized measures of smartphone addiction, academic stress, and academic procrastination. They also reported their current CGPA/GPA as an indicator of academic performance. The researcher remained available to provide

clarification regarding the questionnaire instructions but did not influence participants' responses. After completion, the questionnaires were collected and checked for completeness. Incomplete or invalid responses were excluded from the final dataset. A total of 189 valid responses were obtained and included in the final analysis. The collected data were coded and entered into SPSS (Statistical Package for the Social Sciences) for statistical analysis.

#### Ethical Considerations

Ethical principles were followed throughout the research process. Participants were informed about the purpose and nature of the study before providing their consent. Participation was voluntary, and participants were informed that they could withdraw from the study at any point without facing any negative consequences. The confidentiality and anonymity of the participants were maintained throughout the study. No unnecessary personally identifying information was collected. The data were used only for academic and research purposes and were stored securely.

#### Data Analysis

The collected data were analyzed using SPSS. Descriptive and inferential statistical techniques were used to analyze the data. The Pearson Product-Moment Correlation was used to examine the relationships between smartphone addiction, academic stress, academic procrastination, and academic performance. Multiple regression analysis was also used to determine whether smartphone addiction and academic procrastination significantly predicted academic stress and academic performance. Because academic procrastination was examined as a potential explanatory variable in the relationship between smartphone addiction and the other academic outcomes, mediation analysis was conducted where applicable. The mediation analysis examined whether academic procrastination statistically explained part of the relationship between smartphone addiction and academic stress and/or academic performance. The level of statistical significance was set at  $p < .05$ .

#### Results

**Table 1: Pearson Correlations among Study Variables**

| Variable                    | 1    | 2      | 3      | 4      | <i>M</i> | <i>SD</i> |
|-----------------------------|------|--------|--------|--------|----------|-----------|
| 1. Smartphone Addiction     | —    | .48**  | -.32** | .45**  | 3.21     | 0.64      |
| 2. Academic Stress          | .39* | —      | -.41** | .39**  | 3.34     | 0.71      |
| 3. Academic Performance     | .2   | -.41** | —      | -.36** | 3.18     | 0.58      |
| 4. Academic Procrastination | .5*  | .39**  | -.36** | —      | 3.27     | 0.67      |

*Note.*  $N = 189$ .  $p < .01$ .

The Pearson correlation results indicate significant relationships among all four study variables. Smartphone addiction was positively and significantly correlated with academic stress ( $r = .48$ ,  $p < .01$ ) and academic procrastination ( $r = .45$ ,  $p < .01$ ), suggesting that students with higher levels of smartphone addiction tended to experience greater academic stress and procrastination. In contrast, smartphone addiction was negatively and significantly correlated with academic performance ( $r = -.32$ ,  $p < .01$ ), indicating that greater smartphone addiction was associated with lower academic performance. Similarly, academic stress showed a significant negative relationship with academic performance ( $r = -.41$ ,  $p < .01$ ) and a significant positive relationship with academic procrastination ( $r = .39$ ,  $p < .01$ ). Academic performance was also negatively and significantly correlated with academic procrastination ( $r = -.36$ ,  $p < .01$ ), suggesting that students who procrastinated more tended to have lower academic performance. Overall, the findings indicate that smartphone addiction, academic stress, and academic procrastination are associated with poorer academic performance, whereas higher smartphone addiction and academic stress are associated with greater academic procrastination.

**Table 2: Regression Analysis Predicting Academic Stress from Smartphone Addiction**

| Predictor            | <i>B</i> | <i>SE B</i>           | $\beta$                        | <i>t</i>          | <i>p</i> |
|----------------------|----------|-----------------------|--------------------------------|-------------------|----------|
| Constant             | 1.52     | 0.28                  | —                              | 5.43              | < .001   |
| Smartphone Addiction | 0.57     | 0.08                  | .48                            | 7.49              | < .001   |
| Model                | <i>R</i> | <i>R</i> <sup>2</sup> | Adjusted <i>R</i> <sup>2</sup> | <i>F</i> (1, 187) | <i>p</i> |
| 1                    | .48      | .23                   | .23                            | 56.10             | < .001   |

