

# Exploring the Relationship between Smartphone Addiction, Quality of Life, and Personality Traits in University Students

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## Abstract

**Objective:** This study aimed to explore the dynamics of the relationship among smartphone addiction, quality of life, and personality characteristics in university students.

**Method:** This correlational and descriptive research was conducted to investigate the relationship between smartphone addiction, quality of life, and personality traits among university students. Using a nonprobability random sampling method, 496 university students were selected. Data collection involved the Student Information Form, Smartphone Addiction Scale, Symptom Checklist (SCL-90-R), Revised Eysenck Personality Questionnaire-Abridged Form (EPQR-A), and the WHO Quality of Life Scale-Short Form (WHOQOL-BREF). Statistical analysis was conducted with SPSS 25.0, utilizing Chi-square tests, independent sample t-tests, and Pearson's correlation analysis.

**Results:** Out of 496 students (average age of 20.52), 59.87% were identified as smartphone addicts based on the Smartphone Addiction Scale-Short Version. A notable difference was found by study year ( $P = 0.009$ ) and socioeconomic status ( $P = 0.003$ ). Participants with smartphone addiction registered higher SCL-90-r scores for conditions like Obsessive Compulsive Disorder, Interpersonal Sensitivity, and Psychoticism. The Eysenck Personality Inventory highlighted that the Psychoticism score was significantly higher in the group with smartphone addiction ( $P = 0.001$ ). A negative correlation between smartphone addiction scores and general health (WHOQoL) was identified, whereas a positive correlation with SCL-90-R's Psychoticism dimension score was observed ( $P < 0.001$ ).

**Conclusion:** Smartphone addiction is widespread among university student population. The study indicates that smartphone addiction not only impacts the individual's quality of life but also is associated with personality disorders, and these problems intensify with the severity of addiction. The findings underscore the need for interventions and educational programs to address smartphone addiction in this population.

**Key words:** *Personality; Quality of Life; Smartphone Addiction; Student; University*

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**S**martphones, progressively influencing our daily lives, have become an essential component of our everyday routine (1, 2). These devices facilitate communication by allowing for sending and receiving messages and making phone calls. They have also induced changes in our daily activities and habits, enabling access to information whenever and wherever needed (1, 3, 4). Especially among university students, smartphones play a pivotal role. These devices are utilized for a multitude of activities, encompassing study, leisure pursuits, internet and social network access, and social communication. The multifaceted nature of this technology profoundly influences our daily existence and social interactions (3, 4). As a result, as one might predict, excessive smartphone usage can lead to notable changes in an individual's quality of life (5). Excessive smartphone use has been described as smartphone addiction by some researchers. While this term remains a topic of debate, it can be defined as smartphone use that is incompatible with normal functioning, or that is excessively or problematically disruptive to individuals' social functions (6, 7). Symptoms such as fixation on smartphone usage, experiencing withdrawal symptoms when the smartphone is not used, or a decline in productivity due to disruptions in daily routines, are considered indications of smartphone addiction (8, 9). The World Health Organization has also reported public health concerns associated with the overuse of smartphones (10).

The vulnerability of adolescents to addiction, owing to their less developed prefrontal cortex compared to adults, has been noted (11). This susceptibility makes smartphone addiction a growing concern that impedes the healthy growth and development of university students in early adulthood (12). This concern becomes especially pertinent when considering the potential long-term implications for this demographic's quality of life and overall well-being. Existing literature reports that smartphone addiction among university students can negatively impact physical and mental health, leading to stress, depression, sleep disorders, reduced academic performance, and strained social relations, ultimately diminishing quality of life (5,13-16). Quality of life is a subjective and complex notion that encompasses satisfaction across physical, emotional, psychosocial, and spiritual aspects of life. As evidenced by studies, smartphone usage plays a significant role in shaping an individual's quality of life (5, 15).

Given the pronounced effects of smartphone addiction, identifying its risk factors becomes crucial. Personality traits are considered among the most significant predictors of addictive behaviors (7, 8). Specifically, neuroticism, agreeableness, extraversion, openness to experience, and conscientiousness, known as the 'Big Five' personality traits, are associated with behavioral addictions. Studies have shown that certain personality

traits, like neuroticism and extraversion, demonstrate a stronger correlation with smartphone addiction (1,17-19).

