

ADDICTA

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ORIGINAL ARTICLE

Sociodemographic, Clinical, and Psychological Characteristics of Adults with Gaming Disorder: A Nationwide Study from Türkiye

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Main Points

- This study presents the first nationwide profile of adults in Türkiye seeking treatment for internet gaming disorder.
- Participants were predominantly young, single males, with problematic gaming behaviors typically emerging during adolescence.
- Strategy and war games were the most commonly reported genres among individuals with internet gaming disorder.
- Distinct sociodemographic and clinical patterns, including early initiation of gaming and co-occurring psychopathology, were identified among those experiencing internet gaming disorder.
- The findings highlight the need for early prevention strategies and tailored interventions addressing the specific risk profiles of individuals affected by internet gaming disorder.

Abstract

Internet gaming disorder, recognized in the 11th version of the International Classification of Diseases alongside gambling disorder, is characterized by excessive gaming salience, impaired control, and functional impairment. With increasing prevalence worldwide and in Türkiye, identifying the sociodemographic and psychological features of adults with internet gaming disorder is crucial for prevention and intervention. This retrospective study analyzed data from 250 adults (18 – 66 years) seeking treatment at Green Crescent Counseling Centers in Türkiye between 2020 and 2024. Validated measures included the Sociodemographic and Clinical Information Form, Internet Gaming Disorder Scale – Short Form, Addiction Profile Index – Clinical Form, and Internet Addiction Short Form. Analyses comprised descriptive statistics, chi-square tests, *t*-tests, Mann – Whitney *U*-test, and logistic regression. Results showed that most participants were male (91.2%), mean age 24.2; 89.2% were single, and 68% were 18 – 24 years. Mean onset of gaming was 12.6 years, with problematic patterns at 17. Strategy (46%) and war games (43.2%) predominated. Overall, 23.2% scored high risk (Internet Gaming Disorder Scale – Short Form ≥ 36), with higher depression, anxiety, sensation-seeking, and lower assertiveness ($p < .05$). Predictors of high risk included male gender, marital status, primary gaming use, higher anxiety, sensation-seeking, and lack of assertiveness. Findings indicate internet gaming disorder is prevalent among Turkish adults, paralleling youth trends, and underscore the need for targeted prevention and integrated treatment approaches.

Keywords: Adult, epidemiology, help-seeking behavior, internet gaming disorder, psychopathology, video games

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Introduction

Problematic gaming behavior, along with problematic gambling behavior, has been officially defined for the first time in the 11th version of the World Health Organization's International Classification of Diseases (ICD-11) under the category of disorders related to addictive behaviors. Although the classification of gaming behavior remains a subject of debate, the most recent version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) also recommends further research to establish clear diagnostic criteria (Kim et al., 2022). When examining the manifestations of problematic gaming behavior in daily life, it is observed that gaming behavior becomes increasingly central, control is lost, and negative consequences arise that adversely affect individuals' vital functioning (WHO, 2025). The clinical diagnosis of problematic gaming behavior requires the development of treatment options for this condition (Zajac et al., 2017). Green Crescent Counseling Center, which plays an active role in the psychosocial recovery of addictions in Türkiye, provides free rehabilitation support for both individuals and families in the treatment of problematic gaming behavior through clinical psychologists and social service specialists (Bilge, 2025).

When examining the global prevalence of problematic gaming behavior, a meta-analysis found it to be 3.3%, but it was reported as 8.6% among adolescents (Stevens et al., 2021). In Türkiye, problematic gaming behavior has also become a public health issue, with a prevalence rate of approximately 22.4% among adolescents (Özcan & Kurt, 2023). Considering the prevalence rates worldwide and in Türkiye, it can be said that problematic gaming behavior is a serious risk factor, especially during adolescence, and therefore the need for preventive and rehabilitative studies is increasing. As reported in a recent meta-analysis, the prevalence of gaming disorder shows considerable variability across populations and measurement methods, with marked differences between adolescents, young adults, and genders (Kim et al., 2022). These findings underscore the importance of examining sociodemographic and psychological correlates of gaming disorder in diverse cultural contexts.

It has been observed that problematic gaming behavior is associated with individuals' sociodemographic characteristics. For example, studies have shown that problematic gaming behavior is related to age, with problematic gaming behavior being more prevalent among adolescents (Stevens et al., 2021). Przybylski et al. (2017) shared the results of their research that the frequency and duration of gaming are highest in the 12 – 24 age range. At the same time, it was found that gender is also a determining factor, with males exhibiting riskier gaming behavior than females (Aksu et al., 2022). It was concluded that marital status is a protective factor in problematic gaming behavior, with single individuals being in a higher risk group (Schou Andreassen et al., 2016).

A study conducted in India found that 10.6% of 13- to 19-year-olds exhibited problematic gaming behavior, with males making up the majority of this group (Singh et al., 2021). Razum reported in his 2025 study in Croatia that players of strategy and sports games were more prevalent than gamers overall. A study from the United States indicated that individuals who play strategy

games are at a higher risk of developing problematic gaming behavior (Eichenbaum et al., 2015). Additionally, a study from China showed that problematic gaming behavior varies by age, gender, and game type, with strategy games being a particularly influential factor (Wang et al., 2023).

The prevalence of problematic gaming behavior in conjunction with other mental health conditions recognized in both the DSM and ICD is noteworthy. The most frequently reported comorbidities include anxiety (92%), depression (89%), attention-deficit/hyperactivity disorder (85%), and social skills impairments (75%). In addition, behavioral disorders and anger management difficulties are commonly observed (Falcione & Weber, 2025). Consistent with these findings, Coutelle and colleagues (2024) reported that individuals with problematic gaming behavior often present with ADHD, depression, and anxiety, along with marked difficulties in impulsivity and emotion regulation. At this point, the study by Young and Brand (2017) provides a comprehensive overview by integrating theoretical models and therapeutic approaches in the context of internet gaming disorder (IGD), illustrating how intervention strategies for affected individuals can be shaped.

Although clinically recognized, various treatment approaches have been developed for problematic gaming behavior. The first of these is Cognitive Behavioral Therapy, and a study involving 143 participants found that the treatment, applied over 3 months, had a positive effect on gaming behavior (Wölfling et al., 2019). Additionally, a meta-analysis found that studies incorporating family therapy alongside individual work showed greater effectiveness in the recovery process, with more positive outcomes in both reducing gaming time and associated mental health issues (Kim et al., 2022). All these findings suggest that psychosocial interventions lasting at least 3 months can produce clinically meaningful effects in treating problematic gaming behavior.

In this context, the present study aims to investigate the sociodemographic, clinical, and psychological characteristics of adults who sought treatment for IGD, using nationwide data from Green Crescent Counseling Center across Türkiye. Among these variables, fundamental sociodemographic factors such as gender and age, as well as the clinical characteristics of the sample in the context of IGD, were examined in detail. From this perspective, the originality of the present study lies in addressing these variables concurrently, which have been scarcely examined together in the existing national and international literature. In summary, the present study integrates theoretical frameworks with empirical evidence to provide a comprehensive understanding of IGD. By systematically examining internet use patterns, gaming duration, daily functioning, and co-occurring mental health conditions in a nationally representative sample of adults, it generates novel insights. Moreover, the assessment of changes over a 3-month follow-up period further substantiates its contribution. Collectively, these findings not only enhance the scientific understanding of IGD but also offer a robust foundation to inform future research and intervention strategies.

Material and Methods

This retrospective study examined data from individuals who applied to Green Crescent Counseling Center across Türkiye between 2020 and 2024 due to IGD. During this period, a total

of 304 individuals aged 18 and above applied for this reason. Of these, 250 individuals who completed the assessment form sufficiently for statistical analysis were included in the study.

Participants were eligible if they: (a) were aged 18 years or older, (b) had met the proposed DSM-5 criteria for IGD, and (c) provided informed consent for their data to be used for research purposes. Exclusion criteria were: (a) application for addictions other than gaming (e.g., alcohol, substance, or tobacco), (b) being under the age of 18, or (c) incomplete forms with missing data, particularly when more than one scale or essential demographic information was left blank.

Based on these criteria, all eligible individuals who applied during the study period were included using a consecutive sampling approach (Teddlie & Yu, 2007). The final sample size reflected the total number of participants meeting the inclusion criteria within the data collection period, in line with recommendations for clinical research sampling (Suresh & Chandrashekhara, 2012).

Procedure

Green Crescent Counseling Center provides free, outpatient psychosocial counseling services to individuals and their families who seek support for addictions such as alcohol, substance use, gambling, internet use, and tobacco. These services are delivered in a structured and systematic manner across 105 centers located throughout Türkiye and the Turkish Republic of Northern Cyprus. The data used in this study were obtained during face-to-face assessment sessions conducted by clinical psychologists with individuals who applied specifically due to problematic gaming behavior.

Data Collection Tools

Informed Consent Form

Before the assessment session, participants were informed that their data could be used for research purposes, that their identity would remain confidential, and that personal information would not be shared. Written consent was obtained accordingly.

Sociodemographic and Clinical Information Form

This form was used to collect information on participants' sociodemographic and clinical characteristics. The form addressed variables such as age, gender, marital and educational status, perceived economic conditions, and quality of family relationships. It further included items on daily routines, including availability of leisure time, as well as internet-related behaviors such as primary purposes of use, average daily duration, and preferred activities. For statistical analyses, several variables were consolidated into broader categories to enhance interpretability; for example, responses of "very good" and "good" for perceived economic status were coded as "good."

Internet Gaming Disorder Scale – Short Form

Internet Gaming Disorder Scale – Short Form (IGDS9-SF), developed by Pontes and Griffiths (2015), was used to evaluate gaming behaviors over the past year in line with DSM-5 criteria. The scale includes nine items rated on a five-point Likert scale (1 = never, 5 = very often), producing a total score between 9 and 45. Higher scores reflect greater risk of problematic gaming. Sample items, such as "I think about playing games all day long" or "I

continue playing despite knowing it causes problems," capture the preoccupation and persistence typical of GD.

The IGDS9-SF has been adapted and used in many countries, and its validity has been tested across different cultural contexts. The Turkish validity and reliability study was conducted by Arıca et al. (2018), reporting a Cronbach's alpha coefficient of 0.82, indicating good internal consistency. Higher scores may be associated with impairments in psychosocial functioning due to gaming behavior. In this study, participants scoring 36 or above were categorized as being in the high-risk group, while those scoring below 36 were categorized as low-risk.

Addiction Profile Index-Internet Addiction Short Form

The Addiction Profile Index-Internet Addiction Short Form is a two-question screening form of a scale measuring internet addiction. It questions the duration of internet use and whether internet use causes problems in a person's life. The scale is a 5-point Likert-type scale with a cutoff point of 3.5. The scale's Cronbach's alpha score is 0.88 (Ögel et al., 2012).

Addiction Profile Index – Clinical Form

The Addiction Profile Index – Clinical Form (API-C) is a 21-item self-report scale developed by Ögel et al. (2015) to assess psychological risk factors associated with addiction. Each item is rated on a 5-point Likert scale (1 = never, 5 = always). The scale evaluates six psychological dimensions related to addiction: depression, anxiety, difficulty in anger control, lack of assertiveness, impulsivity, and sensation-seeking behavior.

Each subscale is assessed through items that reflect specific psychological traits. For example, anger control difficulties are evaluated with items such as "I have outbursts of anger that I cannot control." Lack of assertiveness is assessed through statements like "I put others' needs ahead of my own," indicating a tendency to prioritize others at the expense of one's own needs. Impulsivity is measured with items such as "I find it hard to wait to get what I want." The depression dimension includes statements like "In the past year, I felt hopeless when I thought about the future," and anxiety is assessed through items such as "In the past year, I felt restless and uneasy." Sensation-seeking is also assessed with items like "I enjoy doing exciting or fun things, even if they are inappropriate or dangerous."

Higher scores on these dimensions indicate a greater level of risk in the respective area. The internal consistency of the API-C is considered high, with a reported Cronbach's alpha coefficient of 0.81. This suggests that the scale is a psychometrically reliable tool for assessing addiction-related psychological risk factors.

Ethical Consideration

The study received approval from the relevant institutional ethics committee (Date: July 9, 2025; meeting no.: 2025/338).

Data Analysis

The data were analyzed using the SPSS version 29.0 (IBM SPSS Corp.; Armonk, NY, USA) statistical software package. Descriptive statistics were calculated: mean, standard deviation, median, minimum, and maximum for continuous variables, and frequencies and percentages for categorical variables. The normality of the distribution of quantitative data was assessed using the Shapiro – Wilk test and Box Plot visualizations.

Group comparisons were conducted with chi-square, Fisher’s exact, or Fisher – Freeman – Halton tests for categorical variables, and independent-samples *t*-tests or Mann – Whitney *U*-tests for continuous variables, depending on distributional assumptions. For further analysis, binary logistic regression was performed.

A significance level of $p < .05$ was considered statistically significant, and all results were reported with 95% CIs. Effect sizes were evaluated using Cohen’s *d* for parametric tests, effect size *r* for non-parametric tests, and odds ratios for categorical variables.

Results

Among individuals seeking treatment at Green Crescent Counseling Center for IGD, the proportion of male participants was consistently higher across all years. However, in recent years, a relative increase in female applications has been observed (see Figure 1).

The majority of participants were male (91.2%). The mean age was 24.2 years, with 68% aged between 18 and 24 years, and the overall age range of participants was 18 – 66 years. Most participants were single (89.2%), and 58.8% had completed secondary education (see Table 1).

The clinical and internet use characteristics of the participants are presented in Table 2. Of the participants, 67.6% had a history of psychiatric or psychological treatment, and 69.6% reported spending most of the day in leisure time. The mean age at first internet use was 11.5 years, the mean age at first gaming was 12.6 years, and the mean age at onset of problematic gaming behaviors was 17.0 years. Internet use was primarily for playing computer games (75.6%), and 76.4% reported using the internet, computer, or smartphone for 6 hours or more per day in the past 6 months. A total of 40.8% stated that this level of use had a very

high impact on their lives. The most frequently preferred game types were strategy games (46.0%) and war games (43.2%).

The mean Internet Gaming Disorder Scale – Short Form (IGDS-SF) score was 27.7, with 23.2% of participants classified as high risk (≥ 36 points). The mean API-C subscale scores were as follows: depression, 3.50; anxiety, 1.64; anger control problems, 2.24; sensation-seeking behavior, 1.66; lack of assertiveness, 4.88; and impulsivity, 3.20 (see Table 3).

As shown in Table 4, the proportion of participants classified as high risk for internet GD was significantly higher among those who reported using the internet primarily for playing computer games or for social media/sharing sites ($p < .01$). Similarly, the high-risk proportion was greater among those who stated that internet use had a very high impact on their lives ($p < .01$). Participants in the high-risk group had significantly higher mean scores for depression, anxiety, sensation-seeking behavior, and lack of assertiveness compared to those in the low-risk group ($p < .05$).

Multicollinearity among the independent variables was assessed using VIF and Tolerance values. For all variables, VIF values were below 5 and Tolerance values were above 0.1, indicating no multicollinearity problem in the model. The overall model fit was evaluated using the -2 Log Likelihood (177.42), Cox & Snell R^2 (.29), and Nagelkerke R^2 (.43) indices. The Hosmer – Lemeshow goodness-of-fit test was found to be non-significant ($\chi^2 = 3.75, p = .88, p > .05$), suggesting that the model fits the observed data well. The classification accuracy of the model was calculated as 81.4%.