The regression analysis showed that smartphone addiction significantly and positively predicted academic stress among the participants. Smartphone addiction had a significant positive effect on academic stress,  $B = 0.57$ ,  $SE = 0.08$ ,  $\beta = .48$ ,  $t(187) = 7.49$ ,  $p < .001$ , indicating that higher levels of smartphone addiction were associated with higher levels of academic stress. The model was statistically significant,  $F(1, 187) = 56.10$ ,  $p < .001$ , with  $R = .48$  and  $R^2 = .23$ . Thus, smartphone addiction explained approximately 23% of the variance in academic stress. Overall, these findings suggest that smartphone addiction is a significant positive predictor of academic stress.

**Table 3: Regression Analysis Predicting Academic Performance from Smartphone Addiction**

| Predictor            | <i>B</i> | <i>SE B</i>           | $\beta$                        | <i>t</i>          | <i>p</i> |
|----------------------|----------|-----------------------|--------------------------------|-------------------|----------|
| Constant             | 4.12     | 0.31                  | —                              | 13.29             | < .001   |
| Smartphone Addiction | -0.29    | 0.09                  | -.32                           | -4.64             | < .001   |
| Model                | <i>R</i> | <i>R</i> <sup>2</sup> | Adjusted <i>R</i> <sup>2</sup> | <i>F</i> (1, 187) | <i>p</i> |
| 1                    | .32      | .10                   | .10                            | 21.53             | < .001   |

The regression analysis showed that smartphone addiction significantly predicted academic performance,  $F(1, 187) = 21.53$ ,  $p < .001$ , indicating that the overall regression model was statistically significant. The model explained 10% of the variance in academic performance ( $R^2 = .10$ , adjusted  $R^2 = .10$ ). Smartphone addiction had a significant negative effect on academic performance ( $B = -0.29$ ,  $SE = 0.09$ ,  $\beta = -.32$ ,  $t = -4.64$ ,  $p < .001$ ), suggesting that higher levels of smartphone addiction were associated with lower academic performance. Specifically, a one-unit increase in smartphone addiction was associated with an estimated 0.29-unit decrease in academic performance. Overall, the findings indicate that smartphone addiction is a significant negative predictor of students' academic performance.

**Table 4: Indirect Effect of Smartphone Addiction on Academic Stress through Academic Procrastination**

| Effect                                                           | <i>B</i> | <i>SE</i> | $\beta$ | <i>t</i> | <i>p</i> | 95% CI       |
|------------------------------------------------------------------|----------|-----------|---------|----------|----------|--------------|
| <b>Path a:</b> Smartphone Addiction → Academic Procrastination   | 0.48     | 0.07      | .45     | 6.94     | < .001   | [0.34, 0.62] |
| <b>Path b:</b> Academic Procrastination → Academic Stress        | 0.31     | 0.08      | .29     | 3.88     | < .001   | [0.15, 0.47] |
| <b>Direct effect (c):</b> Smartphone Addiction → Academic Stress | 0.42     | 0.08      | .35     | 5.25     | < .001   | [0.26, 0.58] |
| <b>Total effect (c):</b> Smartphone Addiction → Academic Stress  | 0.57     | 0.08      | .48     | 7.49     | < .001   | [0.42, 0.72] |
| <b>Indirect effect (ab)</b>                                      | 0.15     | 0.05      | —       | —        | —        | [0.07, 0.26] |

A mediation analysis was conducted to examine whether academic procrastination mediated the relationship between smartphone addiction and academic stress. Smartphone addiction significantly predicted academic procrastination,  $B = 0.48$ ,  $SE = 0.07$ ,  $p < .001$ . Academic procrastination significantly predicted academic stress,  $B = 0.31$ ,  $SE = 0.08$ ,  $p < .001$ . The indirect effect of smartphone addiction on academic stress through academic procrastination was significant,  $B = 0.15$ ,  $SE = 0.05$ , 95% CI [0.07, 0.26]. Because the confidence interval did not include zero, academic procrastination significantly mediated the relationship between smartphone addiction and academic stress.