An individual's personality traits are closely related to their quality of life. For example, neuroticism, a personality trait indicative of emotional stability, peaks especially in late adolescence and gradually diminishes over adulthood. This trait has been shown to negatively correlate with quality of life and can be a predictor of quality-of-life outcomes (21, 22).

Although there exists a considerable amount of literature that details the usage and impact of smartphones, a notable gap persists in our understanding of the intricate relationships among smartphone addiction, specific personality traits, and resulting quality of life. Understanding these dynamics could pave the way for more effective interventions and preventive measures for those at risk. This study aims to investigate the connection between smartphone addiction, quality of life, and personality traits in university students, with the goal of providing new insights to the existing body of literature by specifically addressing these gaps.

## **Materials and Methods**

This research was carried out as a descriptive and correlational research aimed at exploring the link between smartphone addiction, quality of life, and personality traits in university students. The study's population consisted of students (n = 1100) attending the Faculty of Educational Sciences at a state university in the border city of Agri, located in eastern Turkey, during the 2018-2019 academic year. The sample, selected using a nonprobability random sampling method, included 496 students. Selection criteria for the sample were predicated on the students' willingness and voluntary consent to participate in the study.

The research was conducted after obtaining approval from the Ethics Committee of Agri Ibrahim Cecen University (approval date/no: 09.03.2018/18-21). Before collecting the data, the participants were informed by the researcher about the aim of the research and other pertinent details. Verbal consent was obtained from the students who agreed to participate in the study, in accordance with the principle of voluntary participation. The data were collected in areas where students spend their free time at the university, such as the canteen and lounge, outside of class hours.

Data was collected using the Student Information Form to ascertain the students' demographic and individual characteristics, the Smartphone Addiction Scale to assess their smartphone use, the Symptom Checklist (SCL-90-R) to screen for psychopathology, the Revised Eysenck Personality Questionnaire-Abridged Form (EPQR-A) to evaluate personality traits, and the World Health Organization Quality of Life Scale-Short Form (WHOQOL-BREF) to measure their quality of life.

**Student Information Form:** This form was prepared by the researchers in line with pertinent literature (3, 7). It includes questions about the student's age, gender, educational level, income status, and the presence of any physical or psychiatric illnesses. It also inquires about the presence of any psychiatric illnesses in the parents.

**Smartphone Addiction Scale:** This scale was developed by Kwon *et al.* (23) to measure the risk of smartphone addiction in adolescents and was adapted for the Turkish society by Noyan *et al.* (2).

The scale consists of 10 items, each evaluated on a six-point Likert-type scale. Responses vary from "1-Strongly disagree" to "6-Strongly agree", including "2-Disagree", "3-Partly disagree", "4-Partly agree", and "5-Agree". The maximum score attainable on the scale is 60, and the minimum is 10. Higher scores signify a greater risk of addiction. This unidimensional scale has one factor and does not have any subscales. In the original Korean sample, the cut-off values for potential addiction were 31 for men and 33 for women. In this study, the cut-off score for addiction was set at 31 and above. The Cronbach's alpha coefficient for the original form was 0.91, 0.87 in the adaptation study for the Turkish population, and 0.85 in this study.

**Symptom Checklist (SCL-90-R):** The SCL-90-R, a scale typically used to characterize negative reactions induced by stress, was initially developed by Derogatis & Cleary (24) and later adapted for the Turkish society by Dağ (25). The original factor structure of the scale was examined by Kogar using Mokken Scaling Analysis (26). The scale is comprised of 90 items and includes nine dimensions: somatization, obsessive-compulsive, depression, anxiety, phobic anxiety, hostility, interpersonal sensitivity, paranoid ideation, and psychoticism. A general scale score can be obtained from the scale to determine the level of discomfort experienced. The items on this five-point Likert scale are scored from 0 (never) to 4 (extreme). Each statement on the scale comprises a self-report regarding the individual's condition over the past 15 days. In the study conducted by Dağ (25), the Cronbach's alpha coefficient of the scale was reported as 0.97, and it was found to be 0.96 in this study.

**Revised Eysenck Personality Questionnaire-Abridged Form (EPQR-A):** Francis *et al.* revised the Eysenck Personality Questionnaire (EPQ) and its 48-

item short form (EPQ-R) (27) to create a more streamlined questionnaire, known as (EPQR-A) (28). This revised tool evaluates personality across three primary factors: extraversion, neuroticism, and psychoticism. In addition, it includes a 'lying' subscale designed to reduce potential bias during the questionnaire's administration. Each factor includes six items, with responses as either Yes (1) or No (0). The score for each personality trait can range from 0 to 6. The Turkish adaptation of the questionnaire revealed internal consistency coefficients of 0.78, 0.65, 0.42, and 0.64 for the dimensions of extraversion, neuroticism, psychoticism, and lying, respectively (29).