Variables with significant or near-significant associations in the bivariate analysis ($p < .200$) were included in the logistic regression model, with high-risk status on the IGDS-SF (≥ 36 points) as the dependent variable. As shown in Table 5, males had 7.384

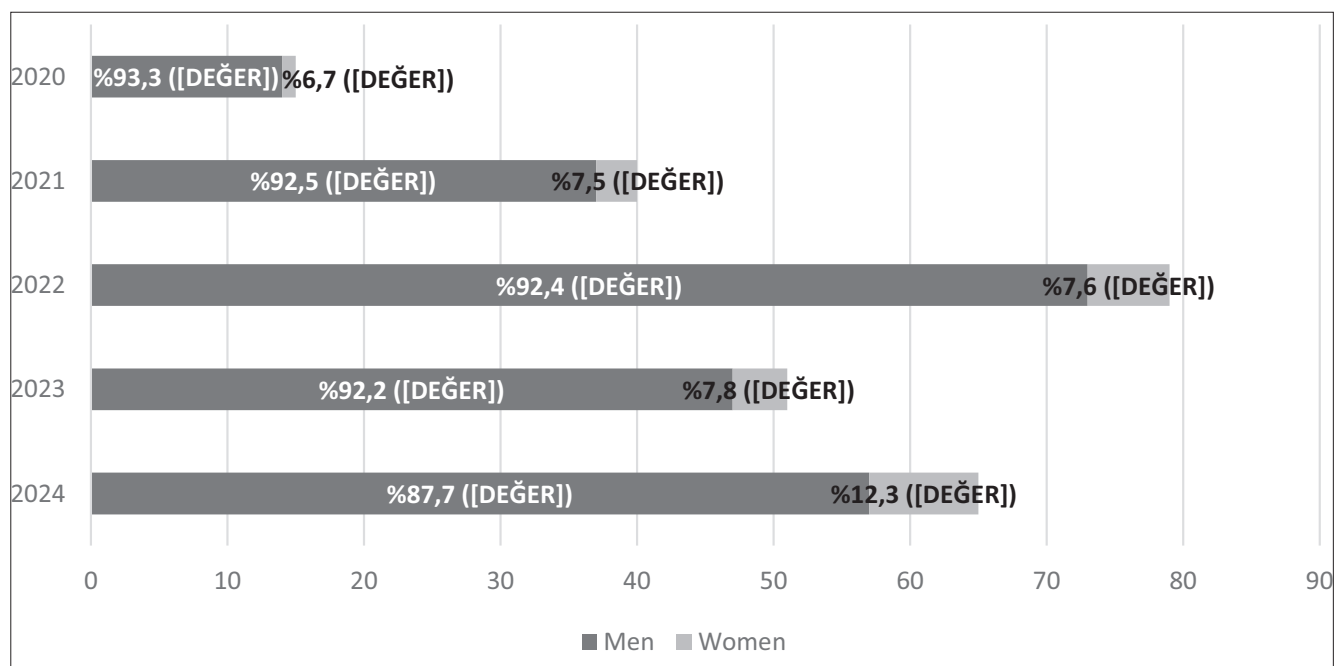


Figure 1. Gender distribution of individuals applying to Green Crescent counselling center for gaming disorder treatment

Table 1.
Sociodemographic and Descriptive Characteristics of the Participants

		N	(%)
Gender	Male	228	91.2
	Female	22	8.8
Age (years)	Mean ± SD	24.23 ± 7.49	
	18 – 24	170	68.0
	25 – 39	65	26.0
	≥40	15	6.0
Marital status	Married	27	10.8
	Single	223	89.2
Education	Primary or less	6	2.4
	Secondary education	147	58.8
	Higher education	66	26.4
	Currently in education	31	12.4
Dysfunctional relationship with mother	No	225	90.0
	Yes	20	8.0
	No mother	5	2.0
Dysfunctional relationship with father	No	188	75.2
	Yes	42	16.8
	No father	20	8.0
Dysfunctional relationship with spouse (married only, N = 27)	No	21	77.8
	Yes	6	22.2
Perceived economic situation	Good	98	39.2
	Moderate	128	51.2
	Poor	24	9.6

Note: N = Sample size; SD = Standard deviation.

times higher odds of being in the high-risk group compared to females (95% CI: 1.319 – 41.349; $p < .05$). Compared to single participants, married participants had 3.713 times higher odds (95% CI: 1.095 – 12.583; $p < .05$). Using the internet primarily for playing computer games, compared to using it for social media/sharing sites, was associated with 4.868 times higher odds of being in the high-risk group (95% CI: 1.375 – 17.236; $p < .05$). A one-point increase in anxiety score was associated with 1.399 times higher odds (95% CI: 1.027 – 1.905), a one-point increase in sensation-seeking behavior score with 1.716 times higher odds (95% CI: 1.336 – 2.206), and a one-point increase in lack of assertiveness score with 1.233 times higher odds of high-risk status (95% CI: 1.045 – 1.455).

Figure 2 presents the self-reported daily game playing durations of participants at the initial assessment and at the 3-month follow-up session. The data reflect participants’ reports of their game playing time on the day of each session. At the initial assessment, 76% of participants reported playing for more than 6 hours per day; by the 3-month follow-up, this proportion had decreased to 13%. Although the overall trend indicated a reduction, individual patterns varied, with some participants reporting increases while others showed decreases over time. During the same period, the

proportion reporting no internet use increased from 0% at the initial assessment to 66% at the 3-month follow-up.

Discussion

This nationwide study examined the sociodemographic, clinical, and psychological characteristics of adults who sought treatment for gaming disorder at Green Crescent Counseling Center across Türkiye, along with their internet use patterns, gaming duration, and the associated impact on daily functioning. This is the first study to examine the characteristics of gaming disorder in an adult clinical population in Türkiye. The key findings suggest that sociodemographic characteristics, psychological factors, and game-related features may be associated with the process of developing gaming disorder.

According to developmental stage classifications, it was found that the average age of first gaming corresponded to early adolescence, whereas problematic use emerged during mid-adolescence. Starting to play games regularly at an earlier age has been associated with an increased risk of later gaming disorder (Nakayama et al., 2020). During this period, when brain development is still ongoing, early initiation may pose an additional risk for the emergence of addictive behaviors.

Table 2.
Clinical and Internet Use Characteristics of the Participants

		N	(%)
History of psychiatric or psychological treatment (excluding GD)	No	81	32.4
	Yes	169	67.6
Amount of leisure time	Never/Rarely	16	6.4
	Sometimes	60	24.0
	Most of the day / Almost all day	174	69.6
Age at first internet use (years)	Mean \pm SD	11.50 \pm 6.51	
Age at first gaming (years)	Mean \pm SD	12.57 \pm 7.19	
Age at onset of problematic gaming (years)	Mean \pm SD	17.13 \pm 7.38	
Main purpose of internet use	Homework/Work/Sending an email	6	2.4
	Computer game	189	75.6
	Talking with friends	9	3.6
	Social media sharing sites	38	15.2
	Listening to music	8	3.2
Daily internet/computer/smartphone use in the past 6 months	Does not use at all	0	0.0
	1 – 5 times a week or less	1	0.4
	0 – 3 hours per day	6	2.4
	4 – 5 hours per day	52	20.8
	6 hours or more per day	191	76.4
Perceived impact of internet/computer/smartphone use on daily life	Not at all	15	6.0
	Very little	9	3.6
	Somewhat	44	17.6
	Much	80	32.0
	Very much	102	40.8
Preferred game type	Board and card games (chess, checkers, backgammon, etc.)	13	5.2
	Sports games (football, basketball)	9	3.6
	Racing games (car, motorcycle)	5	2.0
	Strategy games (family, city-building)	115	46.0
	War games	108	43.2

Note: GD = Gaming disorder; N = Sample size SD = Standard deviation.

In the 2020 – 2024 data, the number of people seeking treatment at the Green Crescent Counseling Center increased in some years, while it decreased in others. Changes in the number of applications should be evaluated in conjunction with period-specific circumstances and the broader social context. However, there has been a consistent upward trend in the proportion of women seeking treatment each year. This trend appears to align with the growing representation of female players within the gaming population (King & Potenza, 2020).

While men were observed to be at higher risk based on treatment applications, no significant overall difference was found between genders. The age range of participants in this study was between 18 and 66 years, with a mean age of 24.23. Similar mean ages have been reported among individuals seeking treatment for IGD, with Granero et al. (2022) documenting a mean of 24.7 years. The age of onset of gaming and the age at which problematic gaming began did not differ significantly between the low-risk and high-risk groups. This suggests that the age of onset of gaming alone

Table 3.
Gaming Disorder and Psychological Characteristics

	Mean \pm SD
Internet Gaming Disorder Scale - Short Form	27.73 \pm 8.53
Low risk (<36 score)	192 (76.8%)
High risk (\geq 36 score)	58 (23.2%)
API-C	
Depression	3.50 \pm 2.02
Anxiety	1.64 \pm 1.40
Anger control problem	2.24 \pm 1.55
Sensation-seeking behavior	1.66 \pm 1.63
Lack of assertiveness	4.88 \pm 2.66
Impulsivity	3.20 \pm 1.65

Note: API-C = Addiction Profile Index – Clinical Form; GD = Gaming disorder; IGDS-SF = Internet Gaming Disorder Scale – Short Form; SD = Standard deviation.

Table 4.
Comparison by Risk Categories of the Internet Gaming Disorder Scale

		IGDS-SF		<i>p</i>	Effect Size (Odds Ratio/ Cohen's <i>d</i> / <i>r</i>)
		Low Risk (<36 Points) (<i>n</i> = 192)	High Risk (≥ 36 Points) (<i>n</i> = 58)		
		<i>n</i> (%)	<i>n</i> (%)		
Gender	Male	172 (75.4)	56 (24.6)	€.101	-
	Female	20 (90.9)	2 (9.1)		
Age (years)	Mean \pm SD	24.02 \pm 7.46	24.95 \pm 7.59	™.267	-
Education	Primary or less	5 (83.3)	1 (16.7)	†.815	-
	Secondary education	115 (78.2)	32 (21.8)		
	Higher education	50 (75.8)	16 (24.2)		
	Currently in education	22 (71.0)	9 (29.0)		
Marital status	Married	17 (63.0)	10 (37.0)	€.071	-
	Single	175 (78.5)	48 (21.5)		
Dysfunctional relationship with mother (<i>n</i> = 245)	No	176 (78.2)	49 (21.8)	€.406	-
	Yes	14 (70.0)	6 (30.0)		
Dysfunctional relationship with father (<i>n</i> = 230)	No	147 (78.2)	41 (21.8)	€.778	-
	Yes	32 (76.2)	10 (23.8)		
Dysfunctional relationship with spouse (married only, <i>N</i> = 27)	No	13 (61.9)	8 (38.1)	€1.000	-
	Yes	4 (66.7)	2 (33.3)		
Perceived economic status	Good	73 (74.5)	25 (25.5)	€.504	-
	Moderate	102 (79.7)	26 (20.3)		
	Poor	17 (70.8)	7 (29.2)		
History of psychiatric or psychological treatment (excluding GD)	No	62 (76.5)	19 (23.5)	€.947	-
	Yes	130 (76.9)	39 (23.1)		
Amount of leisure time	Never/Rarely	12 (75.0)	4 (25.0)	†.115	-
	Sometimes	52 (86.7)	8 (13.3)		
	Most of the day /Almost all day	128 (73.6)	46 (26.4)		
Age at first internet use (years)	Mean \pm SD	11.58 \pm 6.71	11.24 \pm 5.82	§.726	-
Age at first gaming (years)	Mean \pm SD	12.63 \pm 7.20	12.38 \pm 7.21	§.816	-
Age at onset of problematic gaming (years)	Mean \pm SD	17.31 \pm 7.34	16.53 \pm 7.52	§.483	-
Main purpose of internet use	Homework/Work / Sending an email	6 (100)	0 (0.0)	†.009**	OR = 0.762
	Computer Game	135 (71.4)	54 (28.6)		OR = 5.700
	Talking with Friends	9 (100)	0 (0.0)		OR = 0.759
	Social media-Sharing Sites	34 (89.5)	4 (10.5)		OR = 0.344
	Listening to music	8 (100)	0 (0.0)		OR = 0.760
Daily internet/ computer/ smartphone use in the past 6 months	1 – 5 times a week or less	1 (100)	0 (0.0)	†.050	-
	0 – 3 hours per day	6 (100)	0 (0.0)		
	4 – 5 hours per day	46 (88.5)	6 (11.5)		
	6 hours or more per day	139 (72.8)	52 (27.2)		

(Continued)

Table 4.
Comparison by Risk Categories of the Internet Gaming Disorder Scale (Continued)

		IGDS-SF		p	Effect Size (Odds Ratio/ Cohen's d/r)
		Low Risk (<36 Points) (n = 192)	High Risk (≥ 36 Points) (n = 58)		
		n (%)	n (%)		
Perceived impact of internet/ computer/smartphone use on daily life	Not at all	14 (93.3)	1 (6.7)	f .001**	OR = 0.223
	Very little	8 (88.9)	1 (11.1)		OR = 0.404
	Somewhat	42 (95.5)	2 (4.5)		OR = 0.128
	Much	66 (82.5)	14 (17.5)		OR = 0.607
	Very much	62 (60.8)	40 (39.2)		OR = 4.659
Type of game played	Board and card games (chess, checkers, backgammon, etc.)	10 (76.9)	3 (23.1)	f .566	-
	Sports games (football, basketball)	9 (100)	0 (0.0)		
	Racing games (car, motorcycle)	4 (80.0)	1 (20.0)		
	Strategy games (family, city- building)	88 (76.5)	27 (23.5)		
	War games	81 (75.0)	27 (25.0)		
Depression score	Mean \pm SD	3.31 \pm 2.00	4.14 \pm 1.98	s .006**	d = -0.414
Anxiety score	Mean \pm SD	1.44 \pm 1.24	2.28 \pm 1.68	m .001**	r = 0.220
Anger Control Problem score	Mean \pm SD	2.15 \pm 1.43	2.53 \pm 1.89	s .153	-
Sensation-Seeking Behavior score	Mean \pm SD	1.42 \pm 1.51	2.45 \pm 1.77	m .001**	r = 0.255
Lack of Assertiveness score	Mean \pm SD	4.60 \pm 2.49	5.79 \pm 3.00	s .007**	d = -0.457
Impulsivity score	Mean \pm SD	3.09 \pm 1.64	3.53 \pm 1.62	s .074	d = -0.269

Note: GD = Gaming disorder; IGDS-SF = Internet Gaming Disorder Scale – Short Form; SD = Standard deviation; N = Sample Size; OR = Odds ratio; d = Cohen's d; r = Effect size;

c Chi-square test.

f Fisher – Freeman – Halton test.

g Fisher's Exact test.

h Student t-test.

m Mann – Whitney U-test.

* $p < .05$; $p < .01$.

may not determine the progression of the disorder and that additional risk factors likely play a role. Similarly, Kim et al. (2015) found no significant associations between GD and sociodemographic variables in an adult sample.

In this study, being married was found to be associated with a higher likelihood of problematic gaming behavior. Although marital status has predominantly been linked to single individuals in the literature (Kim et al., 2015), some studies have reported similar associations among couples (Liao et al., 2020), while others have found no significant differences between the two groups (Rho et al., 2016). Therefore, the influence of demographic factors on IGD remains controversial, and further research is needed to clarify these relationships. Blasi et al. (2019) indicated that problematic gamers tend to use online games as a means of coping with negative emotions or as an escape strategy. In this study, psychological characteristics such as anxiety and lack of assertiveness appeared to be more common among individuals in the high-risk group, which may indicate a tendency to use gaming as an ineffective coping strategy. In this context, marital problems

could be indirectly related to gaming behavior. Moreover, high technological proficiency and lack of external supervision among young adults have been identified as potential risk factors for gaming disorder (Chia et al., 2020).

An analysis of these findings revealed that participants reported having considerable amounts of free time, with online gaming appearing as an increasingly popular leisure activity (Wang & Cheng, 2022). However, previous research has suggested that devoting most leisure time to gaming may be associated with a greater risk of addiction (Severo et al., 2020). Consistent with this, this study found that individuals who identified gaming as their primary purpose for internet use were more likely to report higher levels of gaming-related problems. These results may indicate that allocating a large portion of one's leisure time to gaming could increase vulnerability to problematic use.