**Table 5: Indirect Effect of Smartphone Addiction on Academic Performance through Academic Procrastination**

| Effect                                                                | <i>B</i> | <i>SE</i> | $\beta$ | <i>t</i> | <i>p</i> | 95% CI         |
|-----------------------------------------------------------------------|----------|-----------|---------|----------|----------|----------------|
| <b>Path a:</b> Smartphone Addiction → Academic Procrastination        | 0.48     | 0.07      | .45     | 6.94     | < .001   | [0.34, 0.62]   |
| <b>Path b:</b> Academic Procrastination → Academic Performance        | -0.24    | 0.07      | -.28    | -3.43    | .001     | [-0.38, -0.10] |
| <b>Direct effect (c):</b> Smartphone Addiction → Academic Performance | -0.18    | 0.08      | -.20    | -2.25    | .026     | [-0.34, -0.02] |
| <b>Total effect (c):</b> Smartphone Addiction → Academic Performance  | -0.29    | 0.09      | -.32    | -3.22    | .002     | [-0.47, -0.11] |
| <b>Indirect effect (ab)</b>                                           | -0.12    | 0.04      | —       | —        | —        | [-0.21, -0.03] |

A mediation analysis was conducted to examine whether academic procrastination mediated the relationship between smartphone addiction and academic performance. Smartphone addiction significantly predicted academic procrastination,  $B = 0.48$ ,  $SE = 0.07$ ,  $p < .001$ . Academic procrastination significantly negatively predicted academic performance,  $B = -0.24$ ,  $SE = 0.07$ ,  $p = .001$ . The indirect effect of smartphone addiction on academic performance through academic procrastination was significant,  $B = -0.12$ ,  $SE = 0.04$ , 95% CI  $[-0.21, -0.05]$ . Thus, academic procrastination significantly mediated the relationship between smartphone addiction and academic performance.

### **Discussion**

The present study examined the impact of smartphone addiction on academic stress and academic performance among university students, with particular emphasis on the mediating role of academic procrastination. The findings indicate that smartphone addiction is an important factor associated with students' academic functioning. Smartphone addiction was positively associated with academic stress and academic procrastination, whereas it was negatively associated with academic performance. Academic procrastination was also positively associated with academic stress and negatively associated with academic performance. Furthermore, the mediation analyses demonstrated that academic procrastination significantly explained part of the relationship between smartphone addiction and both academic stress and academic performance. These findings suggest that excessive and problematic smartphone use may affect students not only directly but also indirectly by encouraging delays in academic activities.

### **Smartphone Addiction and Academic Stress**

The findings demonstrated a significant positive relationship between smartphone addiction and academic stress. Students who reported greater smartphone addiction also tended to experience greater academic stress. This finding suggests that problematic smartphone use may interfere with students' ability to manage academic responsibilities effectively. Excessive engagement with smartphones can consume time that could otherwise be devoted to studying, completing assignments, preparing for examinations, and maintaining regular academic routines. Consequently, students may experience increased pressure when academic tasks accumulate or when deadlines approach. The present finding is consistent with recent research suggesting a meaningful relationship between problematic smartphone use and academic stress. Bhutto et al. (2024), in a study of university students in Pakistan, reported a positive relationship between smartphone addiction and academic stress. Their findings similarly suggested that problematic smartphone use may interfere with students' academic functioning and emphasized the importance of self-regulation in managing smartphone use. Recent research has also demonstrated that smartphone-related problematic behavior may become particularly relevant during academically demanding periods. Ahn et al. (2025), for example, examined problematic smartphone use among university students during examination periods and found that smartphone-related difficulties were associated with psychological and sleep-related problems during academically stressful periods. One possible explanation for this association is that smartphones can provide immediate distraction and temporary relief from academic demands. When students encounter difficult assignments, examination pressure, or feelings of academic inadequacy, they may turn toward easily accessible smartphone activities such as social networking, entertainment, messaging, or browsing. Although such activities may provide short-term emotional relief, they can reduce the time and attention available for academic responsibilities. The resulting delay may increase the number of unfinished tasks and consequently contribute to greater academic stress. Recent research similarly suggests that students may use smartphones as an avoidance or escape strategy when experiencing academic stress. However, the relationship between academic stress and smartphone use should not necessarily be understood as purely one-directional. Academic stress may also encourage students to engage in excessive smartphone use as a coping or avoidance behavior. Wong et al. (2024) found that academic stress was linked to problematic smartphone use through escapism motivation, suggesting that some students may use smartphones to temporarily distance themselves from stressful academic experiences. Therefore, the relationship may involve a reinforcing cycle in which smartphone overuse contributes to academic difficulties and stress, while academic stress may subsequently encourage further smartphone use.

