THE EFFECT OF SMARTPHONE ADDICTION ON ACADEMIC PERFORMANCE, PERCEIVED STRESS AND SATISFACTION WITH LIFE

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Abstract

Background: The pervasiveness of smartphones has led to an increase in smartphone addiction, raising concerns about its impact on various aspects of individuals' lives.

Objectives: The objectives of this research were to analyze the frequency of smartphone addiction, investigate its male to female ratio, explore its effects on academic performance, mental health indicators, and satisfaction with life, and compare these outcomes between individuals with and without smartphone addiction.

Methodology: This cross-sectional analytical study utilized random sampling to investigate smartphone addiction among 229 university students aged 18 to 25 years from various institutes in Peshawar, Pakistan. Data collection involved validated questionnaires assessing smartphone addiction, perceived stress, and satisfaction with life. Exclusion criteria eliminated non-smartphone users and questionnaires with invalid responses. The collected data were analyzed using SPSS-19, employing Pearson correlation coefficients and hierarchical multiple regression to explore associations between smartphone addiction and related variables.

Results: Out of a total of 229 participants, 99 were men (59.17%) and 130 were girls (64.28%). About 123 (53.7%) of the teenagers were dependent on their phones, with 114 (49.7%) having access to the internet via their handsets. Of them, 64 (52.03%) were female and 59 (47.96%) were male. Addiction to smartphones was also associated with an increase in felt stress (p=0.01) and a decrease in academic performance (-.151, p=0.05). Life happiness was not correlated with gender, age, or any other demographic variable.

Conclusion: Smartphone addiction has negative impact on perceived stress and academic performance while it does not have any effect on an individual's satisfaction with life directly but it may effect it indirectly by raising perceived stress.

Keywords: smartphone, addiction, mental health, academic performance / Grades, satisfaction with life, university going student

Introduction:

Smartphones have become an essential component of our everyday lives in today's hyperconnected environment [1]. These little gadgets fulfill all of our needs with their many uses, including entertainment, productivity, and pleasure [2]. But the pervasiveness of smartphones has sparked worries about their possible negative impacts, especially on perceived stress levels, academic performance, and general life satisfaction [3, 4].

Lately, there has been a lot of interest in the connection between smartphone use and academic achievement [5]. Students often give in to the temptation of their cellphones due to the incessant stream of alerts, social media updates, and addicting applications, which causes distractions and a reduction in concentration on their academics [6]. As a result, this problem has generated discussions among academics, parents, and educators on the influence of smartphone addiction on academic attainment [7, 8].

Smartphone addiction has an impact on people's psychological health in addition to their academic endeavors [9]. High levels of perceived stress are associated with smartphone usage, partly due to the constant urge to be connected and the fear of missing out (FOMO) [10]. One's general quality of life may be compromised by the continual onslaught of information and the pressure to use digital platforms, which may worsen feelings of anxiety and overwhelm [11].

Furthermore, a vicious cycle of discontent and poor self-esteem may be sparked by the attraction of virtual validation and social comparison that are intrinsic to social media platforms [12]. People who constantly look to likes, comments, and followers for affirmation may unintentionally impair their own feeling of satisfaction and fulfillment in real-life events [13]. This study is to explore the impact of smartphone addiction on college students' reported stress levels, life happiness, and academic performance in order to shed light on these urgent issues. This research aims to shed light on the complex dynamics of smartphone addiction and its effects on people's lives by investigating the relationship between use habits of smartphones and a range of psychological and academic consequences.

Research Objective

The objectives of this research were to analyze the frequency of smartphone addiction, investigate its male to female ratio, explore its effects on academic performance, mental health indicators, and satisfaction with life, and compare these outcomes between individuals with and without smartphone addiction.

Material and Methods

Study Design

This study adopted a cross-sectional analytical design employing random sampling techniques. A total of 300 university attending students within the age bracket of 18 to 25 years and regular users of smartphones were included.

Sampling Procedure

The study randomly selected 75 subjects from each of the following institutes: Peshawar Medical & Dental College, Khyber Medical University, University of Peshawar, and University of Engineering & Technology, Peshawar. The sample size was determined based on previous local studies due to the unavailability of prevalence data.