These findings also revealed that most participants reported spending more than 6 hours per day on gaming and internet use. While some studies in the literature have found a strong association between time spent gaming and GD, others have reported

Table 5.
Logistic Regression Analysis of Factors Associated with High-Risk Status on the Internet Gaming Disorder Scale – Short Form

	β	SE	<i>p</i>	OR	95% CI	
					Lower	Upper
Gender (Male)	1.999	0.879	.023*	7.384	1.319	41.349
Marital status (Married)	1.312	0.623	.035*	3.713	1.095	12.583
Amount of leisure time (Never/Rarely)			.459			
Amount of leisure time (Sometimes)	-0.723	1.010	.474	0.485	0.067	3.511
Amount of leisure time 1 (Most of the day/ Almost all day)	-0.080	0.931	.932	0.923	0.149	5.723
Main purpose of internet use (Computer games)	1.583	0.645	.014*	4.868	1.375	17.236
Daily game playing time in recent period (4 – 5 hours per day)	0.320	0.600	.594	1.378	0.425	4.469
Perceived impact on life (Not at all)			.013*			
Perceived impact on life (Very little)	1.358	1.757	.439	3.888	0.124	121.596
Perceived impact on life (Somewhat)	-0.615	1.512	.684	0.541	0.028	10.478
Perceived impact on life (Much)	1.505	1.346	.263	4.506	0.322	63.060
Perceived impact on life (Very much)	2.089	1.344	.120	8.076	0.579	112.608
Depression score	-0.075	0.126	.550	0.928	0.725	1.187
Anxiety score	0.336	0.158	.033*	1.399	1.027	1.905
Anger Control Problem score	0.024	0.134	.858	1.024	0.788	1.331
Sensation-Seeking Behavior score	0.540	0.128	.001**	1.716	1.336	2.206
Lack of Assertiveness score	0.210	0.084	.013*	1.233	1.045	1.455
Impulsivity score	-0.019	0.136	.888	0.981	0.751	1.282
Constant	-8.492	2.132	.001**	0.000		

p < .05, *p* < .01. Dependent variable: Internet Gaming Disorder High Risk (≥ 36 score).
 Note: OR = Odds ratio; SE = Standard error.

weaker or more moderate relationships. Because certain studies indicate that prolonged gaming becomes problematic only under specific conditions, the role of gaming time remains debated (Katz et al., 2024). It has been proposed that as gaming time increases,

the number of endorsed addiction criteria tends to rise, although excessive gaming time alone does not necessarily imply addiction (Pontes et al., 2022). In this study, participants frequently reported that gaming interfered with their daily functioning.

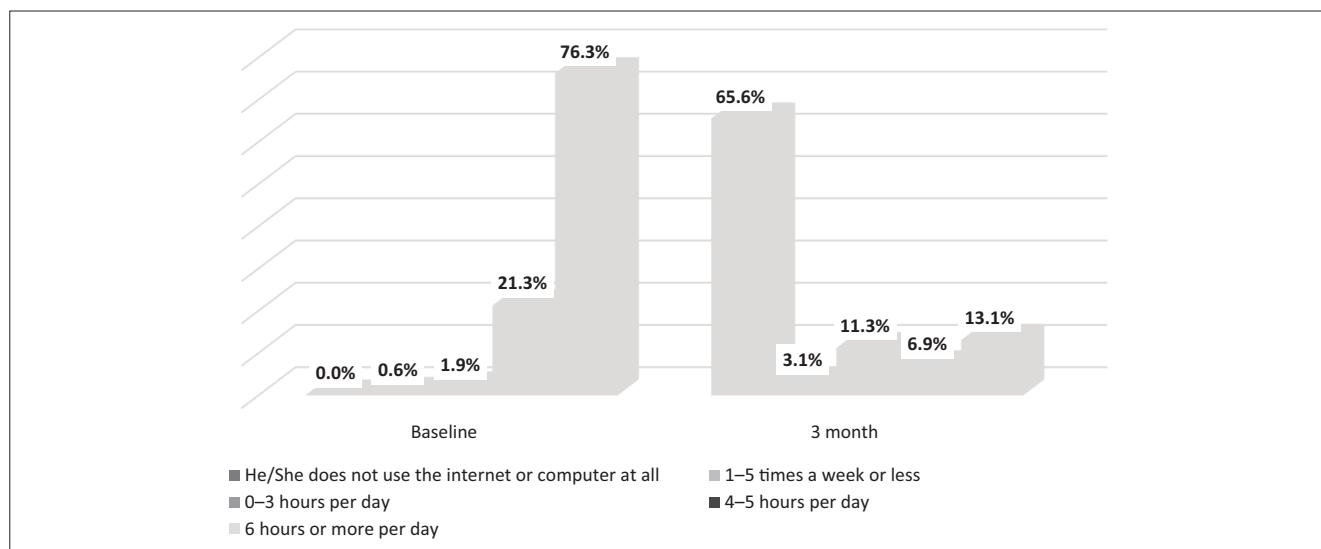


Figure 2. Frequency of game playing at assessment and three month follow-up (n=160)

In terms of preferred game types, strategy and war-themed games were particularly prominent in this sample. Recent research, consistent with these findings, has shown that massively multiplayer online role-playing games, first-person shooters, real-time strategy, and multiplayer online battle arena games tend to be associated with longer gaming durations and higher levels of IGD symptoms (Eichenbaum et al., 2015; Rehbein et al., 2021). The reward/punishment mechanisms, social interaction opportunities, and monetization systems embedded in these games have been suggested as potential factors contributing to more frequent gaming and higher scores on self-report measures of GD (Rehbein et al., 2021). Furthermore, violent games have been reported to be more frequently played by males, which may relate to the competitive, aggressive, and violent elements present in such games (Krahé & Möller, 2004).

Although this study did not find a statistically significant overall gender difference, regression analyses revealed that men were 7.38 times more likely than women to be classified in the high-risk group. This may indicate that intensive gaming among male players could reflect a higher vulnerability to IGD. In addition, a study comparing gaming behaviors, personality traits, and motivations across game genres reported that more than 30% of strategy game players and over 40% of action-shooter players played primarily to seek excitement or cope with negative emotions (Liao et al., 2023). Similarly, this study found that sensation-seeking behavior was significantly higher among individuals in the high-risk group. By contrast, impulsivity—often reported in the literature as a relevant risk factor—was not significantly associated with IGD in this sample. Other studies have also reported that the relationship between impulsivity and IGD appears to be limited or inconsistent (Wölfling et al., 2019). The absence of a clear cutoff point for impulsivity in the scales used, as well as limitations in sample size, may help explain why this relationship did not emerge statistically in these findings.

In this study, the high-risk group constituted 23% of participants. Psychological evaluations indicated that these individuals were at relatively higher risk overall. Examination of the API-C subscales revealed that participants in the high-risk group had significantly higher mean scores on depression, anxiety, sensation-seeking behavior, and lack of assertiveness compared to the low-risk group. The literature similarly shows that psychiatric disorders such as depression and anxiety frequently co-occur with GD (Burkauskas et al., 2022). Furthermore, it has been emphasized that GD and psychiatric disorders may mutually influence each other over time through bidirectional relationships (Amendola et al., 2025). In line with this, the finding that a substantial proportion of participants in this study had a history of psychiatric or psychological treatment is consistent with previous research on IGD comorbidity. In addition, recent studies suggest that certain psychological variables might act as mediators in the development of IGD. For instance, Tatu et al. (2025) showed through structural equation modeling that assertiveness levels may mediate the relationship between psychosocial factors and IGD symptoms.

Importantly, among those with the highest daily gaming frequency, a decrease was observed 3 months after seeking treatment.

This may reflect increased self-awareness and behavioral adjustment during the treatment process rather than a direct treatment effect. This finding is consistent with review results suggesting that participation in treatment programs for gaming disorder is often associated with reductions in gaming time and symptoms, as well as improved self-awareness and motivation for change (Gavriel-Fried, 2023).

Limitations

Our study has several limitations. First, the relatively small sample size restricts the generalizability of the findings. Additionally, the male predominance in the sample limits the generalizability of the findings. Second, the use of self-report measures carries the possibility of response bias, as participants may have portrayed themselves in a more favorable or unfavorable manner. Third, the cross-sectional design prevents causal inferences from being drawn. Finally, the absence of established cutoff points for certain psychological characteristics, such as impulsivity, may have limited the interpretation of the results.

This study examined the sociodemographic, clinical, and psychological profiles of adults presenting for treatment of IGD in Türkiye. As the first study of its kind, it yields important results. The findings of this study indicate that IGD is a growing concern among adults, reflecting patterns previously documented in children and adolescents. Studies in adult populations have similarly reported associations between IGD and psychological difficulties such as depression and anxiety. These results are consistent with this body of evidence, showing that participants at high risk for IGD exhibited significantly higher levels of psychiatric symptomatology. Importantly, these psychological problems can serve as both antecedents and consequences of IGD.

Intervention and treatment programs that incorporate psychosocial dimensions—such as depression, anxiety, sensation seeking, and lack of assertiveness—rather than focusing exclusively on gaming behavior are likely to be more effective. In addition, attention should be paid to game genres that feature addictive mechanics (e.g., reward-punishment structures, monetization, and social interaction systems), and awareness-raising initiatives targeting these risk elements should be developed.

Regarding sociodemographic factors, the literature remains inconclusive: while some studies report no significant associations, others identify certain variables as potential correlates of IGD. The increase in treatment seeking, particularly among women, highlights the need for additional studies in this field. Therefore, careful consideration of sociodemographic characteristics is warranted in the design of prevention and intervention strategies.

Finally, future research should aim to use larger and more representative adult samples, employ longitudinal designs to clarify causal pathways, and further refine assessment tools to ensure cultural validity.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: The study received approval from the institutional ethics committee (Date: July 9, 2025; meeting no.: 2025/338).

Informed Consent: Written informed consent was obtained from the participants who agreed to take part in the study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – T.B., H.M., D.D., B.Y.O., Y.K., H.D., G.U.; Design – T.B., H.M., D.D., B.Y.O., Y.K., H.D., G.U.; Supervision – T.B., H.M., D.D., B.Y.O., Y.K., H.D., G.U.; Resources – T.B., H.M., D.D., B.Y.O., Y.K., H.D., G.U.; Materials – T.B., H.M., D.D., B.Y.O., Y.K., H.D., G.U.; Data Collection and/or Processing – T.B., H.M., D.D., B.Y.O., Y.K., H.D., G.U.; Analysis and/or Interpretation – T.B., H.M., D.D., B.Y.O., Y.K., H.D., G.U.; Literature Search – T.B., H.M., D.D., B.Y.O., Y.K., H.D., G.U.; Writing Manuscript – T.B., H.M., D.D., B.Y.O., Y.K., H.D., G.U.; Critical Review – T.B., H.M., D.D., B.Y.O., Y.K., H.D., G.U.

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ORIGINAL ARTICLE

Exploring Academic Trends in Gaming Disorder Research in Türkiye: A Bibliometric and Descriptive Content Analysis of Graduate Theses (2010 – 2024)

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Main Points

- Graduate theses on gaming disorder in Türkiye surged after International Classification of Diseases for Mortality and Morbidity Statistics 11th edition (ICD-11) recognition in 2019, peaking in 2024.
- Quantitative, cross-sectional designs dominate graduate theses with limited longitudinal, qualitative, or interventional approaches.
- Local game addiction scales were used more frequently than Diagnostic and Statistical Manual of Mental Disorders Fifth Edition or ICD-11-based tools.
- Türkiye's research landscape shows unique emphases on preschool populations and is shaped by national institutions and academic events.
- Future studies should prioritize standardized diagnostic frameworks, methodological diversity, and policy-relevant interventions.

Abstract

This study aimed to systematically examine graduate-level scholarship on gaming disorder in Türkiye, mapping academic production and thematic orientations. A bibliometric and descriptive content analysis was conducted on theses archived in the National Thesis Center of the Council of Higher Education. Using the keywords “gaming disorder” and “game addiction,” 337 eligible master’s, doctoral, and medical specialization theses published between 2010 – 2024 were identified and coded for publication year, degree, institution, methodology, sample characteristics, diagnostic frameworks, and measurement tools. Results revealed $n = 337$ studies, which increased notably after Diagnostic and Statistical Manual of Mental Disorders Fifth Edition introduced Internet Gaming Disorder (2013) and surged following International Classification of Diseases for Mortality and Morbidity Statistics 11th edition’s recognition of Gaming Disorder (2019), peaking in 2024. Most graduate theses were master’s level (84.0%, $n = 283$), quantitative (93.4%, $n = 315$), and cross-sectional (94.0%, $n = 317$), with adolescents as the predominant study population (54.6%, $n = 184$). Local “digital game addiction” scales were more frequently used than Diagnostic and Statistical Manual of Mental Disorders Fifth Edition or International Classification of Diseases for Mortality and Morbidity Statistics 11th edition-based measures. Few studies employed qualitative, longitudinal, or interventional designs. Distinctive trends included research on preschool populations. Possible influences of national academic and institutional initiatives are discussed. In conclusion, graduate research on gaming disorder in Türkiye reflects both international patterns and unique local emphases. Recommendations are made for future work.

Keywords: Addictions to technology, behavioral addiction, bibliometric study, content analysis, game addiction, gaming disorder, graduate thesis, internet gaming disorder, Türkiye

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Introduction

Gaming has become one of the most common leisure activities worldwide. For most, it is a recreational and social activity with potential benefits reported for some game types (Liang et al., 2023). However, for some individuals, excessive gaming behaviors lead to significant difficulties and impairment in daily functioning (Gao et al., 2022; Stevens et al., 2021). The clinical recognition of problematic and disordered gaming patterns has evolved significantly over the past two decades. The American Psychiatric Association (APA) included Internet Gaming Disorder (IGD) in the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5; American Psychiatric Association, 2013) as a condition warranting further study, while the World Health Organization (WHO) formally classified Gaming Disorder (GD) in the International Classification of Diseases for Mortality and Morbidity Statistics 11th edition (ICD-11; World Health Organization, 2019) under “disorders due to addictive behaviors.” The inclusions by APA and WHO underscored the concerns about the addictive potential of digital games and sparked extensive research (Zhou et al., 2024).

Based on progress in the field, a variety of measurement tools have been developed to assess problematic gaming in adolescents and young people (King et al., 2020). Most commonly used tools have been reported as the Young Internet Addiction Scale by Young (1998), the Game Addiction Scale 7-item and 21-item forms by Lemmens et al. (2009), and the IGD Scale 9-item Short Form (IGDS-9-SF) by Pontes et al. (2015). Research has linked problematic gaming to a wide range of issues, including cognitive changes, academic decline, mental disorders, sleep problems, obesity, interpersonal difficulties, and (Che Mokhtar & McGee, 2025; Choi et al., 2021; Kristensen et al., 2021; Li et al., 2023; Richard et al., 2020). These are especially crucial for adolescents, who reportedly have a higher risk of addiction to gaming (Stevens et al., 2021). In addition, a wide variety of psychiatric symptoms and diagnoses have been reported comorbid with problematic gaming, which may require additional treatment (Coutelle et al., 2024; İçen et al., 2025).

In Türkiye, interest in GD began in the late 2000s and has grown in parallel with global developments (Arıcak et al., 2019; Ayas et al., 2011; Cakiroglu & Gormez, 2020; Evren et al., 2017; Evren et al., 2018; Horzum et al., 2008). Recent systematic reviews indicate that digital game use is widespread, with young males being particularly at risk (Boz & Dinç, 2023). Researchers from different scientific backgrounds, including psychology, education, and medicine, are working towards adopting the most current global trends in GD research (Başdaş et al., 2024; Palanbek Yavaş et al., 2023; Tunçturk et al., 2023). Institutions and scientific organizations working against addictive disorders aim to increase awareness and provide support for the dissemination of knowledge (Yeşilay, 2016; Yeşilay, 2018).

