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SMARTPHONE ADDICTION, SELF-ESTEEM AND ACADEMIC PERFORMANCE AMONG UNIVERSITY STUDENTS, PUNJAB, PAKISTAN

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Abstract
Nowadays usage of smartphone has become common among university students (Fook et al., 2021). Mostly students not use their smartphone in right way and fail to maintain balance between it's for academic purpose and for entertainment (Olasina & Kheswa, 2021). The aim of this study was to explore the relationship between smartphone addiction, academic performance, and self-esteem among university students. Cross sectional research design was used in this research. The population of this study was male & female students of public, and private universities of Punjab, Pakistan. Stratified random sampling technique was used to collect the data for current study. Sample size was 500 (250 male and 250 female students) of government and private university students. Age range of students was 15-30 year. In the current study following scales were used to measure the variables including Smartphone Addiction Short Version Scale (SAS-SV), Rosenberg Self-esteem Scale, and Achievement Goal Questionnaire Revised (AGQ-R). Data was analyzed by using correlation, linear regression and independent sample T-test. Results showed that male students more smartphone addict than female students. There is significant but negative relationship between smartphone addiction, and self-esteem. Smartphone addiction, and academic performance also has negative relationship. Additionally, students at private institutions tend to exhibit higher levels of smartphone addiction compared to those at public institutions.

INTRODUCTION

Nowadays usage of smartphone has become common among university students (Fook et al., 2021). Mostly students not use their smartphone in right way and fail to maintain balance between it's for academic purpose and for entertainment (Olasina & Kheswa, 2021). When student use their smartphone excessively and aimlessly, they become addict (Chen, 2023). This addiction highly influenced their self-esteem and academic performance (Olaoye et al., 2020). In order to raise academic performance and guide them in the proper path. Numerous researchers have explored how smartphones influence different aspects of life, including their use across various sectors and age groups (Busch et al., 2021).

Nowadays, people's daily life would be impossible without their cell phones (Xiao, 2020). Everyone, regardless of age, uses a mobile phone these days (Agustin et al., 2021). People as young as 12 or 13 commonly use mobile phones (Richter et al., 2022). Smartphones offer a wide range of functions, from

making calls and sending emails to browsing the internet, managing contacts, and using voice search (Wanga et al., 2020). They also allow users to take and share photographs and videos, listen to music, stay updated with news and weather. They communicate through messaging applications like WhatsApp, and connect with others on social media platforms such as Instagram, Facebook, and Snapchat (Ng & Yap, 2024).

Numerous facets of daily life have been completely transformed by the advent of smart-phones **(Swamy, 2020).** They are portable, multipurpose gadgets that can perform the duties of both phones and computers (Liu, 2023). Furthermore, the smartphone is an essential instrument for quick and simple access to a variety of information online (Mohamed et al., 2020). Not only have smartphones supplanted smart-phones, but they have also partially supplanted individual computers and numerous other gadgets (Raza et al., 2020). Numerous features can be accessed at any time and from any location because to their huge screen size and built-in mobility (Cordella et al., 2021).

Globally, smart-phones are becoming an essential part of people's life at all ages **(Mushroor et al., 2020).** Individuals feel unable to live without their smartphones (Miller et al., 2021). For example, according to recent data from the Pew Research Centre, 46% of smartphone owners in the USA stated that they "could not live without" their device (Palm, 2020). Furthermore, 15% of young adults in America between the ages of 18 and 29 are categorized as being very reliant on cellphones for accessing the internet (Olson et al., 2022). However, there are drawbacks to excessive and problematic cell phone use, such as poor academic performance (Akinci, 2021).

Students primarily used their smartphones for social networking (91.6%), messaging (98.1%), internet visits (89.7%), and gaming (84.1%) (Mohamed et al., 2020). According to reports, people use cellphones significantly more for social activities. The main way to reach a social network than for educational purposes (Gomez-Galan et al., 2020). Concerns over students' excessive smartphone use have recently been raised by an expanding corpus of published studies. A statistically significant distribution in regular everyday activities brought on by excessive smartphone use is known as smartphone addiction (Wacks et al., 2021).