Exclusion Criteria
Participants who did not use smartphones were excluded from the study. Additionally, questionnaires with invalid responses to trap questions were discarded, resulting in a final sample size of 229 subjects.

Data Collection
Data was collected using pre-structured validated questionnaires: Smartphone Addiction Scale - Short Version (SAS-SV), Perceived Stress Scale (PSS), and Satisfaction with Life Scale (SwLS). Subjects were assured of confidentiality and anonymity.

Data Collection Tools
The data collection instrument consisted of four sections: demographics and three different questionnaires. The demographics section included gender, age, year of study, academic major, and a table to assess academic performance. The remaining sections contained SAS-SV, PSS, and SwLS. Smartphone Addiction Scale - Short Version (SAS-SV): Developed by Kwon et al. (2013), SAS-SV consists of 10 items rated on a six-point Likert-type scale. A cutoff value of 31 for boys and 33 for girls was used to identify increased risk. SAS-SV demonstrated strong internal consistency (Cronbach's alpha = 0.91). Perceived Stress Scale (PSS): Developed by Cohen, Kamarck, & Mermelstein (1983), PSS comprises 10 items rated on a five-point Likert-type scale. It measures the perception of stress and has good internal consistency (Cronbach's alpha = 0.79). Satisfaction with Life Scale (SwLS): Developed by Diener, Emmons, Larsen, & Griffin (1985), SwLS assesses subjective well-being with five items rated on a seven-point Likert-type scale. It exhibits strong internal consistency (Cronbach's alpha = 0.87).

Data Analysis
Data analysis was conducted using SPSS-19. Pearson product moment correlation coefficients were calculated to examine associations between smartphone addiction and variables. Preliminary analyses were followed by hierarchical multiple regression to further explore these associations.
Ethical Review Committee of the Prime Foundation
ERC Approval Number: Prime/ERC/2022-21
On the 13th day of April 2022, been granted approval by the Ethical Review Committee of the Prime Foundation for the following study, "The Effect of Smartphone Addiction on Academic Performance, Perceived Stress and Satisfaction with Life".

Results
The prevalence of smartphone addiction among participants depending on gender and internet accessibility is shown in Table 1. Of the 229 participants in total, 123 (53.7%) were found to be addicts and 106 (46.3%) were not. In terms of internet access, 114 (49.7%) addicts and 100 (43.6%) non-addicts had smartphones that could connect to the internet, while 9 (3.9%) addicts and 6 (2.6%) non-addicts lacked such a phone. In terms of gender, 64 (52.03%) of the participants were female, whereas 59 (47.96%) of the male participants were addicts. Furthermore, 66 (62.26%) females and 40 (37.73%) guys were not addicted.

Table 1: Distribution of smartphone addiction based on internet accessibility and gender

Characteristics		Addiction n (%)	Non-Addict n (%)
Internet enabled	Yes	114 (49.7%)	100 (43.6%)
	No	9 (3.9%)	6 (2.6%)
	Total	123 (53.7%)	106(46.2)
Gender	Male	59 (47.96%)	40 (37.73%)
	Female	64 (52.03%)	66 (62.26%)