An earlier review article of graduate theses conducted in 2019 reported a notable increase in studies following the introduction of IGD in the DSM-5, with a concentration of studies emerging after 2018 (Taş, 2019). Since that review, no bibliometric study has systematically mapped the evolution, methodological orientations, and thematic patterns of graduate-level research in this

domain. Bibliometric analyses offer a valuable understanding of research trends, methodological gaps, and thematic emphases within a scientific field (Passas, 2024). By focusing on graduate theses, which represent the training ground for future scholars and the seeds of academic production, insights can be gained into evolving conceptualizations of GD. Such an approach can also highlight how local cultural, social, and institutional factors shape the trajectory of research compared to global trends.

The present study aims to explore the academic trends in GD research in Türkiye by conducting a bibliometric and content analysis of graduate theses. Specifically, this study examines (i) the temporal distribution of the studies, (ii) methodological characteristics and measurement tools, (iii) thematic domains studied, and (iv) potential gaps and future directions. By mapping the landscape of graduate-level scholarship, this study contributes to a clearer understanding of how GD has been conceptualized and investigated within the Turkish academic context, and how this aligns with or diverges from international literature.

Material and Methods

This study employed a mixed bibliometric and descriptive content analysis approach to examine graduate theses focusing on GD in Türkiye.

Data Source and Search Strategy

Data were obtained from the National Thesis Center of the Council of Higher Education of Türkiye (Ulusal Tez Merkezi; <https://tez.yok.gov.tr>), which archives all master’s and doctoral theses, as well as medical specialization theses, submitted to Turkish universities. The search was conducted in August 2025 using the database’s keyword search function. Two terms were applied: (1) “*gaming disorder*” (English), yielding 54 results, and (2) “*oyun bağımlılığı*” (Turkish equivalent of “game addiction”), yielding 285 results.

Eligibility Criteria

All publicly available master’s, doctoral, and medical specialization theses related to GD or problematic gaming were eligible for inclusion. Embargoed theses, duplicates, and records unrelated to GD (e.g., studies focusing exclusively on social media or substance addictions) were excluded. Remaining thesis studies ($n = 337$) were analyzed. Screening was performed in two stages: first by titles and abstracts, and then by keywords and methodology to ensure thematic relevance.

Data Extraction and Coding Variables

A bibliometric coding sheet was developed in Google Sheets to collect metadata for each thesis. All theses were coded by the first author. To ensure consistency, coding rules were pre-defined, and ambiguous cases were revisited until stable categorization was achieved. Extracted variables included: Year of publication, type of degree (master’s, doctoral, or medical specialization), institution and department, thesis advisor(s), methodology (quantitative, qualitative, or mixed), study design (cross-sectional, longitudinal, interventional, or other), sample type (clinical vs. community), target age group (children, adolescents, young adults, adults, preschoolers, mixed), diagnostic framework used (DSM-5 or ICD-11, if any), and measurement tools employed (e.g., IGDS, CIUS, PIUQ, Game Addiction Scales). The data were

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analyzed using frequency counts, cross-tabulations, and simple visualizations (e.g., trend graphs and word clouds) to explore the development of academic interest and methodological patterns in GD research within Turkish higher education.

Data Analysis

The data were analyzed using frequency counts, descriptive cross-tabulations, and simple visualizations to identify temporal and methodological patterns. Trend graphs were generated in Microsoft Office Word, and a word cloud was created using a free web tool to illustrate the most frequent thematic terms in thesis titles. No inferential statistics were performed, as the primary aim was descriptive mapping of academic trends.

Results

Bibliometric Findings

The total number of graduate thesis studies on GD/game addiction between 2010 and 2024 is 337 in the National Thesis Center of the Council of Higher Education of Türkiye. A trend graph is presented in Figure 1, showing the distribution of frequency each year. The earliest graduate thesis study on GD/game addiction was conducted in 2010 ($n = 1$). A notable increase in frequency is observed beginning in 2018 ($n = 22$) and 2019 ($n = 42$), reaching the peak in 2024 ($n = 80$).

Bibliometric findings revealed that most of the graduate thesis studies on GD/game addiction were master's theses (84.0%, $n = 283$) with specializations in medicine ($n = 34$) and doctorate ($n = 20$) theses being relatively fewer in number (see Table 1). In terms of institutions, Üsküdar University produced the most graduate theses ($n = 28$), followed by Health Sciences University ($n = 14$), İstanbul Sabahattin Zaim University ($n = 14$), Bahçeşehir University ($n = 13$), and İstanbul Gelişim University ($n = 12$). Graduate thesis studies on GD/game addiction were conducted mainly by the Departments of Clinical Psychology ($n = 67$), Psychological Counseling and Guidance ($n = 51$), Physical Education and Sport Sciences ($n = 32$), Child and Adolescent Psychiatry ($n = 24$), and Psychology ($n = 22$). The advisors who focused most frequently on GD/game addiction were Gül

Karaçetin ($n = 9$), Yavuz Samur ($n = 6$), İbrahim Taş ($n = 5$), Hüseyin Ünübol ($n = 4$), and Metehan Irak ($n = 4$).

Content Analysis Findings

Table 2 shows findings related to descriptive content analysis of graduate thesis studies on GD/game addiction. Most studies were conducted in community samples ($n = 304$), with fewer studies in clinical samples ($n = 29$). In terms of sample, more than half of the graduate thesis studies targeted adolescents (54.6%, $n = 184$), followed by young adults ($n = 47$), adults ($n = 42$), children and adolescents ($n = 15$), all ages ($n = 13$), and preschool children ($n = 13$). In terms of methodology, the studies were mainly quantitative (93.4%, $n = 315$), with mixed methods ($n = 10$) and qualitative ($n = 5$) studies less frequent. Five methodological studies adapted measurement tools to the Turkish language and culture. Cross-sectional study designs (94.0%, $n = 317$) were the most common, followed by interventional studies ($n = 12$). Intervention programs adopted by the interventional studies ($n = 12$) were named as “bibliotherapy for adolescents,” “bullying intervention program,” “CBT vs counselling on gaming disorder,” “exergaming intervention or aerobic exercise intervention,” “game addiction intervention program,” “internet-based education for parents,” “intervention program for parents,” “motivational interviewing based psychoeducation program,” “physically active play program,” “positive psychology based psychoeducation program,” “psychoeducation program based on cognitive-behavioral play therapy,” “self-control focused psychoeducation program,” and “solution-focused group intervention for adolescents.”

Most of the studies (87.2%, $n = 294$) did not use any of the diagnostic frameworks for defining game addiction (see Table 2). The DSM-5 IGD definition ($n = 57$) was used more commonly than the ICD-11 GD definition ($n = 2$). The Game Addiction Scale by Lemmens et al. (2009) came to the fore among the measurement tools used in graduate thesis studies, followed by the Digital Game Addiction Scale for Children by Hazar & Hazar (2017), the IGD Scale 9 – Short form by Pontes & Griffiths (2015), the Computer Game Addiction Scale for Children by Horzum et al., (2008), the Online Game Addiction Scale by Kaya (2013), the Digital

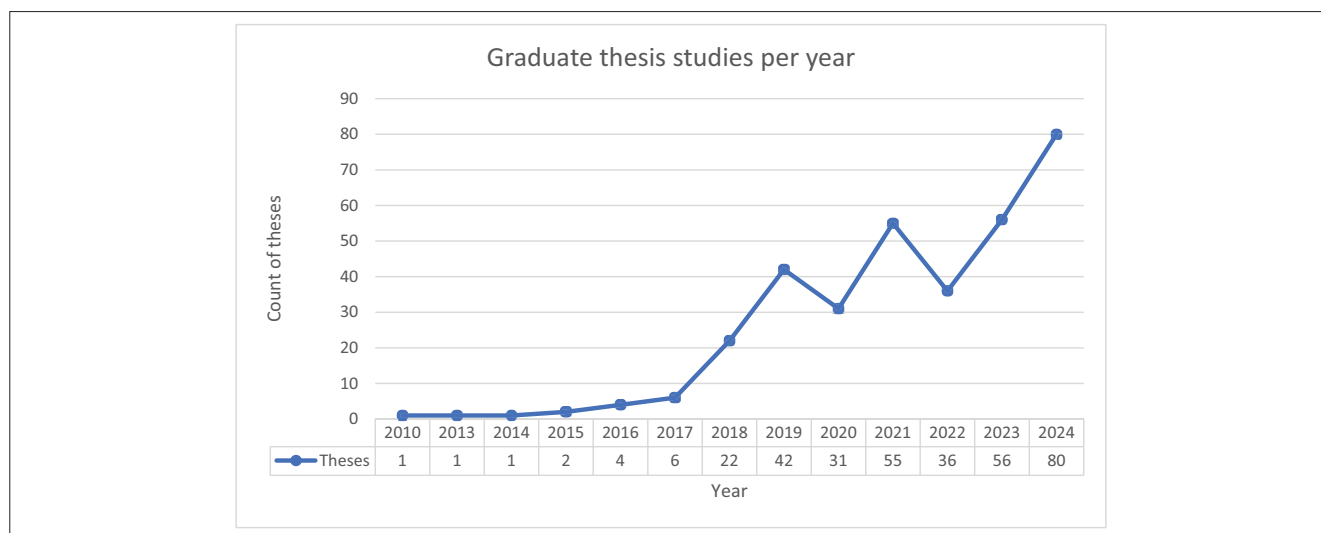


Figure 1. Trend Graph Showing the Distribution of Graduate Thesis Studies Per Year. Data Source: Ulusal Tez Merkezi (accessed August 2025).

Table 1.
Bibliometric Findings (n = 337)

Degree	n (%)
Master's thesis	283 (84.0)
Specialization in Medicine	34 (10.1)
Doctorate	20 (5.9)
Institution	n (%)
Üsküdar University	28 (8.3)
Health Sciences University	14 (4.2)
İstanbul Sabahattin Zaim University	14 (4.2)
Bahçeşehir University	13 (3.9)
İstanbul Gelişim University	12 (3.6)
Sakarya University	11 (3.3)
Gazi University	10 (3.0)
Haliç University	10 (3.0)
Necmettin Erbakan University	9 (2.7)
Hasan Kalyoncu University	8 (2.4)
Akdeniz University	6 (1.8)
Ankara University	6 (1.8)
Çağ University	6 (1.8)
İnönü University	6 (1.8)
İstanbul University	6 (1.8)
Kırıkkale University	6 (1.8)
Others	172 (51.0)
Department	n (%)
Clinical Psychology	67 (19.9)
Psychological Counselling and Guidance	51 (15.1)
Physical Education and Sport Sciences	32 (9.5)
Child and Adolescent Psychiatry	24 (7.1)
Psychology	22 (6.5)
Child Development	13 (3.9)
Computer Education and Instructional Technologies	9 (2.7)
Education Sciences	7 (2.1)
Nursing	6 (1.8)
Preschool Education	6 (1.8)
Public Health Nursing	6 (1.8)
Educational Technologies	5 (1.5)
Addiction Psychology	4 (1.2)
Family Medicine	4 (1.2)
Psychiatry	4 (1.2)
Public Health	4 (1.2)
Social Services	4 (1.2)
Others	69 (20.5)

(Continued)

Table 1.
Bibliometric Findings (n = 337) (Continued)

Degree	n (%)
Advisor	n (%)
Gül Karaçetin	9 (2.7)
Yavuz Samur	6 (1.8)
İbrahim Taş	5 (1.5)
Hüseyin Ünübol	4 (1.2)
Metehan Irak	4 (1.2)
Zekihan Hazar	3 (0.9)
Semiha Füsün Akdağ Aycibin	3 (0.9)
Cemal Onur Noyan	3 (0.9)
Others	300 (89.0)

Game Addiction Scale for University Students by Hazar & Hazar (2019), the Game Addiction Scale for Adolescents – Short form by Anlı & Taş (2018), and the Digital Game Addiction Tendency Scale for Preschool Children by Budak & Işıkoğlu (2022).

Finally, Table 3 shows findings of the content analysis focusing on the titles of graduate thesis studies. Accordingly, parent(s) ($n = 30$), physical activity/exercise ($n = 19$), sport(s) ($n = 19$), anxiety ($n = 17$), attachment ($n = 16$), motivation ($n = 16$), and school ($n = 16$) were the most common words in titles. A word cloud image reflecting the content analysis of graduate theses based on their titles is presented in Figure 2.

Discussion

This study presents the first comprehensive bibliometric and content analysis of graduate theses on GD in Türkiye, highlighting how both international milestones and national dynamics have influenced local academic work. The findings suggest that Turkish research reflects many global patterns, while also carrying distinctive features tied to its academic and cultural setting.

The timeline of graduate theses demonstrates how closely academic attention follows changes in diagnostic systems. A modest increase was seen after DSM-5 listed IGD as a condition warranting study in 2013 (APA, 2013), but the real surge came after the ICD-11's formal recognition of GD in 2019 (WHO, 2019). The peak in 2024 suggests that nosological milestones not only affect clinical practice but also act as signals of legitimacy, guiding graduate research agendas. National factors have also played a clear role. Behavioral addiction congresses and symposia organized by The Green Crescent Society (Yeşilay) since 2016 created opportunities for visibility and networking, which likely encouraged students and supervisors to choose this subject (Yeşilay, 2016), and the clustering of graduate theses in Istanbul universities underscores this metropolitan effect. Scholarships and grants offered by Yeşilay for graduate thesis studies on addictive disorders, including behavioral addictions, have also been influential (Yeşilay, 2018). This combination of academic events and institutional support seems to have directly fostered the growth of thesis work on GD.

Methodological patterns in Turkish theses align with global trends, with quantitative cross-sectional designs emerging as the

Table 2.
Descriptive Content Analysis Findings (n = 337)

Methodology	n (%)
Quantitative	315 (93.5)
Mixed methods	10 (3.0)
Qualitative	5 (1.5)
Methodological	5 (1.5)
Simulation	2 (0.6)
Study design	n (%)
Cross-sectional study	317 (94.1)
Interventional study	12 (3.6)
Simulation study	2 (0.6)
Experimental study	2 (0.6)
Document analysis	2 (0.6)
Phenomenological analysis	1 (0.3)
Narrative analysis	1 (0.3)
Sample	n (%)
Community sample	304 (90.2)
Clinical sample	29 (8.6)
Secondary data used	4 (1.2)
Target age group	n (%)
Adolescents	184 (54.6)
Young adults	47 (13.9)
Adults	42 (12.5)
Children and adolescents	15 (4.5)
All ages	13 (3.9)
Preschool children	13 (3.6)
Children	12 (3.6)
Transition age youth	4 (1.2)
Not applicable	4 (1.2)
Not specified	3 (0.9)
Diagnostic framework	n (%)
DSM-5 internet gaming disorder	55 (16.3)
ICD-11 gaming disorder	3 (0.9)
None	279 (82.8)
Measurement tool	n (%)
Game Addiction Scale (Lemmens et al., 2009)	98 (29.1)
Digital Game Addiction Scale for Children (Hazar & Hazar, 2017)	45 (13.4)
Internet Gaming Disorder Scale 9 - Short form (Pontes & Griffiths, 2015)	40 (11.9)
Computer Game Addiction Scale for Children (Horzum et al., 2008)	28 (8.3)
Online Game Addiction Scale (Kaya, 2013)	21 (6.2)
Digital Game Addiction Scale for University Students (Hazar & Hazar, 2017)	17 (5.0)

(Continued)

Table 2.
Descriptive Content Analysis Findings (n = 337) (Continued)

Methodology	n (%)
Game Addiction Scale for Adolescents - Short form (Anlı & Taş, 2018)	14 (4.2)
Digital Game Addiction Tendency Scale for Preschool Children (Budak & Işıkoğlu, 2022)	11 (3.3)
Internet Gaming Disorder-20 Test (Pontes et al., 2014)	9 (2.7)
Young Internet Addiction Scale (Young, 1998)	8 (2.4)
Game Addiction Inventory for Adults (Wong & Hodgins, 2014)	5 (1.5)
Computer Game Addiction Scale for Adolescents (Ayas et al., 2011)	5 (1.5)
Others	36 (10.7)

predominant approach (Paulus et al, 2018; Stevens et al., 2021). While these designs are useful for mapping prevalence and correlates, they do little to explain how gaming problems develop over time or to test potential interventions. Qualitative and longitudinal work remains rare. As in international studies, adolescents are the most frequently examined group (Stevens et al., 2021). What sets Türkiye apart is the presence of several graduate theses on preschool children (n = 13), a population rarely studied elsewhere. While the validity of diagnosing GD in very young children may be debated, these early efforts highlight growing societal concern about digital exposure in early childhood (Budak & Işıkoğlu, 2022).