### **Smartphone Addiction and Academic Performance**

The findings further showed a significant negative relationship between smartphone addiction and academic performance. Students with greater smartphone addiction tended to report poorer academic performance. This

finding is consistent with recent empirical and meta-analytic evidence indicating that problematic smartphone use can be associated with reduced academic achievement. Paterna et al. (2024), in a systematic review and meta-analysis, concluded that problematic smartphone use represents a potential determinant of decreased academic achievement. The negative association may be explained by several mechanisms. First, excessive smartphone use can compete with academic activities for students' limited time and attentional resources. Academic learning requires sustained attention, concentration, planning, and persistence. Frequent smartphone checking and engagement with highly stimulating digital content may interrupt these processes and make it more difficult for students to maintain concentration on academic tasks. Second, smartphone use may contribute to ineffective study habits when students frequently switch between academic work and non-academic smartphone activities. Such interruptions may reduce the quality and efficiency of studying even when students spend considerable time appearing to engage in academic work. Another possible explanation is that problematic smartphone use may contribute to sleep disruption and emotional difficulties, which can subsequently interfere with students' academic functioning. Recent research conducted during examination periods has highlighted associations between problematic smartphone use, sleep disturbances, and psychological difficulties among university students. Thus, the academic consequences of smartphone addiction may extend beyond the time directly spent using the device. The present finding is also consistent with research among university students in Pakistan. Bhutto et al. (2024) reported that smartphone addiction was related to academic stress and highlighted its potential detrimental consequences for academic functioning. Taken together, these findings support the argument that although smartphones can be useful educational tools, problematic or uncontrolled use may undermine students' academic functioning.

#### **Smartphone Addiction and Academic Procrastination**

A particularly important finding of the present study was the positive association between smartphone addiction and academic procrastination. Students who demonstrated greater smartphone addiction also tended to engage more frequently in academic procrastination. This finding is strongly supported by recent research. Zhou et al. (2024) conducted a large meta-analysis examining the relationship between mobile phone addiction and procrastination among students and concluded that these variables are positively associated. Similarly, Chen and Lyu (2024) synthesized evidence from multiple student studies and reported a significant positive relationship between smartphone addiction and procrastination. The relationship can be understood from a self-regulation perspective. Academic tasks often require students to tolerate boredom, frustration, effort, and delayed rewards. In contrast, smartphones provide immediate access to entertainment, social interaction, and other rewarding activities. Consequently, students who have difficulty regulating their smartphone use may be more likely to postpone academic tasks in favor of activities that provide immediate gratification. This pattern may gradually develop into habitual academic procrastination. The accessibility of smartphones is particularly important because the device is generally available during study periods. Unlike many other distractions, smartphones can be used immediately and repeatedly without requiring students to leave their study environment. Notifications, social media, entertainment applications, and online communication may therefore provide continuous opportunities for task avoidance. Recent meta-analytic evidence strengthens the interpretation that problematic smartphone use and procrastination are consistently related among students.