| Total | 123 (53.71%) | 106 (46.29%) |

Figure 1 illustrates the distribution of smartphone receivers by gender and educational level. Six ladies (2.62%) and thirteen men (5.68%) of the 229 people in the study used smartphones when they were in school. Eighty girls (34.98%) and forty-seven males (20.52%) in the college category and thirty-six females (13.97%) and fifty-one males (22.27%) in the university category respectively got smartphones.
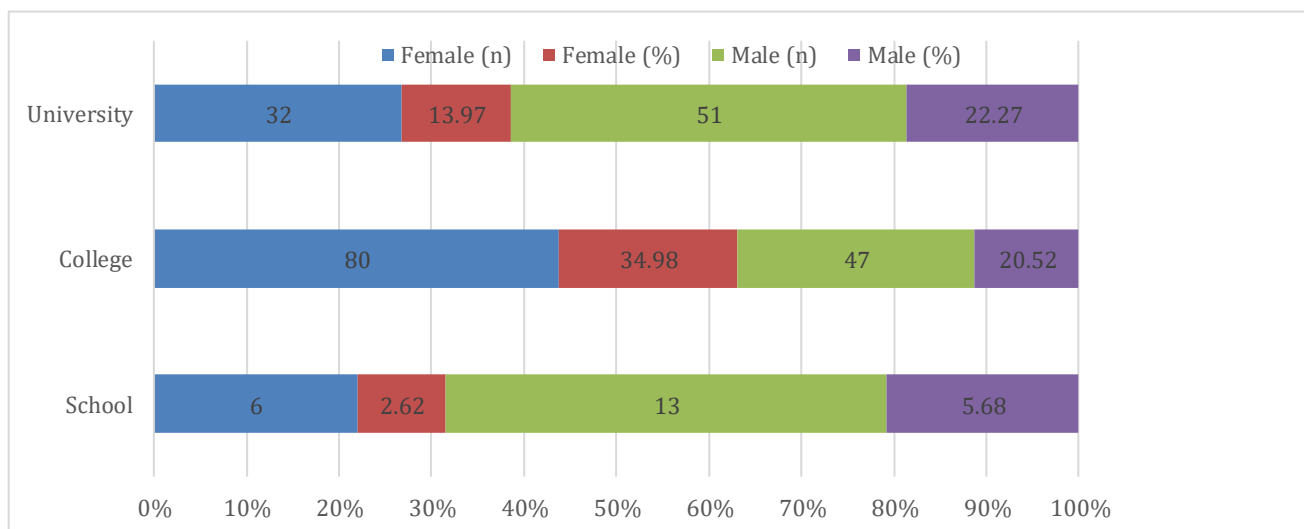

Figure 1: Distribution of smartphone recipients across educational stages and genders

The data highlights the perceived stress levels among respondents, with 21 individuals (9.2%) experiencing low stress, 172 individuals (75.1%) reporting moderate stress, and 36 individuals (15.7%) indicating high stress (figure 2). Additionally, among the highly stressed group, 28 individuals (77.77%) were addicted to their smartphones, with 20 of them (71.42%) being female and 8 (28.57%) were male (figure 3).
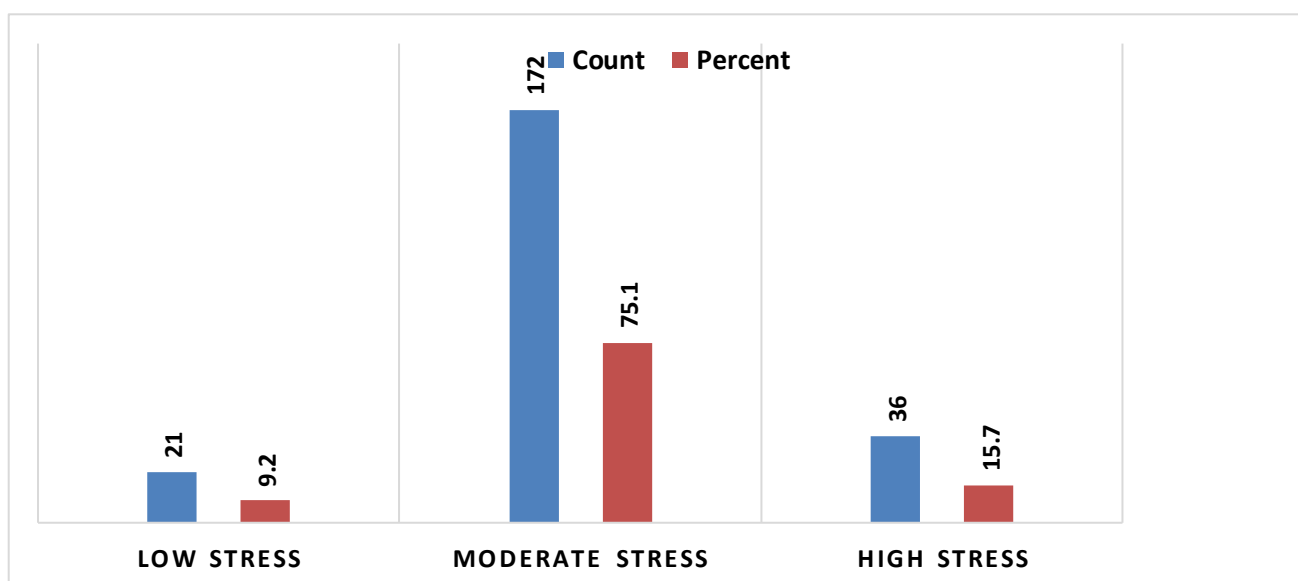