Another distinctive aspect of Turkish theses is the heavy reliance on locally developed “digital game addiction” scales, rather than DSM-5 or ICD-11 criteria (Ayas et al., 2011; Hazar & Hazar, 2017; Horzum et al., 2008; Kaya, 2013). While this reflects national research traditions, it also contributes to the broader problem of measurement heterogeneity, which continues to limit comparability and weaken the field’s credibility. One potential explanation for this can be that measurement tools based on ICD-11 GD classification were not adapted and used in Turkish until recently, although there is a growing recognition and interest in addictive gaming behaviors following the ICD-11 GD inclusion (Başdaş et al., 2024; Palanbek Yavaş et al, 2023; Tuncturk et al., 2023).

Recurring themes across Turkish graduate theses included emotion regulation, loneliness, parental attitudes, peer relationships, and social anxiety, topics consistent with international findings linking GD to psychosocial vulnerabilities (Chang et al., 2023). Turkish research also frequently explored topics such as bullying, resilience, and sports participation, highlighting the impact of educational and developmental psychology perspectives. In contrast, areas more common internationally, such as neurocognitive processes, neuroimaging, or cross-cultural comparisons, were seldom addressed. This likely reflects the disciplinary focus of most programs (psychology, counseling, education) where these theses were produced.

Overall, graduate research in Türkiye both parallels and diverges from the international field. The similarities lie in the emphasis

Table 3.
Content Analysis Focusing on the Titles of Graduate Thesis Studies ($n = 337$)

Content	n (%)
Parent(s)	30 (8.9)
Physical activity/exercise	19 (5.6)
Sport(s)	19 (5.6)
Anxiety	17 (5.0)
Attachment	16 (4.7)
Motivation	16 (4.7)
School	16 (4.7)
Cognitive/cognition	15 (4.5)
Emotion regulation	15 (4.5)
Family/familial	14 (4.2)
Academic success/achievement	13 (3.9)
Aggression	13 (3.9)
Social anxiety/social appearance anxiety	13 (3.9)
Social media	12 (3.6)
Bullying	11 (3.3)
Loneliness	11 (3.3)
Peer(s)	11 (3.3)
Violence/violent	11 (3.3)
Impulsivity	10 (3.0)
Attention	9 (2.7)
Procrastination	9 (2.7)
Resilience	9 (2.7)
Social skills	9 (2.7)
Well-being	9 (2.7)
Demographics	8 (2.4)
Personality	8 (2.4)
Social support	8 (2.4)
Alexithymia	7 (2.1)
Sleep	7 (2.1)
Coping	6 (1.8)
Hyperactivity	6 (1.8)
Obesity	6 (1.8)
Self-esteem	6 (1.8)
Anger	5 (1.5)
Development	5 (1.5)
Self-control	5 (1.5)
Self-efficacy	5 (1.5)
Stress	5 (1.5)
Depression	4 (1.2)
Intelligence	4 (1.2)
Life satisfaction	4 (1.2)

(Continued)

Table 3.
Content Analysis Focusing on the Titles of Graduate Thesis Studies ($n = 337$) (Continued)

Content	n (%)
Memory	4 (1.2)
Mindfulness/mindful awareness	4 (1.2)
Nutrition	4 (1.2)
Psychological needs	4 (1.2)

on adolescents and psychosocial risks, while differences include reliance on local scales, the extension to preschool populations, and the strong influence of national institutions. Several implications can be derived. Greater use of internationally recognized tools would improve comparability with global studies. More diverse designs, especially longitudinal, interventional, and qualitative work, are needed to move beyond descriptive snapshots. Stronger interdisciplinary collaboration, particularly with technological sciences, could also enrich the field. Finally, the influence of policy initiatives and institutional actors highlights how research trajectories are shaped not only by scientific curiosity but also by structural and cultural forces.

The current study has some limitations. First, it relied on graduate theses archived in the National Thesis Center of the Council of Higher Education of Türkiye. While extensive, this database may exclude embargoed or unavailable theses. Second, bibliometric indicators were descriptive and did not include citation analysis, since theses are rarely indexed internationally, making their broader impact difficult to gauge. Finally, because the analysis was limited to Türkiye, findings cannot be generalized to other countries. Nonetheless, the study provides a valuable case example of how academic, institutional, and policy environments shape the emergence of research on newly defined conditions. This study set out to map how graduate-level research in Türkiye has approached GD over the past decade and a half. By systematically analyzing all graduate theses on GD between 2010 and 2024, this study provides the first comprehensive overview of how a global mental health issue has been conceptualized in Turkish academia. Its strengths lie in bringing visibility to a large body of otherwise inaccessible work, highlighting distinctive national emphases such as the attention to preschool populations, and situating these trends in relation to international diagnostic milestones and policy initiatives. In doing so, the study contributes both to local academic development and to cross-national discussions about the evolution of GD research.

The results paint a picture of a field that has grown rapidly, often in step with international developments, but also shaped by its own cultural and institutional dynamics. The introduction of IGD into the DSM-5 provided an early spark, but the decisive turning point came in 2019 with the ICD-11's recognition of GD. From that moment, the number of theses began to rise sharply, culminating in a peak in 2024. This pattern suggests that changes in diagnostic systems do not only guide clinical practice; they also shape the academic agenda by signaling legitimacy and urgency to researchers in training. National initiatives, such as addiction congresses and thesis grants, appear to have further amplified this trend, especially in metropolitan universities.



Figure 2. Word Cloud Image Based on the Content Analysis of Graduate Thesis Studies

Yet alongside this growth, certain limitations are clear. The majority of studies have remained descriptive, cross-sectional, and conducted with community samples, leaving important questions about developmental trajectories, mechanisms, and interventions unanswered. The preference for locally developed “digital game addiction” scales reflects a commitment to cultural relevance, but at the same time creates barriers for comparison with international research anchored in DSM-5 and ICD-11 frameworks. One distinctive feature of the Turkish landscape is the number of theses that have explored gaming behavior in preschool children. While unusual by international standards, this direction seems to mirror public concern about very early exposure to digital media. At the same time, areas that have received significant attention elsewhere, such as neurocognitive processes, neuroimaging, or cross-cultural comparisons, remain almost absent.

Looking ahead, several priorities emerge. Broadening methodological horizons will be key: longitudinal studies could help trace how gaming problems unfold across developmental stages, while qualitative and interventional designs would give voice to lived experiences and allow the testing of concrete solutions. Strengthening the use of standardized diagnostic frameworks would improve the ability to connect Turkish research with global debates, without abandoning the cultural insights that local measures provide. More attention to clinical and high-risk groups would also enrich the field, ensuring that research speaks to practice and policy rather than remaining confined to descriptive surveys.

Finally, there is a need to think about how graduate theses can travel further. Currently, many valuable studies remain inaccessible in university archives, thereby limiting their visibility and influence. Encouraging students and supervisors to publish their findings in peer-reviewed outlets could open the door to international dialogue and collaboration. In this way, Türkiye’s research community could both showcase its unique emphases, such as its attention to younger age groups, and also contribute more fully to the shared global effort to understand and respond to

GD. Importantly, translating academic findings into preventive and therapeutic strategies will also help inform national mental health policies, ensuring that research not only reflects scholarly curiosity but also supports the well-being of children, adolescents, and families across the country.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: This study was based on publicly available data from the National Thesis Center of Türkiye. As it did not involve human participants or identifiable private information, ethical approval was not required.

Informed Consent: Informed consent was not applicable since this research did not involve human participants.

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ORIGINAL ARTICLE

The Relationship between Undergraduate Students' Online Gaming Motivations, Gaming Addiction, and Online Prosocial Behaviors*

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Main Points

- Social and skill development motivations significantly predicted online prosocial behaviors among university students, while gaming addiction and other motivations (coping/escape, recreation, fantasy, and competition) did not.
- The regression model explained 11% of the variance in online prosocial behavior, with social motivation ($\beta = .243$) being the strongest predictor, followed by skill development motivation ($\beta = .206$).
- These findings suggest that gaming motivation is a stronger indicator of online prosocial behavior than gaming addiction, highlighting the need to consider motivational profiles in psychological and educational interventions.

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Abstract

This study examined the role of university students' gaming addictions and online gaming motivations in predicting their online prosocial behaviors. The data collection instruments used in the study were the Personal Information Form, Online Prosocial Behavior Scale for University Students, Motives for Online Gaming Questionnaire, and Digital Game Addiction Scale for University Students. A total of 452 undergraduate students participated in the study. According to the multiple linear regression analysis results, the model variables explained 11% of the variance in online prosocial behavior. However, gaming addiction and coping/escapism, fun, fantasy, and competition motivations were not significant predictors of online prosocial behaviors. The findings were discussed, and recommendations were presented.

Keywords: Gaming addiction, gaming motivation, online gaming, online prosocial behavior

Introduction

In Türkiye, more than 50% of individuals who play video games are under 35, with the majority being in the 18 – 34 age range, accounting for 38% (Ministry of Youth and Sports, 2021). Considering this, most individuals who play video games are university students. The university period is a critical developmental stage during which individuals explore their identities and attempt to understand themselves (Jourdan, 2006). How online games influence individuals' social behaviors and friendships has been emphasized. One of the prominent behaviors among these is prosocial behavior. Prosocial

behaviors are voluntary behaviors intended to help an individual or group without expecting any external reward or benefit (Eisenberg & Mussen, 1997). Prosocial behaviors, which can be described as positive interpersonal relationships, include empathy, cooperation, sharing, altruism, helping, and consoling others for their happiness and benefit, and are referred to as positive social behaviors (Uzmen & Mağden, 2002). Prosocial behaviors are exhibited in different ways throughout every stage of life; however, adolescence and young adulthood periods hold particular importance due to the growing significance of peer communication (Gardner & Steinberg, 2005). Therefore, examining the relationship



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between prosocial behaviors and online gaming behaviors among university students in emerging adulthood is also important for studies aimed at improving the quality of their friendships.

Studies have shown that competitive online games can reduce friendship quality and teamwork, lead to aggression, and lower prosocial behaviors. However, displaying positive social behavior to help others during the game enhances friendship quality after the game (Dowsett & Jackson, 2019; Jerabeck & Ferguson, 2013; Shao & Wang, 2019; Sherry, 2001; Velez et al., 2016; Zhao et al., 2021). Similarly, it has been reported that collaborative online games increase teamwork and cooperative behaviors outside the game (Badatala et al., 2016; Harrington & O'Connell, 2016; Martončík & Loksa, 2016). In online games, it has been observed that players being a leader or a group member and gaining social status in-game have positive effects on the socio-emotional development of individuals (Martončík, 2015). Therefore, the online social behaviors that individuals show to their opponents or teammates during the game may also be reflected in their relationships outside the game. For this reason, revealing the factors influencing online social behaviors is important in supporting the social development of individuals who play games.

Playing online games may be associated with individuals' prosocial behaviors. Studies suggest that online games also affect individuals' social development and contribute to their well-being by increasing peer interaction (Gitter et al., 2013; Masala & Iona, 2018). On the contrary, it has been observed that adolescents who play violent video games exhibit increased violent behaviors in their close friends in measurements taken 1 year later (Verheijen et al., 2018). In addition, the friendship quality of individuals who play competitive games against each other declines. However, the friendship quality of individuals who exhibit prosocial behaviors toward each other in the game may increase (Verheijen et al., 2019). The relationships and interactions established in the game also influence the interactions outside the game. It has been stated that players' social bonds are strengthened when they extend the relationships formed in online games into real-life (Trepte et al., 2012). For this reason, it is important to identify the factors that encourage individuals toward prosocial behaviors rather than aggressive behaviors during online gaming.

More studies are needed on the relationship between gaming addiction and prosocial behaviors. Studies reveal different results regarding the relationship between gaming addiction and prosocial behaviors (Esparza-Reig et al., 2022). Some studies show that the relationship between gaming addiction and prosocial behaviors is not significant, while some studies show that the relationship is negative (Boxer et al., 2015; Collins & Freeman, 2013; Lemmens et al., 2015; Yaghoobi, 2022). Based on this, since gaming addiction is seen to have a relationship with prosocial behaviors, it was addressed in this study.

Individuals' motivations for playing online games can change the effects of games. Individuals' motivations for online games can affect many situations, such as online game playing time, gaming addiction or disorder, and behavioral problems (Halbrook et al., 2019; Laconi et al., 2017). When the literature was examined, it was seen that different studies mentioned different motivations for playing games. According to one study, gaming motivations are classified into three groups: achievement

and recovery, curiosity and social acceptance, and uncertainty in-game demands (Tekkurşun Demir & Hazar, 2018). Another study categorizes motivations for playing games into five groups: concentration, entertainment, escape, learning, and socialization (Akyıldız Munusturlar & Munusturlar, 2018). Another study classifies the motivations for playing games into six groups: intrinsic motivation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation (Lafrenière et al., 2012). In contrast, Evren et al. (2020), divide the motivations for playing games into six main groups: social motivation, which involves making friends through gaming; coping/escape motivation, which focuses on escaping from real-life problems and reducing tension and anger through games; competition motivation, which centers on defeating others; skill development motivation, which is about skill acquisition such as coordination and focusing; fantasy motivation, which involves exploring new identities; and recreation motivation, which is about having a pleasant time. As observed, although there is no consensus in the literature regarding the number of motivations for playing games, it can be said that motivations such as social, recreational, and escape are common. However, when the studies are examined, it is understood that gaming motivations may affect social behaviors. For this reason, the relationship between gaming motivations and online prosocial behaviors was also addressed in this study.

When all these studies are examined, it is seen that the prosocial behaviors of university students are important in the relationships they will establish. For this reason, it is important to reveal the effect of online game playing, which may be related to prosocial behaviors and is becoming increasingly widespread among individuals. From this perspective, this study aims to explore the relationship between university students' online gaming motivations, gaming addiction, and their online prosocial behaviors.

Material and Methods

This study employs a quantitative research design and a relational research model, aiming to examine the predictive power of university students' digital gaming addiction and online gaming motivations on online prosocial behaviors. A convenience sampling method was used to collect data from the study group. In the convenience sampling method, the focus is on reaching participants who are easily accessible (Fraenkel et al., 2012).

Study Group

In the Spring Semester of the 2022 – 2023 academic year, 452 university students from various universities in Türkiye participated in the study. Of the students, 261 were male (57.7%), 185 were female (40.9%), four were non-binary (0.9%), two preferred not to specify their gender (0.4%), and 75 had low socioeconomic status (16.6%), 355 had medium socioeconomic status (78.5%), and 22 had high (4.9%) socioeconomic status. It is seen that 234 students (51.8%) who played games for an average of 0 – 2 hours per day mostly participated in the study, and 296 students (65.5%) who played games with people they knew face-to-face/in real-life participated in the study.

When the participants' education levels were examined, it was found that 403 associate and undergraduate students (89.5%) and 49 graduate students (11.9%) participated in the study. When the

grade levels of associate and undergraduate-level participants were examined, it was seen that 30 preparatory class students (6.7%), 86 first-grade students (19.1%), 89 second-grade students (19.7%), 113 third-grade students (25.1%), 70 fourth-grade students (15.5%), eight fifth-grade students (1.8%), and seven sixth-grade students (1.6%) participated in the study.