**The World Health Organization Quality of Life Scale-Short Form (WHOQOL-BREF):** WHOQOL-BREF is a truncated version of the WHOQOL-100, a 100-item scale developed by the WHO to measure an individual's well-being (30). The WHOQOL-BREF includes four domains: physical, psychological, social relations, and environmental. This scale does not offer a cumulative score; rather, each section and domain are scored with a maximum of either 20 or 100 points. In the Turkish adaptation of the scale, (31), the Cronbach's alpha internal consistency coefficients were found to be 0.76 for physical quality of life, 0.67 for psychological quality of life, 0.56 for social life quality, and 0.74 for environmental quality of life. In this study, the internal consistency coefficient was determined as 0.81.

**Statistical Analysis**

For the statistical analysis, SPSS 25.0 (IBM, USA) was used. The Kolmogorov-Smirnov test was employed to assess the normality of the data. Chi-square and independent sample t-tests were utilized for comparison purposes. The Pearson test was applied for correlation analysis. A P-value of less than 0.05 was deemed statistically significant.

**Results**

When examining the individual attributes of the participants in the research, it was observed that 255 (51.4%) of the study subjects were male, and 241 (48.6%) were female. The average age of the students was 20.52 ± 1.69, ranging from 17 to 26. The demographic and individual attributes of the participants are outlined in Table 1.

**Table 1. Sociodemographic Characteristics of Participants**

		N	%
Sex (n (%))	Male	255	%51.4
	Female	241	%48.6
Age (Mean ± SD - Min-max)		20.52 ± 1.69	17-26
Class (n (%))	Prep	57	11.5%
	1	116	23.4%

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	2	190	38.3%
	3	91	18.3%
	4	42	8.5%
Economic Level (n (%))	Poor	28	5.6%
	Moderate	317	63.9%
	High	128	25.8%
Physical Disease (n (%))	No	473	95.3%
	Yes	23	4.6%
Psychiatric Disease (n (%))	No	483	97.3%
	Yes	13	2.7%
Psychiatric Disease (Family) (n (%))	No	483	97.3%
	Yes	13	2.7%

The mean score for the participants' SAS-SV was  $32.43 \pm 9.73$ . When the cut-off point for SAS-SV was considered 31, it was found that 297 participants displayed smartphone addiction, accounting for 59.87%

of the research group. The mean scores of the participants' WHOQoL, Scl-90-R- Mental Symptom Screening Test, and Eysenck Personality Inventory are shown in Table 2.

**Table 2. Mean and Standard Deviation of the Symptom Checklist, Revised Eysenck Personality Questionnaire-Abridged Form, World Health Organization Quality of Life Scale-Short Form, Smartphone Addiction Scale-Short Version Scores**

Questionnaires	Mean $\pm$ SD
<b>SAS-SV</b>	32.43 $\pm$ 9.73
<b>WHOQoL</b>	
General Health-Raw Score	6.11 $\pm$ 1.90
General Health-Percentage	51.37 $\pm$ 23.78
Physical Health-Raw Score	22.40 $\pm$ 3.93
Physical Health-Percentage	55.01 $\pm$ 14.04
Psychological Health-Raw Score	18.69 $\pm$ 4.73
Psychological Health-Percentage	52.87 $\pm$ 19.73
Social Relations-Raw Score	8.76 $\pm$ 2.55
Social Relations-Percentage	47.96 $\pm$ 21.26
Environment-Raw Score	24.68 $\pm$ 4.87
Environment- Percentage	52.12 $\pm$ 15.22
<b>SCL-90</b>	
Somatization Score	1.68 $\pm$ 1.24
Obsessive-Compulsive Disorder Score	1.65 $\pm$ 0.61
Interpersonal Sensitivity Score	1.68 $\pm$ 0.68
Depression Score	1.63 $\pm$ 0.68
Anxiety Score	1.89 $\pm$ 0.69
Hostility Score	1.61 $\pm$ 0.77

## Personality Traits in Smartphone Addiction

Phobic Anxiety Score	1.49 ± 0.76
Paranoid Ideation Score	1.62 ± 0.87
Psychoticism Score	1.56 ± 0.87
Additional Scales Score	1.70 ± 0.71
Total	1.62 ± 0.57
<b>EPQR-A</b>	
Extraversion Score	3.42 ± 1.50
Lie Score	3.43 ± 1.43
Neuroticism Score	3.63 ± 1.31
Psychoticism Score	2.51 ± 1.31

SCL-90-R: Symptom Checklist; EPQR-A: Revised Eysenck Personality Questionnaire-Abridged Form; WHOQOL-BREF: World Health Organization Quality of Life Scale-Short Form; SAS-SV: Smartphone Addiction Scale Short Version.