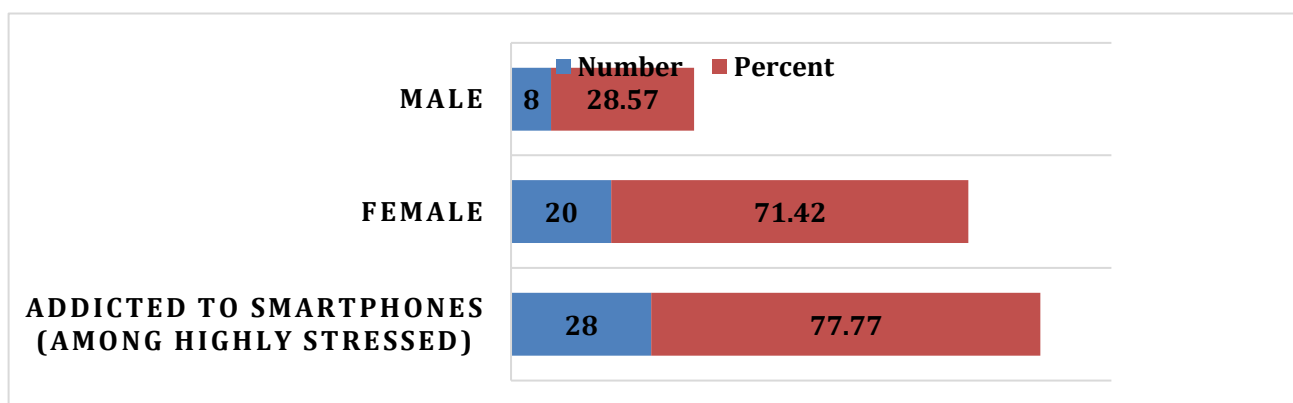**Figure 2: Perceived stress levels among respondents**

Figure 3: Distribution of highly stressed individuals among smartphone addicts

The table 2 presents a cross-tabulation of satisfaction levels and perceived stress scores (PSSCORE) among respondents. Among the total sample of 229 individuals, the majority, constituting 172 (75.10%), reported moderate stress levels, followed by 36 individuals (15.72%) reporting high stress and 21 individuals (9.17%) reporting low stress. Across satisfaction categories, a notable trend emerges: the highest proportion of individuals, totaling 60 (26.20%), reported being slightly satisfied, with 71 individuals (31.00%) expressing satisfaction overall. Conversely, extremely dissatisfied respondents were the least represented group, comprising only 8 individuals (3.49%) overall. These findings suggest a nuanced relationship between satisfaction levels and perceived stress, with a significant portion of respondents reporting moderate stress levels while varying in their satisfaction ratings.

Table 2: Cross-Tabulation of Satisfaction Levels and Perceived Stress Scores (PSSCORE)

Satisfaction	PSSCORE			Total
	Low Stress	Moderate Stress	High Stress	
Extremely Dissatisfied	0(0%)	6 (2.62%)	2 (0.87%)	8 (3.49%)
Dissatisfied	1(0.43%)	10 (4.36%)	8 (3.49%)	19 (8.29%)
Slightly Dissatisfied	3 (1.31%)	24 (10.48%)	8 (3.49%)	35 (15.28%)
Neutral	1 (0.43%)	11 (4.80%)	2 (0.87%)	14 (6.11%)
Slightly Satisfied	4 (1.74%)	47 (20.52%)	9 (3.93%)	60 (26.20%)
Satisfied	9 (3.93%)	58 (25.32%)	4(1.74%)	71 (31.00%)
Extremely Satisfied	3 (1.31%)	16 (6.98%)	3 (1.31%)	22 (9.60%)
Total	21 (9.17%)	172 (75.10%)	36 (15.72%)	229 (100%)