When the universities where the participants studied were analyzed according to the Classification of Statistical Regional Units, the highest number of participants was from the Western Black Sea region, coded TR8, with 152 students (33.6%), and the lowest number of participants was from the Middle Eastern Anatolia region, coded TRB, with eight students (1.8%). When the departments in which the participants were studying were examined, the highest number of students was from the Department of Guidance and Psychological Counseling, with 34 students (7.5%), and Management Information Systems and Elementary Mathematics Education, both with 31 students (6.9%). When the games that the participants played the most were analyzed, it was found that League of Legends (LoL) was the most preferred game, with 98 students (21.7%), followed by Valorant with 73 students (16.2%).

Data Collection Tools

Personal Information Form: The Personal Information Form, developed by the researchers, consists of nine questions. In this form, age, university, and department data are obtained from the participants by the open-ended question method; gender, grade level, socioeconomic level, average daily game playing time, most played game, and the person played with are obtained by the multiple-choice question method.

Motives for Online Gaming Questionnaire: It was developed by Evren et al. (2020). The scale consists of 27 items scored on a 5-point Likert scale and six factors (coping/escape, recreation, fantasy, skill development, social, and competition). A high score from a factor indicates that the relevant motivation is at the forefront of the individual. As a result of the exploratory factor analysis conducted within the scope of the validity study, it was found that the scale consisted of six factors and 27 items. This six-factor structure was tested by confirmatory factor analysis, and the fit indices of the scale ($\chi^2/df = 710.5/251 = 2.83$; GFI = 0.929, CFI = 0.971, TLI = 0.962, RMSEA = 0.049) were calculated. Within the scope of the scale's reliability studies, the Cronbach's alpha internal consistency coefficient was calculated, and it was found that the coefficients for the scale's dimensions ranged between 0.92 and 0.87.

With the data collected within the scope of this study, the six-factor structure of the scale was tested by confirmatory factor analysis, and the fit indices of the scale ($\chi^2/df = 819.4/194 = 4.22$; SRMR = 0.073, CFI = 0.914, TLI = 0.897, RMSEA = 0.085) were calculated. It was found that the correlation values of the factors of the scale ranged between 0.65 and 0.41. Within the scope of the reliability studies of the scale, the Cronbach's alpha coefficients of the factors were found to be .92 for the coping/escape sub-dimension, .94 for the fun sub-dimension, .86 for the fantasy sub-dimension, .90 for the skill development sub-dimension, .85 for the social sub-dimension, .87 for the competition sub-dimension, and .97 for the total scale.

Digital Game Addiction Scale for University Students: It was developed by Hazar and Hazar (2019). The scale consists of 21 items scored on a 5-point Likert scale and three factors (hyper-focus and procrastination; conflict, deprivation, and seeking; and emotion change and immersion). The lowest score from the scale is "21," and the highest is "105." In the scale scoring, "1 – 21: Normal group, 22 – 42: Low-risk group, 43 – 63: Risky group, 64 – 84: Dependent group, 85 – 105: Highly dependent group." Exploratory and confirmatory factor analyses were conducted to establish construct validity. The Kaiser – Mayer – Olkin (KMO) coefficient and Bartlett's Test of Sphericity were performed for the suitability of the data for factor analysis, and as a result of the analysis, the KMO value was .91, and Bartlett's Test of Sphericity showed a significance value of $p < .001$. The ability of the items to distinguish between individuals with and without the trait being measured was assessed using an independent t-test on the mean scores of the upper and lower groups, which were determined based on the total scale score. The variance explained by the scale was 59.61%. In the analysis results, it was found that the correlation values of the factors ranged between 0.58 and 0.75. According to the results of the analysis, the fit values of the scale ($\chi^2/sd = 398/186 = 2.14$, RMSEA = 0.08, GFI = 0.80, AGFI = 0.76, CFI = 0.89, IFI = 0.89, PGFI = 0.65, and PNFI = 0.73) were calculated. Within the scope of the reliability studies of the scale, the Cronbach's alpha coefficients of the factors were .76 for the first sub-factor, .78 for the second sub-factor, .89 for the third sub-factor, and .95 for the total scale.

With the data collected within the scope of this study, the three-factor structure of the scale was tested by confirmatory factor analysis, and it was found that the scale had good fit indices ($\chi^2/df = 1139/186 = 6.12$; SRMR = 0.072, CFI = 0.832, TLI = 0.811, RMSEA = 0.107), and the covariance values of the factors of the scale ranged between 0.89 and 0.75. Within the scope of the reliability studies of the scale, the Cronbach's alpha coefficients of the factors were found to be .90 for the first sub-factor, .89 for the second sub-factor, .79 for the third sub-factor, and .95 for the total scale.

Online Prosocial Behavior Scale (OPBS): It was developed by Erreygers et al. (2018). In the original form of the scale, there are two dimensions (implemented prosocial behavior and experienced prosocial behavior) and a total of twenty items, ten items in each dimension. The scale items are scored on a 5-point Likert scale. According to the results of the exploratory factor analysis conducted in the development study of the original scale, the factor loadings of the items ranged from .51 to .88. Confirmatory factor analysis revealed that the two-factor structure had a good fit ($\chi^2(155) = 1603.92$, $p < .001$; CFI = .973; TLI = .966; RMSEA = .073).

The Turkish adaptation of the OPBS was conducted by Keskinkılıç (2023). Confirmatory factor analysis conducted within the scope of the study indicated that the scale had good fit indices ($\chi^2(169) = 239.858$, $p < .001$; CFI = .993; TLI = .992; RMSEA = .034). The factor loadings of the scale ranged between .52 and .83, and the correlation between the factors was .79. Cronbach's alpha internal consistency coefficient was calculated as .90 for the applied prosocial behavior dimension, .92 for the perceived prosocial behavior dimension, and .94 for the total scale.

Within the scope of the reliability studies of the scale with the data collected within the scope of this study, the Cronbach's alpha internal consistency coefficient of the factors was calculated as .89 for the applied prosocial behavior dimension, .91 for the perceived prosocial behavior dimension, and .94 for the total scale.

Data Analysis

Spearman Rank Difference Correlation analysis was used to examine the relationships between the variables. Additionally, the multiple linear regression analysis method was employed to test whether gaming motivations and gaming addiction predict online prosocial behaviors.

Process Path

After obtaining permission from the authors who developed or adapted the scales used in the study, Ethics Committee of Bartın University (Approval No.: 2022-SBB-0486; Date: 10.11.2022) granted approval. Following the distance education measures implemented after the February 6, 2023, Kahramanmaraş Earthquake in Türkiye, the data collection process was carried out online. The Personal Information Form, Digital Gaming Motivation Scale, Digital Gaming Addiction Scale for University Students, OPBS, and Informed Consent Form used in the study were transferred to an online platform (Google Forms) by the researcher. The online form was then shared with university students via social media and instant messaging applications.

Results

The correlation values between the predicted and the predictor variables are presented in Figure 1.

As observed in Figure 1, the relationship between online prosocial behaviors, the predicted variable of the study, and each motivation to play online games is positive and statistically significant ($p < .05$). The relationship between online prosocial behaviors and gaming addiction is not statistically significant ($p > .05$). When the relationships between all predictor variables are examined, it is found that Spearman's Rank Difference Correlation Coefficients (ρ) vary between $-.02$ and $.27$. The significant and strongest relationships are between online prosocial behaviors and skill development motivation ($\rho = .27$) and social motivation ($\rho = .27$). The lowest and most significant relationship is between online prosocial behaviors and fantasy motivation ($\rho = .11$).

The results of the multiple linear regression analysis, including standardized regression coefficients, unstandardized regression coefficients, and partial correlation values, for predicting online prosocial behaviors based on online game playing motivation and gaming addiction among university students, are provided in Table 1.

As presented in Table 1, the seven predictor variables in the model explain 11% of the total variance in online prosocial behaviors. Among the online gaming motivations tested in the model, skill development motivation and social motivation variables are

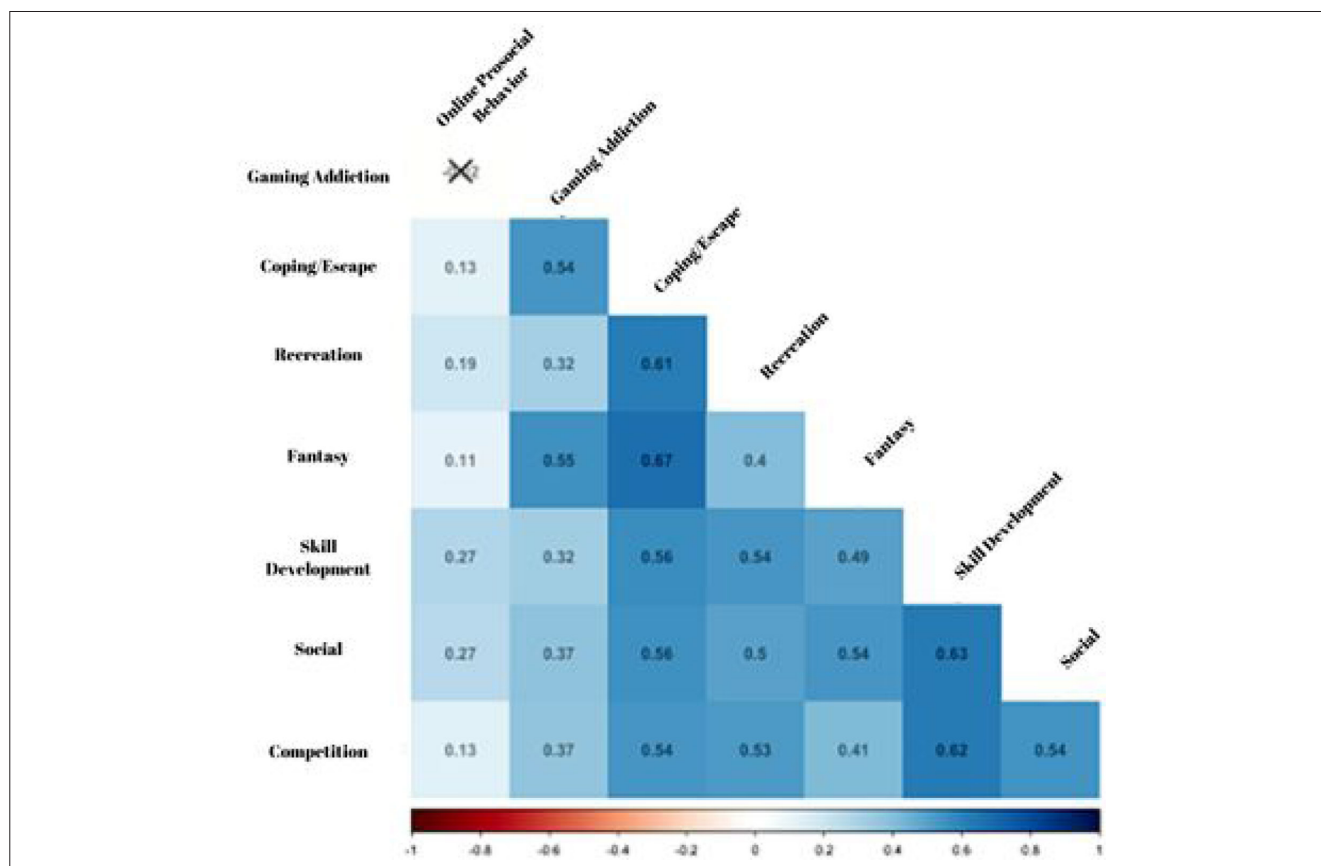


Figure 1. Correlation Values for Online Prosocial Behaviors.

Table 1.
Multiple Linear Regression Analysis Results for Predicting Online Prosocial Behaviors

Predictors	Estimation	Std. Error	t	p	β
Intersection	29.522	1.379	21.416	<.001	
Gaming addiction	-0.04	0.024	-1.656	.098	-0.093
Coping/Escape motivation	-0.048	0.069	-0.693	.489	-0.052
Recreation motivation	0.100	0.143	0.702	.483	0.045
Fantasy motivation	0.003	0.105	0.029	.977	0.002
Skill development motivation	0.313	0.102	3.077	.002	0.206
Social motivation	0.417	0.108	3.846	<.001	0.243
Competition motivation	-0.135	0.103	-1.318	.188	-0.083

$R = 0.337$; $R^2 = 0.113$; $F = 8.007$; $p < .001$.

statistically significant predictors of online prosocial behavior ($p < .001$). Other online gaming motivations (coping/escape, recreation, fantasy, competition) and gaming addiction variables tested in the model are not statistically significant predictors ($p > .05$).

In this study, which tested the ability of university students' online gaming motivations and gaming addiction to predict online prosocial behaviors, it was found that skill development motivation was the most effective predictor. Specifically, as skill development motivation and social motivation increased, online prosocial behaviors also increased.

Discussion

The study's findings revealed that social and skill development motivations for playing games predicted university students' online prosocial behaviors. However, gaming addiction and coping/escape, recreation, fantasy, and competition motivations were not found to be predictors of online prosocial behaviors.

One of the variables considered as a predictor of online prosocial behaviors within the scope of the research is gaming addiction. As a result of the analyses, it is seen that gaming addiction does not significantly predict online prosocial behaviors. This finding contributes to a body of literature with mixed results; while some studies report no significant relationship, others have found a negative association (Boxer et al., 2015; Collins & Freeman, 2013; Lemmens et al., 2015; Yaghoobi, 2022). The complex and non-significant relationship found in this study may be explained by several contextual factors that were not measured. For instance, the type of game played is a critical moderator. Players in highly competitive games (e.g., LoL, Valorant, which were popular among the participants) may need to engage in cooperative, prosocial behaviors within their teams to succeed, regardless of their level of addiction. Conversely, the isolating nature of addiction might suppress prosocial tendencies in other contexts. Therefore, the relationship between gaming addiction and prosocial behavior is likely not linear but is moderated by in-game social demands, game genre, and whether the prosocial behavior is directed at teammates or opponents. In fact, a recent meta-analysis reinforces this complexity, suggesting that prosocial behaviors in games are predicted by a wide array of factors, including empathy and social norms, rather than simply the absence or presence

of addictive patterns (Li et al., 2023). This supports the finding that gaming addiction, as a standalone variable, may not be a direct predictor of these nuanced social interactions. Therefore, future research should aim to disentangle these effects by analyzing specific game contexts and player roles.

The relationship between prosocial behaviors and gaming addiction is complex. This complexity may stem from the fact that prosocial behaviors center on individuals and human interactions (Erreygers et al., 2018), while addiction itself is a complex phenomenon (Türkiye Yeşilay Cemiyeti, 2023). Therefore, prosocial behaviors and gaming addiction are comprehensive and dimensional concepts, and the relationship between them may vary depending on which dimensions are measured. Further studies are needed on these topics.

In a meta-analysis study, Ferguson (2007) found that online games do not positively or negatively affect individuals' social and emotional characteristics, including prosocial behavior. Accordingly, similar to the results of this study, gaming addiction is not seen as a predictor of prosocial behavior. Considering that the type of game played affects individuals' social behaviors (Dowsett & Jackson, 2019; Jerabeck & Ferguson, 2013), the inclusion of students who played both cooperative and competitive games in this study may have contributed to this finding. Collins and Freeman (2013) argue that individuals who play competitive online games should be in social environments within the game, which may affect their prosocial behaviors. Regardless of whether they are addicted, individuals may need to exhibit prosocial behaviors to achieve various gains in the game. This may explain why gaming addiction was not found to be associated with online prosocial behavior.