Comparing the individual attributes of participants in the groups with and without smartphone addiction, no statistically significant variation was noted with respect to age and gender. However, a statistically significant

higher level of smartphone addiction was identified among participants in their second year of study ( $P = 0.009$ ) and those of higher socioeconomic status ( $P = 0.003$ ) (Table 3).

**Table 3. Comparison of Sociodemographic Characteristics between Groups with and without Smartphone Addiction**

		Not Addicted	Addicted	P
Gender	Male	99	156	0.279
	Female	100	141	
Class	Prep	34	23	0.009
	1	54	62	
	2	70	120	
	3	32	59	
	4	9	33	
Economic Level	Poor	14	14	0.003*
	Moderate	134	183	
	High	38	89	
Physical Disease	No	175	275	0.286
	Yes	12	11	
Psychiatric Disease	No	181	280	0.381
	Yes	7	6	
Family Psychiatric Disease	No	182	279	0.952
	Yes	5	8	

The significance level is  $P < 0.05$ .

Participants with smartphone addiction had higher mean SAS-SV scores ( $23.03 \pm 5.87$  vs.  $38.71 \pm 6.05$ ;  $P < 0.001$ ), while their WHOQoL-Physical Health-Raw and WHOQoL-Physical Health-Percentage scores were

lower ( $P < 0.001$ ) (Table 4). Furthermore, on the SCL-90-R Mental Symptom Screening Test, scores for Obsessive-Compulsive Disorder, Interpersonal Sensitivity, Depression, Anxiety, Anger-Antagonism,

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Phobic Anxiety, Paranoid Ideation, Psychoticism, Additional Scales, and the Grand Total were statistically

significantly higher in the group exhibiting smartphone addiction (Table 4).

**Table 4. Comparison of Age and Symptom Checklist, Revised Eysenck Personality Questionnaire-Abridged Form, World Health Organization Quality of Life Scale-Short Form, Smartphone Addiction Scale-Short Version Scores between Groups with and without Smartphone Addiction**

	Not Addicted	Addicted	P
<b>Age</b>	20.24 ± 1.67	20.72 ± 1.67	0.493
<b>Smartphone Addiction Scale-Short Version</b>	23.03 ± 5.87	38.71 ± 6.05	< 0.001*
<b>WHOQoL</b>			
General Health-Raw Score	6.29 ± 2.03	6.00 ± 1.81	0.106
General Health-Percentage	53.62 ± 25.31	50.04 ± 22.60	0.115
Physical Health-Raw Score	23.28 ± 4.39	21.86 ± 3.52	< 0.001*
Physical Health-Percentage	58.15 ± 15.69	53.08 ± 12.56	< 0.001*
Psychological Health-Raw Score	19.22 ± 4.16	18.36 ± 5.04	0.055
Psychological Health-Percentage	55.07 ± 17.34	51.54 ± 20.98	0.046
Social Relations-Raw Score	8.77 ± 2.47	8.76 ± 2.60	0.963
Social Relations-Percentage	48.09 ± 20.59	47.99 ± 21.66	0.962
Environment-Raw Score	25.23 ± 5.23	24.36 ± 4.56	0.064
Environment- Percentage	53.84 ± 16.36	51.13 ± 14.26	0.056
<b>SCL-90</b>			
Somatization Score	1.58 ± 1.82	1.75 ± 0.58	0.139
Obsessive-Compulsive Disorder Score	1.51 ± 0.68	1.74 ± 0.54	< 0.001*
Interpersonal Sensitivity Score	1.53 ± 0.76	1.78 ± 0.61	< 0.001*
Depression Score	1.48 ± 0.77	1.73 ± 0.59	< 0.001*
Anxiety Score	1.43 ± 0.78	2.20 ± 1.64	0.002*
Hostility Score	1.46 ± 0.88	1.71 ± 0.68	0.001*
Phobic Anxiety Score	1.32 ± 0.82	1.60 ± 0.69	< 0.001*
Paranoid Ideation Score	1.47 ± 0.81	1.73 ± 0.89	0.001*
Psychoticism Score	1.37 ± 0.81	1.69 ± 0.64	< 0.001*
Additional Scales Score	1.57 ± 0.81	1.79 ± 0.61	< 0.001*
Total Score	1.46 ± 0.68	1.72 ± 0.46	< 0.001*
<b>EPQR-A</b>			
Extraversion Score	3.50 ± 1.53	3.37 ± 1.49	0.341
Lie Score	3.68 ± 1.50	3.27 ± 1.38	0.002*
Neuroticism Score	3.62 ± 1.46	3.63 ± 1.20	0.911
Psychoticism Score	2.26 ± 1.30	2.67 ± 1.30	0.001*