#### **Academic Procrastination and Academic Stress**

The findings also demonstrated a positive association between academic procrastination and academic stress. Students who tended to postpone academic tasks were more likely to experience greater academic stress. This finding is theoretically understandable because procrastination can create an accumulation of unfinished academic responsibilities. When students repeatedly delay assignments, studying, or preparation for examinations, they may eventually face greater workload and time pressure. Consequently, procrastination can transform manageable academic demands into more stressful experiences. Recent research supports this interpretation. Turner and Hodis (2023), in a systematic review of interventions targeting academic procrastination, described academic procrastination as a significant self-regulation difficulty that can negatively affect students' academic functioning and well-being. The present findings extend this literature by suggesting that academic procrastination may also be an important mechanism linking problematic smartphone use with academic stress. It is also possible that academic stress and procrastination reinforce one another. Students may postpone academic activities because they feel overwhelmed or anxious about

academic demands. However, postponement leaves important tasks incomplete, which can subsequently increase stress. Smartphone use may intensify this cycle by providing an easily accessible means of avoiding uncomfortable academic experiences. Therefore, procrastination may represent an important behavioral pathway through which students' smartphone habits become connected with academic stress.

#### **Academic Procrastination and Academic Performance**

The present study found a significant negative association between academic procrastination and academic performance. Students who engaged more frequently in academic procrastination tended to demonstrate poorer academic performance. This finding is consistent with recent evidence. A meta-analysis by Kim et al. (2024) found an overall negative relationship between procrastination and academic performance, while also highlighting that different forms of procrastination may have different consequences. Academic procrastination may negatively affect performance because delaying academic tasks reduces the amount of time available for learning, revision, and correction of mistakes. Students who repeatedly postpone their responsibilities may eventually complete academic tasks under considerable time pressure, limiting the opportunity to engage in deeper learning. Procrastination may also reduce preparation for examinations and increase reliance on last-minute studying. These behaviors can negatively affect the quality and consistency of academic performance. The present findings therefore support the view that academic procrastination is not merely an undesirable habit but an important academic behavior that may have meaningful consequences for students' educational outcomes. The systematic review by Turner and Hodis (2023) similarly emphasized the importance of addressing procrastination through interventions aimed at improving students' self-regulation and academic behavior.

#### **Mediating Role of Academic Procrastination in the Relationship between Smartphone Addiction and Academic Stress**

One of the most important contributions of the present study is the finding that academic procrastination significantly mediated the relationship between smartphone addiction and academic stress. This finding indicates that smartphone addiction may contribute to academic stress partly because excessive smartphone use is associated with greater academic procrastination. The mediation pathway suggests a behavioral process in which students who experience problematic smartphone use may be more likely to postpone academic responsibilities. These delays can result in unfinished work, reduced preparation, increased deadline pressure, and a growing sense of academic burden. Academic procrastination may therefore serve as an important mechanism connecting smartphone addiction with academic stress. This interpretation is supported by recent research examining the relationship among these variables. Wilhelmina and Nugraha (2026) specifically examined academic procrastination as a mediator between smartphone addiction and academic stress among college students. Their work provides particularly relevant contemporary evidence for the present findings because it addresses the same conceptual pathway. In addition, the broader meta-analytic literature has consistently identified a positive relationship between smartphone addiction and procrastination among students. The mediation finding is also important because it indicates that the relationship between smartphone addiction and academic stress cannot be understood only in terms of the amount of smartphone use. The behavioral consequences of smartphone use may be equally important. When smartphone use interferes with self-regulation and task completion, students may become increasingly vulnerable to academic stress. Therefore, interventions aimed at reducing academic stress may benefit from addressing procrastination and smartphone-related self-regulation simultaneously. Because the direct relationship between smartphone addiction and academic stress remained significant after academic procrastination was considered, the findings suggest that academic procrastination explains only part of this relationship. Other mechanisms may also contribute, including sleep disruption, emotional distress, escapism, attentional difficulties, and reduced self-regulation. Recent research has identified several of these mechanisms as relevant to problematic smartphone use and academic stress.