Table 3 illustrates the distribution of perceived stress scores (PSSCORE) among individuals categorized by their addiction status. Among the total sample of 229 individuals, 123 were classified as addicts, with 7 experiencing low stress, 88 reporting moderate stress, and 28 indicating high stress. On the other hand, 106 individuals were categorized as non-addicts, with 14, 84, and 8 reporting low, moderate, and high stress levels, respectively.

Table 3: Distribution of perceived stress scores (PSSCORE) categorized by addiction status

Addiction	PSSCORE			Total
	Low Stress	Moderate Stress	High Stress	
Addict	7	88	28	123
Non-Addict	14	84	8	106
Total	21	172	36	229

Table 4 presents the breakdown of perceived stress scores (PSSCORE) categorized by addiction status and gender. Among addicts, 59 individuals (25.76%) were male, with 7 (3.05%) experiencing low stress, 44 (19.21%) reporting moderate stress, and 8 (3.49%) indicating high stress. Among female addicts, totaling 64 individuals (27.94%), none reported low stress, 44 (19.21%) reported

moderate stress, and 20 (8.73%) reported high stress. For non-addicts, 40 individuals (17.46%) were male, with 8 (3.49%) experiencing low stress, 31 (13.53%) reporting moderate stress, and 1 (0.43%) indicating high stress. Among female non-addicts, totaling 66 individuals (28.82%), 6 (2.62%) reported low stress, 53 (23.14%) reported moderate stress, and 7 (3.05%) reported high stress.

Table 4: Perceived stress scores (PSSCORE) categorized by addiction status and gender

Addiction			PSSCORE			Total
			Low Stress	Moderate Stress	High Stress	
Addict	Gender	Male	7 (3.05%)	44 (19.21%)	8 (3.49%)	59 (25.76%)
		Female	0 (0%)	44 (19.21%)	20 (8.73%)	64 (27.94%)
	Total		7 (3.05%)	88 (38.42%)	28 (12.22%)	123 (53.71%)
Non-Addict	Gender	Male	8 (3.49%)	31 (13.53%)	1 (0.43%)	40 (17.46%)
		Female	6 (2.62%)	53 (23.14%)	7 (3.05%)	66 (28.82%)
	Total		14 (6.11)	84 (36.68%)	8 (3.49%)	106 (46.28%)

Table 5 provides an insightful breakdown of respondents' satisfaction with life. Among the 229 individuals surveyed, 8 individuals (3.5%) expressed being extremely dissatisfied, while 19 individuals (8.3%) reported feeling dissatisfied. A larger proportion, totaling 35 individuals (15.3%), indicated being slightly dissatisfied, with 14 individuals (6.1%) stating a neutral sentiment. Conversely, a considerable portion of respondents, comprising 60 individuals (26.2%), reported feeling slightly satisfied, while 71 individuals (31.0%) expressed satisfaction. Notably, 22 individuals (9.6%) reported being extremely satisfied. The cumulative percentages reflect the progression of satisfaction levels, with each category contributing to the overall distribution of respondents' satisfaction with life.

Table 5: Breakdown of respondents' satisfaction with life

Satisfaction with Life	Frequency	Percent	Valid Percent	Cumulative Percent
Extremely Dissatisfied	8	3.5	3.5	3.5
Dissatisfied	19	8.3	8.3	11.8
Slightly Dissatisfied	35	15.3	15.3	27.1
Neutral	14	6.1	6.1	33.2
Slightly Satisfied	60	26.2	26.2	59.4
Satisfied	71	31.0	31.0	90.4
Extremely Satisfied	22	9.6	9.6	100.0

Table 6 presents a comprehensive overview of satisfaction levels among individuals, categorized by both addiction status and gender. Notably, among addicts, females comprised a slightly higher percentage (52.04%) than males (47.96%). Within this group, satisfaction levels varied, with a substantial portion expressing satisfaction 35.59% of males and 26.56% of females. Conversely, among non-addicts, females constituted a notably larger proportion (62.27%) compared to males (37.73%). Importantly, the majority of both males and females in this category reported satisfaction, with 45.0% of males and 22.72% of females expressing contentment. These values underscore the nuanced relationship between addiction, gender, and satisfaction, highlighting the need for targeted interventions and support systems to address varying levels of well-being within different demographic groups.