In general, one type of behavioral dependance is smart-phone addiction (James et al., 2023). Behavioral addictions are characterized by several key features, including heightened salience, mood fluctuations, compulsive behavior, increased tolerance, difficulty with self-control, withdrawal symptoms, deceptive behavior, excessive use, loss of interest in other activities, and both interpersonal and intrapersonal conflicts along with a tendency to relapse (Lopez-Fernandez & Kuss, 2020). Behavioral addictions share several important similarities with substance addictions, particularly when it comes to functional impairments and the presence of intense withdrawal symptoms (Nawaz et al., 2024).

Addiction to smartphones affects users' mental and behavioral health, making it a serious public health issue (Loleska et al., 2021). Prior research has connected smartphone addiction to poor behavioral attitudes, poor academic and professional performance, trouble interacting with others, and interpersonal issues (Fook et al., 2021). Unnecessary cellphone use has been linked to several physical health concerns, including headaches, musculoskeletal discomfort, eye strain, and potential hearing issues (Zhu et al., 2025).

Previous studies have shown that personality plays a significant influence in mobile phone addiction (Yan et al., 2024). The usage of smartphones has been transforming social interactions, family relationships, emancipative values, daily routines, and habits (Mahmud & Islam, 2023). Constantly checking and/or using smartphone apps around-the-clock has been connected to a number of negative outcomes, including poorer academic performance, less physical activity, stress, anxiety, withdrawal and a decline in wellbeing, and disturbed sleep (Nikolic et al., 2023).

This study purposes to explore the relationship between smartphone addiction, academic performance, and self-esteem among university students. As the previous researches in Pakistan have shown no interest in finding the gender differences of university students with smart-phone addiction. This research also reveals that which gender more influenced by smartphone addiction or which gender have higher proportion of smartphone addiction. Students will advantage from this research study since it will give them reliable information regarding how smart-phones affect academic performance. Teachers

will gain knowledge about how smartphone addiction affects students' performance and learn how to manage, correct, and instruct students. The effects of smart-phone addiction will be known and understood by parents to raise academic performance and be able to guide students in the proper way.

Smartphone Addiction

Excessive reliance on cell phones can lead to addiction (Abd Rashid et al., 2020). Smartphone addicts spent a plenty of time in using their smartphone (Fook et al., 2021). Smartphone addiction significantly depends upon how long an individual use smartphone during a day (Sunday et al., 2021). Substances and substance abuse are no longer the only factors contributing to addiction (Nawi et al., 2021). It also encompasses behaviors such as excessive internet gambling, gaming, and even the overuse of smartphones, all of which are forms of addiction (Warburton, 2021).

According to the researches people who use smartphone four are more than four hour per day are fall are more likely to exhibit behaviors associated with addiction (Nikolic et al., 2023). Such people have more problems in psychological, health as compare to those who use smartphone less than four hour per day (Cha & Seo, 2018). A global study from 2014 found that approximately 1.85 billion people were using mobile phones. By 2017, that number had risen to an estimated 2.32 billion, and by 2020, it reached 2.87 billion (Dahunsi et al., 2023). Teenagers tend to use mobile phones more frequently than older adults (Porter et al., 2020).

Self-esteem

Self-esteem is a fundamental concept in the social sciences and is widely used in everyday life (Pathak & Mhaske, 2019). Self-esteem is "the satisfaction or dissatisfaction with oneself". This phrase describes a personality trait that encapsulates people's overall self-perception. A widespread affection for oneself is a symbol of high self-esteem. Mildly pleasant feelings towards oneself are a sign of low self-esteem. It refers to how much a person values, accepts, and appreciates themselves (Nabirye, 2023). Self-esteem is a construct from the social sciences and can be measured by looking at a person's central personality or psychological traits (AlHarbi, 2022).