#### **Mediating Role of Academic Procrastination in the Relationship between Smartphone Addiction and Academic Performance**

Academic procrastination also significantly mediated the relationship between smartphone addiction and academic performance. This finding indicates that smartphone addiction may be associated with poorer academic performance partly because students who engage in problematic smartphone use are more likely to postpone academic activities. This pathway provides a useful explanation for the negative relationship

between smartphone addiction and academic performance. Smartphone addiction may interfere with students' self-regulation, making it more difficult to resist immediate digital rewards and prioritize academic responsibilities. Increased procrastination may then reduce study time, delay assignment completion, interfere with examination preparation, and ultimately contribute to poorer academic outcomes. The finding is consistent with recent meta-analytic evidence showing a positive relationship between smartphone addiction and procrastination and a negative relationship between procrastination and academic performance. Thus, the present findings bring these two strands of research together by suggesting that academic procrastination may function as a behavioral mechanism through which smartphone addiction is associated with academic performance. The continued significance of the direct relationship between smartphone addiction and academic performance indicates that academic procrastination does not fully account for the association. Other pathways are therefore likely to be involved. For example, excessive smartphone use may affect academic performance through attentional distraction, sleep-related problems, reduced concentration, emotional difficulties, or inefficient study habits. Paterna et al. (2024) similarly suggested that problematic smartphone use may represent a potential contributor to reduced academic achievement.

## Conclusion

The present study concludes that smartphone addiction is significantly associated with important academic difficulties among university students. Greater smartphone addiction was associated with greater academic stress and poorer academic performance. Smartphone addiction was also associated with greater academic procrastination, while academic procrastination was related to greater academic stress and poorer academic performance. Most importantly, academic procrastination emerged as a significant mediator in the relationships between smartphone addiction and both academic stress and academic performance. These findings indicate that problematic smartphone use may influence students' academic functioning partly through the tendency to delay or avoid academic responsibilities. Therefore, academic procrastination represents an important behavioral mechanism that should be considered when examining the academic consequences of smartphone addiction. The findings have important implications for university students, educators, counselors, and academic institutions. Efforts to address smartphone-related academic difficulties should extend beyond simply reducing smartphone use and should also promote effective self-regulation, time management, task initiation, and procrastination-management skills. Helping students develop healthier patterns of smartphone use and more effective academic behaviors may contribute to better academic adjustment and reduce unnecessary academic stress. The study highlights the interconnected nature of smartphone addiction, academic procrastination, academic stress, and academic performance. Smartphones can provide substantial educational and social benefits, but problematic use may become detrimental when it interferes with students' ability to regulate their attention and academic behavior. Addressing both smartphone-related behaviors and academic procrastination may therefore provide a more comprehensive approach to supporting university students' academic success and well-being.

## References

- Ahn, J. S., Jeong, I., Park, J. Y., et al. (2025). App-based ecological momentary assessment of problematic smartphone use during examination weeks in university students: 6-week observational study. *Journal of Medical Internet Research*, 27, e69320.
- Anwar, P., Munir, S., Arif, M. O., Faisal, A., et al. (2025). Problematic smartphone use and academic procrastination among students in Pakistan. *Journal of Asian Development Studies*, 14(1), 1065–1070. <https://doi.org/10.62345/jads.2025.14.1.85>
- Bhutto, M., Memon, N. A., & Ali, Z. (2024). Smartphone addiction and student learning: A study on university students in Karachi. *Journal of Development and Social Sciences*, 5(1), 696–702. [https://doi.org/10.47205/jdss.2024\(5-1\)62](https://doi.org/10.47205/jdss.2024(5-1)62)
- Bhutto, M., Memon, N. A., & Ali, Z. (2024). Smartphone addiction and student learning: A study on university students in Karachi. *Journal of Development and Social Sciences*, 5(1), 696–702. [https://doi.org/10.47205/jdss.2024\(5-1\)62](https://doi.org/10.47205/jdss.2024(5-1)62)
- Chen, G., & Lyu, C. (2024). The relationship between smartphone addiction and procrastination among students: A systematic review and meta-analysis. *Personality and Individual Differences*, 224, 112652. <https://doi.org/10.1016/j.paid.2024.112652>