The significance level is  $P < 0.05$ ; SCL-90-R: Symptom Checklist; EPQR-A: Revised Eysenck Personality Questionnaire-Abridged Form; WHOQOL-BREF: World Health Organization Quality of Life Scale-Short Form; SAS-SV: Smartphone Addiction Scale Short Version.

According to the Eysenck Personality Inventory, the score for the Psychoticism subgroup in the group with smartphone addiction was significantly higher compared to the group without addiction ( $2.26 \pm 1.30$  vs.  $2.67 \pm 1.30$ ;  $P = 0.001$ ) (Table 4).

A slight negative correlation was observed between the participants' SAS-SV scores and the scores for the WHOQoL- General Health, Physical Health, and Psychological Health sub-scales (Table 5A). A weak positive correlation was observed between SAS-SV

scores and scores for Obsessive Compulsive Disorder, Interpersonal Sensitivity, Depression, Phobic Anxiety, Anger-Antagonism, Paranoid Thoughts, Psychoticism, Additional Scales, and Grand Total in the SCL-90-R test ( $P$  for each  $< 0.001$ ;  $r = 0.196-0.310$ ) (Table 5B). While there was a weak negative correlation between SAS-SV scores and Eysenck's Lie sub-dimension score ( $P < 0.001$ ;  $r = -0.170$ ), a weak positive correlation was found with Eysenck's Psychoticism dimension score ( $P < 0.001$ ;  $r = 0.169$ ) (Table 5A).

**Table 5A. Correlation between Smartphone Addiction Scale-Short Version Scores and World Health Organization Quality of Life Scale-Short Form Scores**

		WHOQoL- General Health- Raw Score	WHOQoL- General Health- Percentage	WHOQoL- Physical Health-Raw Score	WHOQoL- Physical Health- Percentage	WHOQoL- Psychological Health-Raw Score	WHOQoL- Psychological Health- Percentage	WHOQoL- Social Relations-Raw Score	WHOQoL- Social Relations- Percentage	WHOQoL- Environment- Raw Score	WHOQoL- Environment- Percentage
SAS-SV	r	-0.094*	-0.094*	-0.240**	-0.240**	-0.108*	-0.108*	0.000	0.000	-0.074	-0.074
	P	0.038	0.038	0.000	0.000	0.018	0.018	0.995	0.995	0.105	0.105

\*P level is  $< 0.05$ ; \*\*P level is  $< 0.01$ ; WHOQoL-BREF: World Health Organization Quality of Life Scale-Short Form; SAS-SV: Smartphone Addiction Scale Short Version.

**Table 5B. Correlation between Smartphone Addiction Scale-Short Version Scores and Symptom Checklist Scores**

		Somatization Score	Obsessive- Compulsive Disorder Score	Interpersonal Sensitivity Score	Depression Score	Anxiety Score	Hostility Score	Phobic Anxiety Score	Paranoid Ideation Score	Psychoticism Score	Additional Scales Score	Total Score
SAS-SV	r	0.046	0.276**	0.239**	0.263**	0.086	0.247**	0.225**	0.196**	0.275**	0.236**	0.310**
	P	0.309	0.000	0.000	0.000	0.057	0.000	0.000	0.000	0.000	0.000	0.000

\*P level is  $< 0.05$ ; \*\*P level is  $< 0.01$ ; SCL-90-R: Symptom Checklist; SAS-SV: Smartphone Addiction Scale Short Version.