Smartphone Addiction and Self-esteem

Smartphone addiction has emerged as a growing concern among university students, significantly affecting their psychological and academic wellbeing (Alotaibi et al., 2022). The excessive and compulsive use of smartphones is associated with symptoms such as anxiety, poor sleep quality, and reduced face-to-face interactions, which can in turn negatively impact self-esteem (Wacks et al., 2021). Mun (2024) found a significant negative correlation between smartphone addiction and academic self-efficacy, which indirectly affected students' self-esteem and academic outcomes. The most recent research is that all of these people with low self-esteem are interacting on the web (Casale et al., 2022). As a result, people often turn to their smartphones to seek support and validation from others. In doing so, they fulfill their need for self-esteem, which they may not be able to achieve in the physical world through direct interactions (Stenly, 2021). Recent studies have shown a strong correlation between adolescent social support, self-esteem, self-control and smartphone addiction (Ding et al., 2022). These studies suggest that young people with lower self-esteem tend to spend more time on social networking sites compared to those with higher self-esteem (Bahrainian et al., 2014).

Smartphone Addiction and Academic Performance

Due to their focus on music, chat, and other aspects, students' academic pursuits are neglected and suffer as a result of the significant negative influence of social media (Astatke et al., 2023). There is a strong correlation between academic performance and smartphone use in the classroom. Students' excessive use of smartphones is the main factor contributing to their subpar academic performance (Pathak & Mhaske, 2019)

Rationale of the Study

Most young people today suffer from smartphone addiction and dependence. As technology progresses, smartphone addiction has grown to be a severe issue that spreads quickly. Students find it extremely challenging to strike a balance between studying and excessive smartphone use. The influence of cellphones and their use by various demographics has been examined by a number of studies. Additionally, several researchers have explored the impact of

smartphone use and dependance among students. However, there is a lack of related studies conducted in Pakistan, and little care has been given to understanding the effects of smartphone addiction among university students in Punjab, Pakistan.

As smartphone addicts have lack of control over their actions and compulsion with behavioral addiction can make individual feel guilty, embarrassed and ashamed. These negative feelings can quickly spiral and individuals may feel like they are not good enough or worthy of love and affection. Addiction can significantly reduce one's sense of self-esteem, leading to feelings of isolation and depression. This study goals to explore the association between smartphone addiction, and academic performance among university students in Punjab, Pakistan. It will also examine how smartphone addiction relates to self-esteem and encourage students to seek help in overcoming addiction and rebuilding their self-esteem.

Previous researches in Pakistan have largely overlooked gender differences among university students struggling with addiction. This study also aims to explore those differences specifically in relation to smartphone addiction. The findings will offer students valuable insights into how smartphone use can influence their academic performance. The study assisted in determining the most common times for pupils to use their smartphones. Teachers will gain knowledge about how smartphone addiction affects students' performance and learn how to manage, correct, and instruct students. The effects of cell phone addiction will be known and understood by parents to raise academic performance and be able to guide kids in the proper way.

Statement of the Problem

Smartphones are increasingly becoming valuable tools in teaching and learning, particularly in online education. They offer flexible access to course content, allow students to navigate learning platforms, retrieve educational resources, and participate in digital communication with ease (Raza et al., 2023). However, with young people, particularly students becoming increasingly dependent on technology in all areas of life, the number of individuals showing signs of smartphone addiction continues to grow (Sandua, 2024). As a result, there is a need for in-depth research to better understand whether this growing reliance on smartphones supports students' academic success or hinders it (Rathakrishnan et al., 2021).