Table 6: Satisfaction levels among individuals categorized by addiction status and gender

Addiction			Gender		Total (n ; %)
			Male (n ; %)	Female (n ; %)	
Addict	Satisfaction	Extremely Dissatisfied	1 (1.69%)	3 (4.68%)	4 (3.25%)
		Dissatisfied	3 (5.08%)	9 (14.06%)	12 (9.75%)
		Slightly Dissatisfied	9 (15.25%)	11 (17.18%)	20 (16.26%)
		Neutral	2 (3.38%)	5 (7.81%)	7 (5.69%)

		Slightly Satisfied	16 (27.11%)	15 (23.43%)	31 (25.20%)
		Satisfied	21 (35.59%)	17 (26.56%)	38 (30.89%)
		Extremely Satisfied	7 (11.86%)	4 (6.25%)	11 (8.94%)
		Total	59 (47.96%)	64 (52.04%)	123 (100%)
Non-Addict	Satisfaction	Extremely Dissatisfied	0 (0%)	4 (6.06%)	4 (3.77%)
		Dissatisfied	3 (7.50%)	4 (6.06%)	7 (6.60%)
		Slightly Dissatisfied	4 (10.0%)	11 (16.67%)	15 (14.15%)
		Neutral	2 (5.0%)	5 (7.57%)	7 (6.60%)
		Slightly Satisfied	11 (27.50%)	18 (27.27%)	29 (27.35%)
		Satisfied	18 (45.0%)	15 (22.72%)	33 (31.13%)
		Extremely Satisfied	2 (5.0%)	9 (13.63%)	11 (10.37%)
		Total	40 (37.73%)	66 (62.27%)	106 (100%)

This correlation table 7 explores the relationships between various factors among the surveyed individuals. Noteworthy correlations include a significant negative correlation between age and academic performance (-.151, p = .022), indicating that as age increases, academic performance tends to decrease. Conversely, a positive correlation is observed between academic performance and satisfaction with life (.220, p = .001), suggesting that individuals with better academic performance tend to report higher levels of life satisfaction. Additionally, a significant positive correlation emerges between smartphone addiction score and perceived stress scales (.217, p = .001), indicating that higher smartphone addiction scores are associated with increased perceived stress levels. These correlations provide valuable insights into the interplay between different variables and their potential impact on individuals' experiences and well-being.

Table 7: Correlation table exploring relationships between various factors

Variables		Gender of the subjects	Age of the subject	Academic performance	Smart phone addiction score	Satisfaction with life	Perceived stress Scales
Gender	Pearson Correlation	1	-.151*	.220**	-.106	-.157*	.263**
	Sig. (2-tailed)		.022	.001	.110	.018	.000
	N	229	229	229	229	229	229
Age	Pearson Correlation	-.151*	1	-.310**	.111	.073	.026
	Sig. (2-tailed)	.022		.000	.092	.269	.694
	N	229	229	229	229	229	229
Academic Performance	Pearson Correlation	.220**	-.310**	1	-.151*	-.029	-.030
	Sig. (2-tailed)	.001	.000		.022	.666	.647
	N	229	229	229	229	229	229
Smart phone addiction score	Pearson Correlation	-.106	.111	-.151*	1	-.052	.217**
	Sig. (2-tailed)	.110	.092	.022		.434	.001
	N	229	229	229	229	229	229
Satisfaction with life	Pearson Correlation	-.157*	.073	-.029	-.052	1	-.214**
	Sig. (2-tailed)	.018	.269	.666	.434		.001
	N	229	229	229	229	229	229
Perceived stress Scales	Pearson Correlation	.263**	.026	-.030	.217**	-.214**	1
	Sig. (2-tailed)	.000	.694	.647	.001	.001	
	N	229	229	229	229	229	229