### Discussion

Smartphones have evolved into a crucial element of everyday life, with almost all adolescents in Western societies owning a smartphone. Consequently, it is not surprising that studies have found that adolescents use their smartphones in ways that can lead to mental health issues, including sleep disorders, depression, difficulties in interpersonal relationships, and even smartphone addiction (32-34).

Although numerous studies have illustrated the link between personality traits and addictive behavior, there is still a demand for additional research focusing on the associations between the Big Five personality traits, problematic smartphone use, and quality of life, particularly among university students.

In this context, this study was designed to examine the relationship between smartphone addiction, quality of life, and personality traits of university students. Based on our findings, a significant number of participants exhibited signs of smartphone addiction.

Review of the literature reveals that the average total scores for SAS-SV have been increasing over the years (23, 35, 36). Consequently, it appears inevitable that the risk of smartphone dependency in young people will rise over time. This finding of the study aligns with the findings of Awasthi *et al.*'s research involving medical school students (5). However, in the studies by Ozcan and Meydan Acimis (37), and Lane, the percentages of student participants classified as smartphone addicts were 34.6% and 38.63%, respectively. In a study utilizing a different Smartphone Addiction Scale,

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problematic smartphone use was identified in 15.1% of student participants (34). This discrepancy may stem from differences in academic departments of study participants and socio-cultural characteristics.

When we examined the characteristics of participants, no notable differences were found in terms of age and gender. However, certain student demographics, such as those in their second year of study and those from specific socioeconomic backgrounds, appeared to be more susceptible to smartphone addiction. The literature suggests that students might allocate more time to leisure pursuits and social networking via smartphones, given their tendency to have more free time compared to other academic periods (5). In the research carried out by Yayan *et al.* and Aljomaa *et al.*, it was determined that students with smartphone addiction generally came from a lower socioeconomic level (38, 39). This finding aligns with the results of Koivusilta's study, which showed that adolescents from lower socioeconomic backgrounds tend to spend more time on their smartphones compared to their counterparts from higher socioeconomic levels (40).

Those exhibiting signs of smartphone addiction in our study also reported declines in certain aspects of quality of life (Table 4). These findings align with those of Kumcagiz (41) and Buctot (42). The literature indicates that problematic smartphone uses and addiction in adolescents correlate with a decline in health-related and overall quality of life. Furthermore, individuals with smartphone addiction often lead a sedentary lifestyle and report low life quality and satisfaction (4, 5, 43). Excessive use of smartphones is also recognized to lead to various health issues, such as headaches, ear issues, memory impairment, fatigue, and musculoskeletal disorders affecting the hands, wrists, and neck (22).

Based on the SCL-90-R Mental Symptom Screening Test, scores for Obsessive Compulsive Disorder,

Interpersonal Sensitivity, Depression, Anxiety, Phobic Anxiety, Paranoid Thoughts, Anger-Antagonism, Psychoticism, Additional Scales, and Grand Total were statistically significantly higher in the group with smartphone addiction (Table 4). Eichenberg *et al.* found that students exhibiting problematic smartphone usage had notably higher levels of depression and anxiety (34). In Jeong *et al.*'s study (44) examining the relationship between excessive internet and smartphone use and personality traits in adolescents, significant associations were found between negative mood states, such as depression and anxiety, and expressions of aggression and anger. Behavioral problems like loneliness and obsessive-compulsive behaviors were also linked to internet addiction (45). Previous studies have suggested that smartphone addiction tends to contribute to a life that's stressful, lonely, and unfulfilling (5, 41, 44). Conversely, adolescents suffering from depression and anxiety might resort to the virtual life offered by smartphones to escape real-life stress (22).

A weak negative correlation was observed between SAS-SV scores and the Eysenck lie sub-dimension score, while a weak positive correlation was found with the Eysenck psychoticism sub-dimension score (Table 5C). According to the Eysenck Personality Inventory, the score for the psychoticism subgroup was significantly greater in the group with smartphone addiction than in the group without addiction (Table 4). This result is consistent with Xiong *et al.*'s (46) findings, where they found a significant positive relationship between smartphone addiction and psychoticism in a meta-analysis. Conversely, Zhang *et al.* (47) did not observe a significant link between psychoticism and smartphone addiction in their study with student participants.