In the studies backing it, smartphone addiction is a problem that's rampant globally (Olson et al., 2022). This is particularly important in Pakistan and other developing countries, where awareness of the potential harmful effects of excessive smartphone use remains limited (Khan et al., 2023). It is now the most crucial subject of conversation. This study will contribute to increasing public awareness of the detrimental impacts of smartphone addiction, particularly among young people. Teens will be encouraged by this research to adopt healthier lifestyles and engage in more constructive activities rather than wasting their valuable time on gaming and social media.

Objectives of the Study

The primary aims of this study are as follows:

1. To explore how smartphone addiction is linked to self-esteem in university students.
2. To examine the relationship between smartphone addiction and academic performance among university students.
3. To investigate gender differences in patterns of smartphone use.

Hypotheses

1. There will be significant impact of Smartphone addiction on self-esteem among university students in Punjab, Pakistan.
2. There will be significant impact of Smartphone addiction on academic performance among university students in Punjab, Pakistan.
3. There will be significant difference of smartphone addiction, self-esteem, and academic performance among male and female university students in their patterns of smartphone use.

Research Significance

The relevance of this research is that it demonstrates that the findings offer advice to college and university students on whether or not smartphone addiction can help them succeed academically. This study will contribute to increasing public awareness of the detrimental impacts of smartphone addiction, particularly among young people. This study will

benefit students since it will reveal the real impact of mobile gadgets on academic performance. Teens will be encouraged by this research to adopt healthier lifestyles and engage in more constructive activities rather than wasting their valuable time on gaming and social media. Teachers will gain understanding on how to manage, enforce, and instruct students' behavior as well as the impact smartphones have on students' academic performance. By learning more about how mobile phone addiction affects academic performance, parents will be better equipped to guide their students.

LITERATURE REVIEW

Smartphone addiction is becoming more common among university students and has negative psychological and academic effects (Alotaibi et al., 2022). Numerous cognitive, behavioral, and emotional dysfunctions have been connected to smartphone addiction, which is characterized by excessive, uncontrollable smartphone use that disrupts daily living (Olasina & Kheswa, 2021). Smartphones are most significant among the various technical devices (Cordella et al., 2021). The rise in smartphone usage over recent years has contributed significantly to the expansion of the broadband and internet service provider industry (Simon, 2020).

The advanced features of smartphones have enhanced the effectiveness and reach of the advertising industry (Yus, 2023). Smartphones are now a different way to deliver educational services. Distance learning via smartphones facilitates student's work in education (Garlinska et al., 2023). Smartphones have become a valuable gateway to a wide range of educational and learning resources (Zhampeissova et al., 2020). Additionally, it enables students to communicate via social networking sites, play online games, check their emails, and send messages (Ansari et al., 2020).

It's crucial to distinguish between constructive and destructive use of smartphones as students use them more and more for both academic and recreational purposes (Nawaz, 2024). Another study revealed a negative association between academic performance and stress, with a higher risk of smartphone addiction. In contrast, academic achievement was positively associated with life satisfaction, while stress had a negative impact on it. The study found that by raising stress levels and decreasing academic achievement, smartphone addiction indirectly affects life satisfaction (Samaha et al., 2016).

According to the literature a study conducted in Thailand, researchers explored how psychological and behavioral factors influence grit and academic performance. The study involved 989 nursing students who completed a paper-based survey assessing smartphone addiction, self-esteem, depression, anxiety, stress, grit, GPA, and demographic data. The findings indicated that grit had a negative correlation with depression ($r = -0.51$), anxiety ($r = -0.37$), stress ($r = -0.42$), and smartphone addiction ($r = -0.36$). However, grit was positively associated with self-esteem ($r = 0.56$), with all relationships being statistically significant ($p < 0.001$). Additionally, GPA showed a positive relationship with both grit and self-esteem, while it was negatively associated with depression. Regression analysis revealed self-esteem, smartphone addiction, and depression as significant predictors of grit (adjusted $R^2 = 0.379$). The study emphasizes the role of mental health and self-worth in fostering grit, a trait closely tied to academic success in nursing education (Hanklang et al., 2024).