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Discussion:

The aim behind this research was to find out the correlation of smartphone addiction with gender, age, academic performance, perceived stress and satisfaction with life. As smartphone addiction is one of the leading addictions and Internet has been regarded as one of the main cause of Smartphone addiction and both are said to overlap to some extent [14,15]. A study was conducted in Hong Kong on a random sample of 976 respondents with ages ranging from 16 to 24 concluded that 37.9% of them were internet addicts [16]. In their study, Kaye and Johnson (2004) reported that Internet, because of its interactivity, actively involves and engages its users [17]. Mutual utility, pass-time, seeking information, convenience and entertainment are the five main motivations behind internet use [18].

Flow is defined as a state of mind in which a person is completely involved in an action, forget about the time and space, all the while being highly productive [19]. There are two pre-requisites for the achievement of the state of flow a person's ability to perform the task and the task's difficulty. It requires a few minutes of complete and unimpaired attentiveness [20,21]. The visual and acoustic signals of a Smartphone, alerting the user via notifications, disrupt his flow experience [22]. Recent studies state that an individual checks his Smartphone after every 18 minutes and at an average of 60 times every day because of the Fear of Missing Out (FoMO), a newly recognized personality trait, that includes hesitation to miss out on any new information, social media addiction being the feeding cause of it [23,24], which has been shown to cause disturbance in sleep patterns, stress, anxiety and withdrawal symptoms [25] resulting in the destruction of well-being , diminished academic performance, and physical activity [26]. The social behavior and social networking are the mains in causing IUD and not the information learning social-media networks [27].

A positive correlation was found with perceived stress which indicated that with smartphone addiction the level of perceived stress increases. Chassiakos, Radesky, and Christakis has reported a U-shaped curvilinear relationship between the time spent on digital media and risk of depression that rises at the low as well as the high ends of internet use [28]. On the other hand, some recent studies have indicated that medium might not be the cause behind Internet and smartphone addiction but an individual's own cognitive-emotional and behavioral profile [29,30].

It showed that smart phone addiction has negative co-relation with academic performance. Duke E and Montag C. conducted a study in 2017 that consisted of a total 262 subjects to assess the Smartphone addiction and self-rated productivity. The study showed a moderate relationship between the both. A diminished productivity was seen as they spent their time on their phone while working and many of their work hours were lost due to it [31]. A study conducted in Peshawar, Pakistan also reported about 74% students felt anxious and disconnected in the absence of their phone, 10% students spent more than 10hrs on their phones and the use of phone had affected the academic performance, physical and other activities of about 56% of surveyed students [32].

Whereas it doesn't show any correlation with gender, age and satisfaction with life as majority of the population were found satisfied with their lives irrespective of their addiction status. Shin D.C. also reported absence of any direct co-relation between the use of smartphone and satisfaction with life and put forward the idea that smartphone usage has little or no negative impact on the satisfaction with life of the users and it is actually the stress and worsened academic performance, caused due to the problematic use of smartphone, that reduced their satisfaction with life [33].

Limitations

One limitation of this study is its cross-sectional design, which precludes establishing causality between smartphone addiction and its impact on academic performance, mental health, and life satisfaction. Additionally, the reliance on self-reported data may introduce response biases, potentially affecting the accuracy of the findings. Furthermore, the sample, consisting solely of university students from Peshawar, may limit the generalizability of the results to other populations or regions.

Conclusion

This study underscores the detrimental impact of smartphone addiction on individuals' perceived stress levels and academic performance. While no direct correlation was found between smartphone addiction and satisfaction with life, it's evident that addiction indirectly affects satisfaction by exacerbating stress levels. The findings highlight the urgent need for interventions to mitigate smartphone addiction's adverse effects, particularly among college students. Moreover, the study emphasizes the importance of considering individual psychological well-being alongside academic outcomes in addressing the pervasive issue of smartphone addiction.

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