- Crowhurst, J., et al. (2024). Risk factors of smartphone addiction: A systematic review of longitudinal studies. *Public Health Challenges*. <https://doi.org/10.1002/puh2.202>
- Ghafoor, R. Z., Nawaz, S., Zahra, T., & Abdul Hakeem, T. (2022). Effect of smartphone addiction on academic performance; mediation of self-regulation and bedtime procrastination. *Pakistan Journal of Medical & Health Sciences*, 16(9), 618. <https://doi.org/10.53350/pjmhs22169618>
- Hsieh, C.-Y. (2025). The impact of smartphone usage frequency on university students' academic performance: A meta-analysis of moderating factors. *Acta Psychologica*, 259, 105374. <https://doi.org/10.1016/j.actpsy.2025.105374>
- Iqbal, I., Raza, M. A., Nasim, F., & Naheed, F. (2023). Relationship among smartphone addiction, interpersonal relationships and academic stress at university level. *Pakistan Journal of Humanities and Social Sciences*, 11(3). <https://doi.org/10.52131/pjhss.2023.1103.0625>
- Khan, M. A., et al. (2020). Smartphone use and academic performance of university students: A mediation and moderation analysis. *Sustainability*, 12(1), 439. <https://doi.org/10.3390/su12010439>
- Mohd Amin, N. A. F., Tuan Ismail, T. N. N., Ponnuraj, K. T., & Shahidan, W. N. S. (2024). Psychosocial impact of smartphone addiction among university student: A review. *Malaysian Journal of Medicine and Health Sciences*, 20(1), 343–358. <https://doi.org/10.47836/mjmhs.20.1.42>
- Paterna, A., Alcaraz-Ibáñez, M., Aguilar-Parra, J. M., Salavera, C., Demetrovics, Z., & Griffiths, M. D. (2024). Problematic smartphone use and academic achievement: A systematic review and meta-analysis. *Journal of Behavioral Addictions*, 13(2), 313–326. <https://doi.org/10.1556/2006.2024.00014>
- Paterna, A., Alcaraz-Ibáñez, M., Aguilar-Parra, J. M., Salavera, C., Demetrovics, Z., & Griffiths, M. D. (2024). Problematic smartphone use and academic achievement: A systematic review and meta-analysis. *Journal of Behavioral Addictions*, 13(2), 313–326. <https://doi.org/10.1556/2006.2024.00014>
- Sohn, S. Y., et al. (2023). Problematic smartphone usage, prevalence and patterns among university students: A systematic review. *Journal of Affective Disorders Reports*, 14, 100643. <https://doi.org/10.1016/j.jadr.2023.100643>
- Su, M., Zhang, J., Xu, Y., & Hu, J. (2025). The relationship between smartphone addiction, academic procrastination, and anxiety: Evidence from a diary-based approach. *Acta Psychologica*, 260, 105517. <https://doi.org/10.1016/j.actpsy.2025.105517>
- Turner, M., & Hodis, F. A. (2023). A systematic review of interventions to reduce academic procrastination and implications for instructor-based classroom interventions. *Educational Psychology Review*, 35, 118. <https://doi.org/10.1007/s10648-023-09838-x>
- Wong, B. Y., Yeo, K. J., & Lee, S.-H. (2024). How and for whom academic stress causes problematic smartphone use: The role of escapism motivation and present hedonistic time perspective. *SAGE Open*. <https://doi.org/10.1177/21582440241302169>
- Zhao, X., Wang, H., Ma, Z., Zhang, L., & Chang, T. (2025). Smartphone addiction and academic procrastination among college students: A serial mediation model of self-control and academic self-efficacy. *Frontiers in Psychiatry*. <https://doi.org/10.3389/fpsyt.2025.1572963>
- Zhou, X., Yang, F., Chen, Y., & Gao, Y. (2024). The correlation between mobile phone addiction and procrastination in students: A meta-analysis. *Journal of Affective Disorders*, 346, 317–328. <https://doi.org/10.1016/j.jad.2023.11.020>
- Zhou, X., Yang, F., Chen, Y., & Gao, Y. (2024). The correlation between mobile phone addiction and procrastination in students: A meta-analysis. *Journal of Affective Disorders*, 346, 317–328. <https://doi.org/10.1016/j.jad.2023.11.020>