Overall, the literature emphasizes the interconnectedness of smartphone addiction, self-esteem, and academic performance, highlighting the need for comprehensive intervention strategies targeting digital literacy and psychological resilience among university students (Qi & Yang, 2024).

RESEARCH METHODOLOGY

Research Model

To support the research, a model was developed that aligns with the study's objectives.

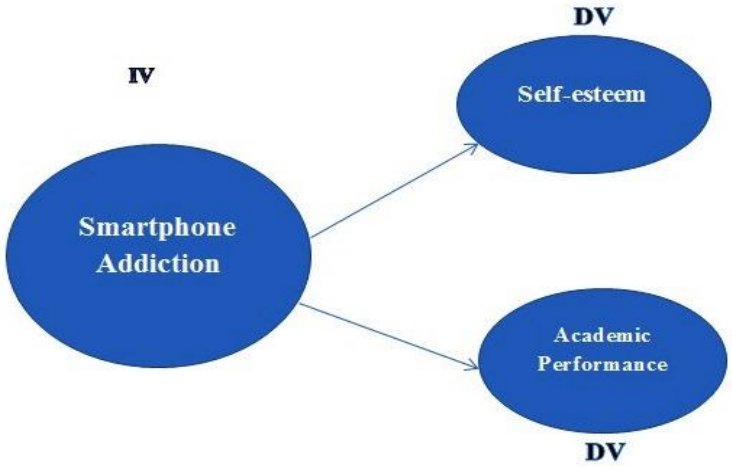

Figure: Research Model

Research Design

This was a cross-sectional study in order to encourage the students to seek help to overcome smart-phone addiction and to rebuild their self-esteem. The sample size was calculated with a 95% confidence interval.

Research Sample and Population

The population of current study was focused on university students of Punjab, Pakistan from different public and private universities with their age ranging from 15 to 30 years. The total sample size in this study was (N= 500) male and female students selected from numerous public and private institutions of Punjab, Pakistan. The stratified random sampling technique was used in the present study to gather data from the sample.

Inclusion and Exclusion Criteria

The sample included university students from Punjab, Pakistan, who use smartphones. Students who did not practice smartphones were excluded from the study.

Instruments

Smartphone Addiction Short Version Scale (SAS-SV)

Ten items make up the SAS-SV, and answers range from "strongly disagree" to "strongly agree" on a six-point Likert scale. Higher ratings indicate problematic smartphone use; total scores range from 10 to 60. The scale's Cronbach's alpha was 0.87, indicating good internal consistency (Kwon et al., 2013).

Rosenberg Self-esteem Scale

The self-esteem scale is a 10-item self-report measure of total self-esteem that consists of ten items intended to evaluate different dimensions of self-worth, capturing both positive and negative thoughts about oneself. Ratings were given on a four-point Likert Scale (1= "strongly disagree"; 4= "strongly agree"). Items 2, 5, 6, 8, and 9 were reverse-scored. The internal consistency of the scale was good (Cronbach's alpha = 0.82), similar to that of a prior study (Rosenberg, 1979).

Achievement Goal Questionnaire–Revised (AGQ-R)

The Achievement Goal Questionnaire–Revised (AGQ-R) A 12-item scale to measure the various types of academic motivation. Participants were asked to rate each item using a 1 to 5 Likert scale with 1 indicating "strongly disagree" and 5 indicating "strongly agree". Research findings indicate AGQ-R subscales' Cronbach's alpha values usually fall between α=.70 and α=.97 or comparable, with many values above .70 (Elliot & Murayama, 2008).

Demographic Performa

A variety of demographic factors, including age, gender, sector, and smartphone usage time slots, were also chosen for this study. The creators of each instrument gave their consent for their use.