**Table 5C. Correlation between Smartphone Addiction Scale-Short Version Scores and Revised Eysenck Personality Questionnaire-Abridged Form Scores**

		EPQR-A Extraversion Score	EPQR-A Lie Score	EPQR-A Neuroticism Score	EPQR-A Psychoticism Score
SAS-SV	r	-0.020	<b>-0.170**</b>	0.076	<b>0.169**</b>
	P	0.656	<b>0.000</b>	0.096	<b>0.000</b>

\*P level is < 0.05; \*\*P level is < 0.01; EPQR-A: Revised Eysenck Personality Questionnaire-Abridged Form; SAS-SV: Smartphone Addiction Scale Short Version.

The literature suggests that individuals with low socialization levels and high degrees of psychoticism often resort to smartphones as a means to escape from reality, owing to the lack of effective positive coping strategies. This results in higher levels of smartphone usage among these individuals (46). A meta-analysis exploring the Big Five personality traits and internet addiction revealed that impulsive and aggressive personality characteristics, along with extraversion,

neuroticism, and psychoticism, may impact the propensity for internet addiction (48).

Differing from numerous prior studies that have mainly concentrated on the direct link between smartphone addiction and specific psychological symptoms or personality traits, our research provides a holistic perspective by investigating the interaction between smartphone addiction, quality of life, and a variety of personality traits in university students. Moreover, our

study population, university students, represents a particularly vulnerable demographic due to the transitional and often stressful nature of their academic and social lives. This provides valuable insights into the nuances of this group, which might not be captured in studies targeting broader age groups or different populations. Our findings thus fill an important gap in the literature by offering a multi-dimensional perspective on the issue, making it a substantial contribution to ongoing discussions on smartphone addiction and its implications.

### Limitation

Several limitations must be considered when interpreting the results of this study. Firstly, the sample used in this research comprised exclusively of university students, which may restrict the applicability of the findings to a broader population. Incorporating participants from different age groups and diverse demographic characteristics in a larger and more representative sample would enhance the external validity of the findings.

Secondly, the measurement tools used in this research relied on self-reporting, which can be subject to participants' subjective perceptions and biases. Self-report measures may not always precisely reflect the true extent of smartphone addiction, personality traits, and quality of life. The use of objective measures or additional assessment methods, such as behavioral observations or clinician-rated assessments, could offer a more thorough insight into these concepts.

Furthermore, the correlational design employed in this study prevents us from establishing causal relationships among smartphone addiction, personality traits, and quality of life. Other variables and factors, such as social support, coping strategies, and environmental influences, may also contribute to these associations. Future research utilizing longitudinal or experimental designs would provide a stronger basis for causal inferences.

Additionally, the retrospective nature of this study introduces the possibility of recall bias and limits our ability to determine temporal relationships. Prospective studies that follow participants over time would provide a more robust understanding of the dynamic nature of smartphone addiction and its impact on personality traits and quality of life.

Lastly, the study did not account for the influence of potential confounding factors. Factors such as socioeconomic status, academic performance, and mental health history could potentially influence the relationships observed in this study. Future research should consider controlling for these variables to obtain a clearer understanding of the unique contributions of smartphone addiction and personality traits to quality-of-life outcomes.

### Conclusion

To conclude, the objective of this study was to investigate the relationship between smartphone addiction, quality of life, and personality traits in university students. The findings indicate that a significant proportion of participants exhibited smartphone addiction, highlighting the increasing risk of addiction among adolescents over time. Certain factors such as being in the second year of study and having a high socioeconomic level were associated with a higher likelihood of smartphone addiction.

The findings further indicated that individuals with smartphone addiction had a diminished quality of life, especially concerning physical health. They demonstrated elevated mental symptoms, such as obsessive-compulsive disorder, interpersonal sensitivity, depression, anxiety, anger-antagonism, phobic anxiety, paranoid ideation, and psychoticism. These results align with prior research that associates problematic smartphone usage with reductions in health-related and overall quality of life, alongside increased levels of depression and anxiety.

Furthermore, a weak negative correlation was found between smartphone addiction scores and the Eysenck lie sub-dimension, along with a weak positive correlation with the Eysenck psychoticism sub-dimension. Individuals exhibiting smartphone addiction demonstrated notably higher scores in the psychoticism subgroup, suggesting a potential association between psychoticism and smartphone addiction. However, these results are not universally consistent across studies.

Overall, the results underscore the importance of continued research into the relationship between personality traits, problematic smartphone use, and quality of life, especially in the context of university students. Comprehending these relationships is crucial for formulating preventive and intervention strategies to tackle the escalating problem of smartphone addiction and its effects on mental health and overall well-being.

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### Conflict of Interest

None.

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