Another variable that was considered a predictor of online prosocial behaviors within the scope of the study was online gaming motivations. The analysis of this study indicates that social motivation and skill development motivation, which are among the motivations for playing online games, significantly predict online prosocial behaviors. This finding is in line with the studies in literature (Halbrook et al., 2019). Considering that social motivation means motivation to chat with other players and make friends (Evren et al., 2020; Yee, 2006a, 2006b), it can be said that students who play games with this motivation will pay more attention to their social skills and may be more prone to

show prosocial behavior. This finding aligns with recent studies indicating that motivations centered on social interaction are significantly linked to greater perceptions of social support and well-being within online gaming communities (Wüthrich et al., 2024). Skill development motivation is the development of coordination, concentration, and other skills (Evren et al., 2020). Since students who play games with this motivation tend to focus on themselves rather than others and aim to enhance their social skills, skill development motivation may be associated with online prosocial behaviors.

Limitations and Future Directions

Several limitations of this study should be acknowledged, which also provide avenues for future research. First, the use of a convenience sampling method limits the generalizability of the findings to the broader population of university students in Türkiye. The demographic profile of this sample, primarily from the Western Black Sea region, may not be representative of all student gamers in the country. Future studies should employ stratified or random sampling techniques to obtain a more diverse and representative sample.

Second, the regression model explained 11% of the variance in online prosocial behavior. While these findings identify gaming motivations as significant predictors, this modest R^2 value indicates that other factors not included in this model play a substantial role. Future research could explore other variables such as personality traits (e.g., agreeableness, empathy), moral identity, and specific in-game social network dynamics to build a more comprehensive predictive model.

Third, this study utilized a cross-sectional design, which captures data at a single point in time. Consequently, it is not possible to infer causality from these results. The relationships identified are correlational, and one cannot determine whether motivations lead to prosocial behaviors or if engaging in prosocial behaviors enhances certain gaming motivations. Longitudinal studies are needed to track these variables over time and establish the directionality of these relationships.

Finally, while this study provides valuable insights, it did not deeply analyze the cultural context. Gaming habits and the importance of social connections can vary across cultures. Future studies could conduct cross-cultural comparisons to investigate how the relationship between gaming motivations and prosocial behaviors differs, particularly considering the collectivist aspects of Turkish culture that might place a higher value on in-group social harmony, even in competitive online environments.

When the findings obtained in line with the study's objectives are examined, it is found that the variables explain 11% of the total variance in online prosocial behaviors in the model. Among the motivations for playing online games, skill development motivation and social motivation significantly predict online prosocial behaviors, while other motivations for playing online games (coping/escape, recreation, fantasy, competition) and gaming addiction do not significantly predict online prosocial behaviors. It is observed that social motivation is the strongest predictor of university students' online prosocial behaviors.

Based on the results, several recommendations can be made for researchers and practitioners. More studies are needed to

examine the multifaceted relationship between prosocial behavior, gaming addiction, and game motivations. Future research should also expand to different age demographics, such as middle and late adulthood, to understand the lifelong impact of gaming, and incorporate diverse cultural groups to enhance the applicability of findings.

From a practical standpoint, the current findings suggest that a player's underlying motivation is more indicative of their social behavior than their level of addiction. This has important implications for interventions. For instance, university counselors and mental health professionals could use motivational profiles to identify students who play games to fulfill social needs and guide them toward positive in-game communities. Furthermore, educational programs could be designed to leverage the skill development motivation by framing cooperative gameplay as a method for improving valuable soft skills like communication, teamwork, and strategic thinking. Game developers could also use these insights to design features that reward and encourage prosocial interactions, thereby fostering healthier and more supportive online environments.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Bartın University (Approval No.: 2022-SBB-0486; Date: 10.11.2022).

Informed Consent: Written informed consent was obtained from the participants who agreed to take part in the study.

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ORIGINAL ARTICLE

Explaining Psychological Theories and Constructs Affecting Problematic Social Media Use in Turkish University Students from a Motivational Perspective

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Main Points

- According to the motivational approach, Self-Determination Theory and personal fear of missing out were found to be more important theories and constructs in explaining social media and problematic social media use.
- As time spent on social media sites increases, social media and problematic social media use also tend to increase.
- Another motivation for using social media sites is entertainment.

Abstract

One of the most prominent behaviors among online activities performed on smartphones is social media use. In this study, problematic social media use of Turkish university students was explained from a motivational perspective by utilizing self-determination theory, uses and gratifications theory, and belongingness theories. Data were collected from 349 Turkish university students aged 18 and over. WhatsApp, YouTube, and Instagram are very popular among Turkish university students, with more than 90% of students using these platforms in their daily lives. When the relationship between the main variables used in the study is examined, it is seen that the strongest connection of Social Media Addiction Scale is with personal fear of missing out ($r = 0.62, p < .01$). Time spent on social media is also moderately and significantly related with Social Media Addiction Scale ($r = 0.46, p < .01$). Another variable with a moderately significant relationship with the Social Media Addiction Scale is entertainment ($r = 0.41, p < .01$). Social media usage time, personal fear of missing out, and entertainment motivations together significantly explained 46% of the variance in the Social Media Addiction Scale, with personal fear of missing out making the largest contribution to this prediction ($\beta = .45, p < .001$).

Keywords: Addiction, health psychology, media psychology, motivation, social media use

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Introduction

One of the most prominent behaviors among online activities performed on smartphones is social media use. Since social media use is increasing in Türkiye and other countries, the possible reasons for this behavior have attracted the attention of psychologists more and more every day. However, the relationship between excessive use of social media and psychological problems also attracts the attention of researchers.

Excessive and uncontrolled use of social media can lead to a condition known as social media addiction (Kalınkara & Talan, 2025). It was claimed that excessive and uncontrolled use of social media has a similar mechanism to substance addiction and was sometimes associated with the concept of “addiction,” and sometimes it was characterized as problematic use and found to have negative psychological consequences (Smith, 2023).

Problematic use of social media can also be addressed outside the perspective of neurobiological

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addiction or disease. These perspectives include the dispositional difference perspective, motivational perspective, decision-making perspective, and learning perspective (Sun & Zhang, 2021). Identifying the underlying reasons that motivate social media use will significantly contribute to preventing excessive social media use. Therefore, it is necessary to determine the factors that motivate the excessive use of this type of media among Turkish university students.

In this study, Turkish university students' problematic social media usage motivations were investigated. The first aim of this study is to try to explain social media use and problematic use from a motivational perspective. Within the scope of this study, self-determination theory, uses and gratifications theory, and belongingness theory were utilized to explain social media use in the context of a motivational perspective. The second aim is to understand the risk of problematic social media use by determining which social media sites Turkish university students use and how long they use them in their daily lives. To the authors' knowledge, studies examining social media use and problematic social media use according to a motivational perspective only included certain constructs and theories. Such studies have only concerned a motivational perspective in a narrow context and were considered insufficient to explain the relationship between the motivational perspective and problematic social media use. This study brings together many constructs and theories from a motivational approach, making a unique contribution to the existing body of knowledge.

Social Media Addiction or Problematic Social Media Use

Social media sites are internet-connected applications that allow individuals to express their thoughts by sharing videos, photos, or messages with a specific person, group, or all internet users. Social media, which first started with the launch of Facebook in 2004, has rapidly become popular and constituted an important part of the interaction between individuals.

As a result of continuous access to the internet through smartphones, individuals have found the opportunity to carry the internet with them, and social media use has become easier. Although problematic use of social media has not been defined by the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013) as an addiction, social media addiction tends to be defined or described in the literature in the context of the following 6 dimensions: psychological mood change, salience, tolerance, withdrawal symptoms, conflict, and relapse (Fabris et al., 2024).

Long-term use of social media has been considered an important variable in social media studies and is often associated with behavioral addiction or other problems (Bottaro & Faraci, 2022). In addition, increased exposure to visual content on social media may lead to greater social comparison and reinforcement of concerns about appearance (Boursier et al., 2020).

Problematic Social Media Use According to Motivational Approach

The motivational approach treats the individual as more active and claims that media use fulfills specific needs or that the individual using social media has clear goals (Sun & Zhang, 2021). In line with this view, some researchers have suggested that overuse

of social media sites results from a need-fulfilling mechanism (Montag et al., 2021; Wang et al., 2015). According to the motivational approach, there may be many reasons why individuals use social media. This approach argues that individuals can be motivated to use social media to meet their needs for self-presentation, information, entertainment, socialization, communication and interaction, online social support, flow, belonging, escape, independence, and competence (Sun & Zhang, 2021).

The following sub-sections introduce the theories and constructs from the motivational perspective that were considered in this study. This study draws upon three prominent theories to understand problematic use of social media sites. These theories can be stated as "uses and gratifications theory", "self-determination theory," and "belongingness theory." Within the scope of the uses and gratifications theory, the constructs of self-presentation, entertainment, communication, social gratification, and informational motives were addressed in this study. While the fear of missing out (FoMO) motive was handled within the framework of self-determination theory, the general belonging motive was examined using belongingness theory.

Belongingness Theory and Social Media Use

The need to belong is defined as "a pervasive drive to establish and maintain at least minimally lasting, positive and meaningful interpersonal relationships" (Baumeister & Leary, 1995). It has been reported that the need to belong is much more than a simple need for affiliation. Frequent contact with unsupportive, uncaring individuals will do little to meet the need for belonging, and relationships lacking regular contact will also fail to meet this need (Baumeister & Leary, 1995).

Social media offers important opportunities for adolescents and young people's social functioning, allowing them to stay in touch with groups of friends more easily or to build new relationships on the Web (Fabris et al., 2024). Relationships built through social media can have an impact on an individual's overall sense of belonging. Likes, followers, and interactions through social media can give individuals the experience of belonging to a community. At a time when one is always online and connected, it has been reported that feeling ignored or excluded online can pose a serious threat to basic human needs such as belonging, self-esteem, control, and meaningful existence (Schneider et al., 2017). To give an example of the relationship between the sense of belonging and social media addiction, a significant and negative correlation was found between general belongingness and smartphone addiction among Northern Cyprus higher education students (Babayigit et al., 2023).

Self-Determination Theory and Social Media Use

According to self-determination theory, human behavior is driven by two main motivations, intrinsic and extrinsic, to satisfy some psychological needs. These needs are specified as competence, autonomy, and relatedness (Ryan & Deci, 2000). It has been argued that self-determination theory, which attempts to explain human motivation, provides a useful perspective for understanding the empirical basis of FoMO (Przybylski et al., 2013). Fear of missing out is described as an individual's persistent clinging to what others have done out of fear that others may have more satisfying and rewarding experiences than themselves (Gezgin & Kurtça, 2023). Based on self-determination theory, Przybylski

et al. (2013) predicted that FoMO may play a role as a tool linking deficits in psychological needs to social media engagement.

It was emphasized that FoMO should be perceived as a multidimensional phenomenon, not as a general construct (Alt, 2015). Since the concept of self includes the private and public self, it has been suggested that FoMO has two dimensions: personal FoMO and social FoMO, and related academic studies supported this claim (Suarez-Perdomo et al., 2024; Zhang et al., 2020). Personal FoMO has been reported to be people's anxiety about missing out on experiences they want for themselves, while social FoMO is people's anxiety about missing out on experiences others enjoy (Zhang et al., 2020). Many studies have highlighted the direct or indirect relationship between this psychological construct and problematic social media use. For example, a study by Throuvala et al. (2019) found that the control motive in the context of social media is reinforced by FoMO and can lead to problematic use of social media sites.

Uses and Gratification Theory and Social Media Use

This theory addresses five social factors that may lead to the emergence of media-related needs: reducing tension and conflict, information for solving problems, meeting needs not found in real life, reinforcing values, and providing information necessary to maintain group membership (Katz et al., 1973 – 1974). To illustrate the theory's explanation, users with a high need for appearance-related satisfaction may be more likely to prefer to use one or more image-oriented social media platforms such as Instagram (Van Oosten et al., 2023). In a study using this theory, technology gratification had the greatest impact on intention to continue using WeChat in China (Gang & Li, 2018). Uses and gratifications theory addresses in this study self-presentation, entertainment, communication, social satisfaction, and informational motives.

Self-presentation is one of the important psychological constructs within the scope of uses and gratifications theory. It has been reported that self-presentation refers to the process by which individuals strategically convey an image of themselves to others (Baumeister, 1982). Social media features enable individuals to realize their self-presentation by allowing them to express their interests, opinions, and beliefs about themselves (Torres, 2024). Social media also offers a variety of interaction and self-presentation features, accompanied by positive feedback from other users (Brailovskaia et al., 2023). According to the researchers, individuals with a strong need for approval reported higher levels of false self-presentation (Mun & Kim, 2021). A related study found that the majority of participants were not always honest about their personality, non-useful information, and emotional state on Facebook (Möller et al., 2022).

In this study, “uses and gratifications theory”, “self-determination theory,” “belongingness theories,” and psychological constructs related to these theories, which are evaluated within the scope of the motivation perspective and are considered to be closely related to social media overuse, were included. The reason for selecting these motivational theories is that these theories and related constructs have been reported to be closely related to social media use and overuse (Sun & Zhang, 2021). The research questions of this study are listed below.

RQ1: From a motivational perspective, what are the motivations behind university students' use of social media or problematic social media in Türkiye?

RQ2: Which social media sites do Turkish university students use in their daily lives and for how long?

Material and Methods

Participants

In line with the aims of the study and to answer the research questions, data were collected between February and March 2025 from university students over the age of 18 who declared that they had a social media account. Using a priori analysis with G*Power (version 3.1) software (Faul et al., 2009), it was determined that a minimum of 184 participants was needed. Parameters for the variables were set at a level of 0.05, 1- β of .95, and a medium effect size. Because larger samples would increase statistical power and reduce the risk of type 2 error, data collection from volunteer participants continued until the end of March 2025. Since the total sample size was 349 participants, the sample population was considered sufficiently representative. Three hundred forty-nine university students from various departments were informed about the purpose of the study, its scientific content, and the conditions for conducting the survey anonymously. After the voluntary participation form and informed consent of the participants, students were presented with an online self-report questionnaire consisting of a personal information form, Bergen Social Media Addiction Scale, Belongingness Scale, FoMO Scale, Social Media Self-Presentation Scale, and Social Media Use Purposes Scale.

Demographic characteristics of the participants are presented in Table 1. Although the ages of the students who participated in the study ranged between 18 and 48, 87% of them were between the ages of 18 – 24. Overall, 311 of the participants claimed that they were currently studying in a social or humanities field, 14 students stated that they were studying in engineering or science, and 24 students reported that they were studying in health sciences.

Table 1.
Demographic Characteristics of Participants

	N	%
Gender	260	74.5
Female		
Male	89	25.5
Class		
1st grade	80	23
2nd grade	87	25
3rd grade	75	21.5
4th grade	107	30.5
	X ⁻	SD
Age, years	22.3	4.35

Note: X⁻ = Mean, SD = Standard deviation.

Measurement Instruments

Personal Information Form: It was created by the researcher to examine the demographic characteristics of the participants such as age and gender. Participants were also asked about their approximate usage of social media sites in the last 6 months. The average duration of use of social media sites was asked in the contexts of “less than 2 hours, 2 – 4 hours, 4 – 6 hours, and more than 6 hours of use” per day, respectively. Students were asked to indicate which of the social media sites WhatsApp, Instagram, YouTube, Pinterest, Facebook, TikTok, X, Snapchat, LinkedIn, Telegram they use.

Bergen Social Media Addiction Scale: The Bergen Social Media Addiction Scale developed by Andreassen et al. (2016) consists of 6 items. The scale is answered according to a 5-point Likert-type scale. The internal consistency of the original scale was found to be 0.88. The Turkish validity study of the scale was conducted by Demirci (2019), and the exploratory factor analysis showed that the scale had a one-dimensional structure as in the original scale. The internal consistency reliability coefficient of the scale was found to be between .80 and .84 in different sample groups (Andreassen et al., 2016). In this study, the Cronbach’s alpha internal consistency coefficient is 0.83 for the scale.