Research Procedure

We obtained formal informed consent for data collection from university administration. Every tool used in the evaluation procedures was administered in a group setting. After explanation the purpose of the study and protecting their privacy, all of the participants were contacted in their classroom. They were given spoken instructions and offered guidance as they completed the surveys. They took about thirty to thirty-five minutes to finish the assessment procedures. At the conclusion of the data gathering process, their questions were answered and a debriefing was conducted.

RESULTS AND DISCUSSION

Results

Details of results discussed in the following tables.

Table 1: Demographic Characteristics of Sample (500)

Variable		M	SD	F	%
Age		17.33	0.77		
Gender	Male			250	50
	Female			250	50
Sector	Govt			250	50
	Private			250	50
Time slots	6-am to 9-am			29	5.8
	9-am to 12-am			29	5.8
	12-pm to 1-pm			43	8.6
	1-pm to 4-pm			89	17.8
	4-pm to 8-pm			173	34.6
	8-pm to 2-am			137	27.4

Note: M= Mean, SD= Standard Deviation and f= frequency

Table 1 presents the demographic characteristics of the sample (N = 500), with a mean age of 17.33 years (SD = 0.77). The sample consisted of an equal distribution of gender and employment sector, with 50% male and 50% female participants, and 50% each from government and private sectors. Regarding preferred time slots, 5.8% of participants selected 6am–9am and 9am–12am each, 8.6% chose 12pm–1pm, 17.8% preferred 1pm–4pm, 34.6% opted for 4pm–8pm, and 27.4% favored the 8pm–2am slot.

Table 2: Correlation Among Smartphone Addiction, Self-esteem and Academic Performance

	Variables	1	2	3
	1-Smart-Phone Addiction	1		
	2-Self-Esteem	-0.302	1	
	3-Academic Performance	-0.131	0.235	1

Note: SA = Smartphone Addiction, SE = Self-esteem, AP = Academic Performance. *p < .01

Table 2 presents the correlation results, indicating that smartphone use is significantly and negatively associated with both academic performance (r = –.131, p < .01) and self-esteem (r = –.302, p < .01). In contrast, academic performance and self-esteem show a significant positive relationship (r = .235, p < .01).

Hypothesis I: There will be significant impact of Smartphone addiction on self-esteem among university students in Punjab, Pakistan.

Table 3: Summary of Linear Regression Analysis with Smartphone Addiction as Predictors of Self-esteem in College Students (N= 500)

Predictor	R	R^2	F	df	Sig.
SA	0.302	0.091	49.39	1, 498	.000

Note: *SA= Smartphone Addiction, *p < 0.001

Table 3 summarizes the results of the regression analysis. The findings show that smartphone addiction is a significant predictor of self-esteem, F (1, 498) = 49.39, p < .001. The R Square value of .091 suggests that smartphone addiction accounts for approximately 9.1% of the variance in self-esteem. In other words, these results indicate that increased smartphone addiction is associated with a measurable, though modest, decrease in students' self-esteem.

Hypothesis II

There will be significant impact of Smartphone addiction on academic performance among university students in Punjab, Pakistan.

Table 4: Summary of Linear Regression Analysis with Smartphone Addiction as Predictors of Academic Performance in College Students (N= 500)

Predictor	R	R^2	F	df	Sig.
SA	.131	.017	8.67	1	.003

Note: SA= Smartphone Addiction, **p < .01

The table shows that academic performance was strongly predicted by smartphone addiction (F (1,498) = 8.67, p<0.01). Additionally, the model's R square=.017 shows that the linear effect of smartphone addiction accounts for 1.7% of the variation in academic performance. Addiction to smartphones has a significant impact on students' academic achievement. It is the major factor of student's poor academic performance. Value of R square indicates that smartphone addiction can affect the student's academic performance 1.7%.

Hypothesis III

There will be significant difference of smartphone addiction, self-esteem, and academic performance among male and female university students in their patterns of smartphone use.

Table 5: Gender (male vs female) Differences in Smartphone Addiction (N=500)

Variable	Male (n = 250)		Female (n = 250)		t		95%CI		
	M	SD	M	SD		P	LL	UL	df
SA	42.31	9.81	37.88	9.22	5.20	.000	2.76	6.11	498

Note: Cl= Confidence interval and SA= Smartphone Addiction, p< .001

Male and female smartphone addiction was compared using an independent-sample t-test. Significant differences exist (p=.000, t (498) = 5.20). The results indicate that male students had a higher average score (M = 42.31, SD = 9.81) compared to female students (M = 37.88, SD = 9.22). This difference in mean scores was statistically significant, with a mean difference of 4.43 and a 95% confidence interval ranging from 2.76 to 6.11. Thus, results of table shows that male students are more addict of smartphone than female students.

Discussion

The study attempted to investigate the impact of smartphones on the academic performance and self-esteem of university students from Pakistan's Punjab region, as well as the disparities in smartphone use between genders. Self-research techniques were employed in the study to gather data. Research has indicated that smartphones have a detrimental impact on students' self-esteem. This is consistent with existing literature where similar results have been reported (Mohd Salleh Sahimi et al., 2022).

Table no 1 shows that out of 500 students, 173 used smartphones between 4 and 8 p.m., 137 between 8 and 2 a.m., and 89 between 1 and 4 p.m., or 43 pupils. The findings suggest that students tend to use their smartphones consistently throughout the day, particularly between 9:00 a.m. and midnight, and even into the early morning hours. The percentage of usage across various time slots—9:00 a.m. to 12:00 a.m., and from 6:00 a.m. onward—was reported as 17.7%, 13.9%, 9%, 0%, 4.4%, 2.9%, and 2.9%, respectively. The descriptive analysis also showed that the average age of those with signs of smartphone addiction was around 17 years. These supports growing concerns that adolescents are particularly vulnerable to the mental health impacts associated with excessive smartphone use (Cho, 2020).

The results indicated that smart-phone use had a significant negative effect on student's self-esteem. The results verified a research in which the students who used their mobile phones less, any of low self-esteem among them were not found (Amez & Baert, 2020). It is possible to say this because students' self-esteem typically declines when they have no one close by to talk to. However, increasing the amount of time spent on mobile phones won't dispel this impression. These findings extend prior work in that they shed light on how smart-phone use lowers student's self-esteem (Spiratos, 2021).

Students just sit around playing with their iPhones. And in doing so, they lose out on some pretty substantive areas of their lives that they feel they are unworthy and less for having been excluded from. To defend themselves against this social pariah, these individuals frequent social both social network services and Web games (Ahmed et al., 2020). Many students appear to be addicted to their phones, spending almost every waking moment attached to them (Arumugam et al., 2020).

This pattern of use is in parallel with that seen in previous research in similar contexts. One study, for example, found that while social networking site (SNS) use was associated with a stronger perception of social belonging, a high level of entanglement in emotional activities on these platforms was associated with lower self-esteem and more symptoms of depression (Vidal et al., 2020). These findings particularly highlight the complexity of the impact of smart phone usage on students' mental health (Piteo & Ward, 2020).

Since findings of young and middle-aged individuals' OGD provided relatively no causal significance between problematic smartphone use and self-esteem, the results might show that excessive smartphone use does not correlate as a direct path to self-esteem (Casale
et al., 2022). No clear association was found in the same cases between high smartphone usage and participants' self-esteem. This underscores the importance of considering additional factors in when examining the psychological consequences of smartphone overuse (Kim et al., 2020).

The focus of this work is on SNS addiction, a subcategory of smartphone use, and does not consider other types of smartphone use. It does not cover other conditions for example overall reliance on smartphones or the likelihood that using a smartphone in a meaningless or excessive way might also have an effect on self-value. University students struggled to retain knowledge when relying on smartphones, the poll found. This is in accordance with the literature and finding similar results (Rathakrishnan et al., 2021). The literature implies that students are distracted during calls and student performance suffers as a result (Farooq et al., 2021).

The regression analysis suggests that daily distractions, particularly from smartphone use, significantly hinder student performance. Students who frequently use smartphones often find themselves distracted, which negatively affects their academic outcomes (Suah, 2023). Smartphone addiction can cause students to neglect school-related responsibilities, especially homework. They often become so absorbed in their devices that they fail to plan for assignments and exams properly. Moreover, while students may have

positive expectations about smartphone use, it can ultimately have a negative impact on their academic performance (Lin et al., 2021).

According to the study's findings, pupils think using smartphones improves their lives. However, it also has a detrimental effect on academic achievement. Our way of life has been completely transformed by smartphones. However, these qualities have the potential to become addicting and disrupt our concentration. The findings of this investigation align with existing knowledge in the sector. Many smartphones affect student's ability to focus on their studies (Abo-Ali et al., 2022).

According to this study, male students were more prone than female students to become addicted to smartphones. This suggests a higher prevalence of smartphone addiction among male students in the sample (Hanphitakphong et al., 2021). Students at universities are just as vulnerable when using smartphones. However, it was discovered that men were more likely than women to use and rely on smartphone apps, such as those for shopping, communication, and health. However, women used to enroll more than men (Szinay et al., 2020).

Findings

The results of this study indicated that there was a significant negative relationship between academic achievement and smartphone addiction. The results were differed between male and female students' smartphone usage, and the male students were more addicted than the female students. Regarding usage habit, the use of smartphone usage of students account for more than 17% between 4:00 p.m.-8:00 p.m., and over 13% between 8:00 p.m.-2:00 a.m. Furthermore, students at private school express higher level than public school in smartphone addiction.

Conclusion

The objective of this study was to investigate the impact of smartphone use on the academic achievement and self-esteem of university students in Punjab, Pakistan. The main results show a large significant negative relationship between smartphone addiction and GPA. Additionally, the comparison between male and female students in their patterns of smartphone use revealed significant differences where male students' addiction was found to be relatively to more use than females. While 17% and 13% of the students had operated smartphones in 4:00–8:00 p.m., and 8:00 p.m.–2:00 a.m., respectively.

Moreover, students from private schools were more likely to have smartphone addiction than their colleagues at public schools. The implications of these findings are profound. This report emphasizes how urgently awareness campaigns on smartphone addiction among Pakistani university students in Punjab are needed. It emphasizes the detrimental impacts on self-esteem and academic performance. They will help parents and teachers have some say over how their children use smartphones. It also generates spaces for age-targeted communication plans and sex-specific strategies. Limitation: The sample included only university students in Punjab, Pakistan, so the findings might not be generalizable to other populations.

Relying on self-reported information, it can be subject to bias or incorrect answers. In addition, causal relationships between smartphone addiction and its consequences cannot be determined because of the cross-sectional study design. In summary, the present study reveals the detrimental influence of smartphone addiction on the academic performance and esteem of university students. The findings call for immediate measures in the form of parental restrictions, educational safeguards and public awareness programmes. To understand this growing issue, additional investigations, preferably longitudinal and involving other regions, are needed.

Recommendations

The research indicates that schools need to provide policies to govern the use of smartphones in the classes and to see that these are enforced. By doing this they will be able to alert the masses by using the media about the negative effects of smart-phone addiction on students' academic achievement. It suggests that seminars and workshops should also be held in universities to sensitize faculty students to the problem. The sample for this study was composed of students of Public colleges in Punjab, Pakistan. Future study can be extended by tapping the universities in other provinces of Pakistan to gain an overall image of the association and find out the regional or disciplinary variability for the outcomes. While this

study focused on the direct relationship between the variables, future studies could consider using moderation or mediation models to explore the topic from new angles and provide deeper insights.

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