Fear of Missing Out (FoMO) Scale: Zhang et al., (2020) associated FoMO with the self and emphasized that FoMO should be evaluated as two factors, personal and social, as in self-perception theory. Zhang et al. (2020), who developed the scale conducted four studies to test the validity and reliability of the FoMO scale consisting of nine items and reported that the scale has a two-factor structure and has sufficient validity and reliability values. The scale is answered according to a 7-point Likert-type scale. The adaptation of the scale to Turkish was carried out by Çelik and Özkara (2022), and according to the results of confirmatory factor analysis, the two-factor structure of the scale was confirmed. As a result of the analyses conducted with the data collected from the two samples, it was determined that the alpha internal consistency was between .85 and .90. Cronbach alpha was obtained as 0.93 for personal FoMO and 0.94 for social FoMO in this study.

Belongingness Scale: The Scale developed by Ersanlı and Koçyiğit (2013) is a three-dimensional scale including belonging to family, friends, and occupation. The scale consisting of 22 items is answered according to a 5-point Likert-type scale. As a result of the reliability analysis, Cronbach’s α values of .88, .89, and .88 were obtained for the family, friend group, and occupation factors, respectively, and .90 for the whole scale. The psychometric properties of the Belongingness Scale supported that it is a valid and reliable scale to be used in determining the belonging level of university students (Ersanlı & Koçyiğit, 2013). In this study, Cronbach’s α was found to be 0.87 for friendship and 0.91 for family and professional belonging.

Social Media Self-Presentation Scale: The scale was adapted into Turkish from a study conducted by Michikyan et al. (2015). The original scale is a 5-point Likert-type scale consisting of three main dimensions: the real self, the ideal self, and the false self. The validity and reliability studies were carried out by Avcı and Hazar (2024). In order to reveal the factor structure of the scale, exploratory factor analysis was applied and the scale was

reduced to 12 items and grouped into two sub-dimensions (False Self-Presentation and True Self-Presentation). The overall internal consistency of the scale was 0.76 and the overall test-retest reliability was 0.79. In this study, the Cronbach α was found to be 0.80 for false self-presentation and 0.69 for true self-presentation.

Social Media Use Purposes Scale: The scale developed by Aras and Peker (2021) to determine the social media usage purposes of university students is a 5-point Likert-type scale consisting of 17 items and 4 sub-dimensions. In the criterion-related validity study, positive relationships were found between the four sub-dimensions of the scale and the Bergen Social Media Addiction Scale. The Cronbach’s α for the whole scale was .88, while its sub-dimensions were .77 for communicating, .75 for social satisfaction, .86 for entertainment, and .81 for obtaining information. In this study, Cronbach’s α was found to be 0.82 for entertainment and communication, 0.83 for social satisfaction, and 0.84 for information motivation.

Process

This research is a cross-sectional study, and the participants were selected among university students on a voluntary basis and by convenience sampling method. Before starting the study, permission was obtained from the Zonguldak Bülent Ecevit University Ethics Committee with the date January 2, 2025 and protocol number 974. In the first stage, data were collected from 351 participants. Since the kurtosis value of the entertainment subscale was found to be above 2, two extreme values were excluded from the calculation, and then it was observed that the kurtosis value of the entertainment subscale decreased below the threshold level of 2. Descriptive, Pearson correlation, and multiple linear regression analyses were applied to the data of the remaining 349 participants using the SPSS-26 (IBM SPSS Corp.; Armonk, NY, USA) statistical package program.

Results

Below, frequently used social media sites and rates of usage (Figure 1), descriptive analysis of the main variables (Table 2), relationships between main variables, age, and usage time (Table 3), and the regression analysis showing the effects of main motivational variables and usage time on the problematic use of social media (Table 4) are analyzed respectively. Among the demographic questions, which social media sites students prefer and their average usage time were deemed important. Descriptive characteristics of the main variables and their sub-components are given in Table 2.

Descriptive analysis shows that WhatsApp, YouTube, and Instagram are very popular among Turkish university students, with more than 90% of students using these platforms in their daily lives. X, Pinterest, Snapchat, and TikTok are preferred by some students, while LinkedIn, Telegram, and Facebook are among the social media platforms preferred by very few students (Figure 1).

The average daily use of social media by university students can provide important information about their risk of problematic use or addiction. Researchers tend to consider the use of digital instruments above an average of 4 hours per day as a risk of addiction or problematic use (Sánchez-Fernández et al., 2023). The results showed that 49.3% ($N = 172$) of all participants in this

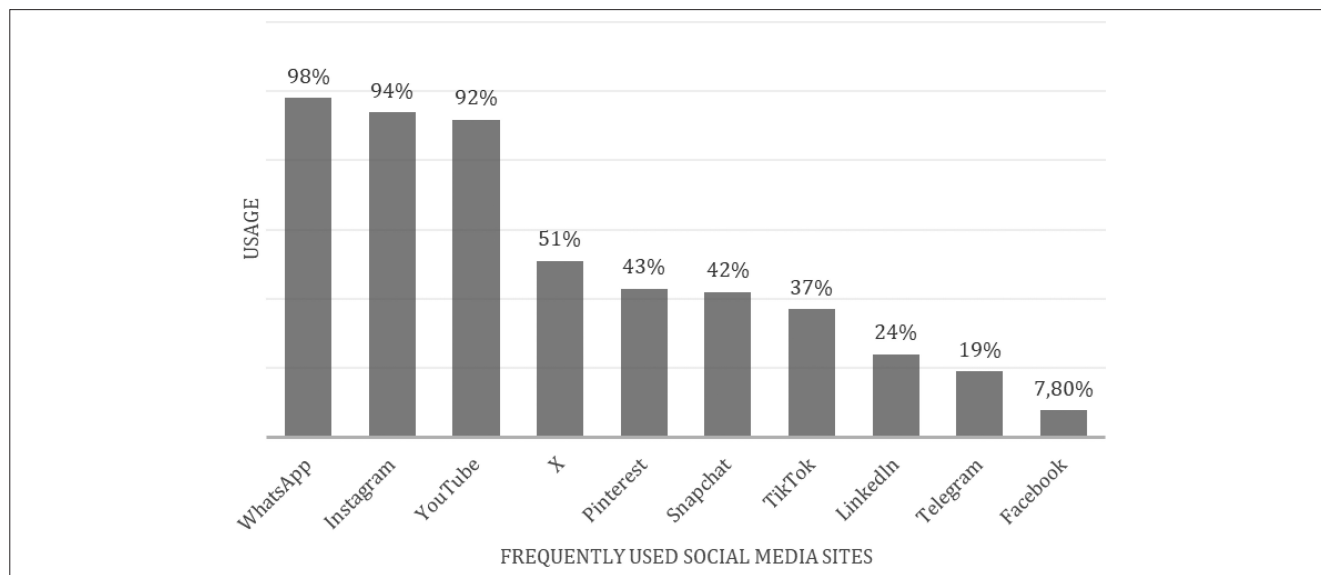


Figure 1. Frequently Used Social Media Sites and Rates of Usage.

study could be categorized as potential problematic social media users. This rate could indicate that about half of the respondents use social media problematically.

When the relationship between the main variables used in the study is examined (Table 3), it is seen that the strongest connection of Social Media Addiction Scale is with personal FoMO ($r = 0.62, p < .01$). It can be said that as participants' social media addiction or problematic use increases, their personal FoMO on social media development tends to increase. Personal FoMO on

social media updates will similarly increase participants' problematic use of social media. It is seen that the time spent on social media is also moderately and significantly related with Social Media Addiction Scale ($r = 0.46, p < .01$). Time spent on social media increases problematic social media use or problematic use increases time spent on social media. Another variable with a moderately significant relationship with the Social Media Addiction Scale is entertainment, one of the sub-components of the Social Media Usage Purposes Scale ($r = 0.41, p < .01$). People who need entertainment turn to social media and tend to satisfy these unsatisfied needs through social media as long as they use it.

Table 2.
Descriptive Characteristics of the Variables

Scale	X ⁻	SD	Average Values
Social media addiction	17.99	5.09	6 – 30
Social media self-presentation			
True self	17.68	3.35	5 – 25
False self	15.37	4.78	7 – 28
Belongingness			
Friends	27.85	4.82	7 – 35
Family	24.23	4.73	6 – 30
Occupation	34.65	7	9 – 45
FoMO			
Personal	14.3	7.56	5 – 35
Social	8.67	5.5	4 – 28
Social media uses and purposes			
Entertainment	16.67	3.49	5 – 25
Social satisfaction	14.25	3	5 – 25
Informational motives	15.43	2.78	4 – 20
Communication	10.26	2.65	3 – 15

X⁻ = Mean, FoMO = Fear of missing out; SD = Standard deviation.

Fear of missing out sub-components were also found to have significant associations with some other variables. Relationship between personal FoMO and the false self-presentation sub-component of the Social Media Self-Presentation Scale was found to be moderate and significant ($r = 0.46, p < .01$). Furthermore, personal FoMO was significantly and moderately related to the social satisfaction sub-component of the Social Media Uses and Purposes Scale ($r = 0.41, p < .01$). On the other hand, social FoMO was moderately and significantly correlated with the false self-presentation ($r = 0.45, p < .01$) and the Social Media Addiction Scale ($r = 0.36, p < .01$).

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Multiple linear regression analysis was applied to understand which basic motivational variables predicted social media

Table 3.
Relationships Between Main Variables, Age, and Usage Time

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Age	-													
2. Usage time	-.12	-												
3. Social media addiction	-.09	.46**	-											
4. True self-presentation	.09	.06	.08	-										
5. False self-presentation	-.01	.12*	.35**	.01	-									
6. Belonging to friends	.05	-.01	-.07	.15**	-.19**	-								
7. Belonging to family	.01	-.13*	-.17**	.09	-.19**	.59**	-							
8. Belonging to occupation	.07	-.19**	-.13*	.24**	-.17**	.41**	.36**	-						
9. Personal FoMO	-.06	.33**	-.06	.62**	.05	.46**	-.15**	-.20**	-.09	-				
10. Social FoMO	-.05	.16**	-.05	.36**	-.12*	.45**	-.26**	-.23**	-.20**	.62**	-			
11. Entertainment	-.06	.26**	-.06	.41**	.29**	.23**	-.02	-.12*	.01	.40**	.12*	-		
12. Social satisfaction	-.04	.14**	-.04	.31**	.23**	.31**	-.04	-.17**	-.03	.41**	.25**	.63**	-	
13. Information	.01	.25**	.01	.15**	.39**	-.01	.19**	.12*	.17**	.05	-.17**	.51**	.28**	-
14. Communication	-.12*	.08	-.12*	.14*	.29**	.12*	.09	-.04	.03	.04	-.03	.44**	.57**	.43**

FoMO = Fear of missing out.

* $p < .05$.

** $p < .01$.

Table 4.
The Effect of Main Motivational Variables and Usage Time on Problematic Use of Social Media

Variables	B	β	SD	t	p
Constant	5.46		2.10	2.61	.009
UT	1.51	.25	.27	5.67	.000
FoMO_P	.30	.45	.04	7.50	.000
FoMO_S	.00	.00	.05	.03	.98
EM	.26	.18	.09	3.02	.003
SSM	-.10	-.08	.08	-1.25	.21
IM	-.05	-.03	.10	-.49	.62
CM	.11	.06	.10	1.08	.28
TSP	.00	.00	.07	-.00	.10
FSP	.09	.08	.05	1.77	.08
B_Frn	.05	.05	.05	.98	.33
B_Fam	-.05	-.04	.05	-.84	.40
B_Occ	-.02	-.03	.03	-.67	.50

Note: B_Fam = Belongingness to family; B_Frn = Belongingness to friends; B_Occ = Belongingness to occupation; CM = Communication motivation; EM = Entertainment motivation; FSP = False self-presentation; FoMO_P = Personal FoMO; IM = Information motivation; SD = Standard deviation; FoMO_S = Social FoMO; SSM = Social satisfaction motivation; TSP = True self-presentation; UT = Usage time.

addiction or problematic use of social media, and in this analysis, Bergen Social Media Addiction Scale was considered as the dependent variable (Table 4). The model was found significant, $F(12, 336) = 26.03, p < .001$. Social media usage time, personal FoMO, and EMs together significantly explained 46% of the variance in the Social Media Addiction Scale, with personal FoMO making the largest contribution to this prediction ($\beta = .45, p < .001$). A rise in personal FoMO leads to an increase in problematic social media use. Similarly, problematic social media use increases personal FoMO. The second most important variable in terms of predictive power was social media usage time, and it was determined that time spent on media positively predicted problematic social media use and this behavior increased problematic social media use ($\beta = .25, p < .001$). Third variable in terms of predictive power was entertainment, and this variable also predicted problematic social media use positively and significantly. It was determined that participants who wanted to meet their entertainment needs from social media were more motivated to use social media and this behavior ultimately led to problematic social media use ($\beta = .18, p < .001$). The other main variables and their sub-components did not significantly predict problematic social media use (Table 4).

Discussion

The findings provide insight into the key drivers of normative Turkish university students' social media behavior. Among self-presentation, belongingness, FoMO, and social media use purposes, FoMO is the strongest statistical predictor of excessive social media use outcomes. Personal FoMO strongly predicted problematic social media use in these participants. This study is important in terms of revealing that self-determination theory and personal FoMO are more important in explaining social media use from a motivational perspective. Another, though less important, variable that motivates problematic social media use is that students also use social media sites for entertainment purposes.

It has been noted that FoMO can be both a precursor and a consequence of excessive social media use (Çelik & Özkara, 2022). The university students who participated in this study may spend long periods of time on social media sites due to fear of missing updates on social media, or fear of missing updates on social media may occur in students who use social media problematically. Since Przybylski et al. (2013) predicted that individuals reporting high levels of FoMO would have lower levels of satisfaction with basic psychological needs, it can be said that participants who were not sufficiently satisfied with meeting their psychological needs turned to social media sites to meet these needs. The results revealed that participants were not afraid of missing out on experiences that other people enjoyed, but were afraid of missing out on experiences that they wanted only for themselves. Based on this finding, it can be said that respondents tend to follow updates on social media by acting with intrinsic motivation.

Numerous studies have been conducted on FoMO, some of which are summarized below. An experimental study conducted at a university in the USA found that FoMO increased social media use, while limiting social media use led to significant reductions in loneliness and depression (Hunt et al., 2018). A study conducted on adolescents in the Netherlands found that FoMO increased problematic social media use in mid-adolescence, concluding that FoMO could be considered a risk factor for problematic social media use (Li et al., 2024). In another study involving university students in Türkiye, it was found that FoMO was significantly related to social media addiction, and self-control and responsibility played a serial mediating role in this relationship (Kovan et al., 2024). Findings from studies conducted across countries support the idea that FoMO is an important psychological construct motivating social media and problematic social media use. However, other studies have not adequately addressed the personal and social components of FoMO. In other words, most research on this topic has measured FoMO as a general psychological construct rather than as a multidimensional construct. This measurement method applied to FoMO is a feature that distinguishes this study from others.

Among the demographic questions, time spent on social media also emerged as an important variable in predicting problematic social media use. This result is generally consistent with the psychology literature. The use of social media or other digital tools over long periods of time has been recognized as an important variable in social media studies and is often associated with behavioral addiction or other psychological problems (Bottaro & Faraci, 2022; Sánchez-Fernández et al., 2023). Approximately half of the students who participated in the study reported that they were on social media sites for 4 hours or more per day. This is an excessively long period of time in daily life and is one of the important signs of problematic social media use.

Another important finding is that entertainment from the "uses and gratification theory" was found to be an important variable in predicting problematic social media use. The following results were obtained in other countries and cultures on this topic. A study of social media motivations among high school and university students in Sweden found that the most common motivations for social media use were entertainment, social support, knowledge, and skills (Thorell et al., 2024). In another study conducted

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on university students in China, entertainment gratification was found to be the most common motivation in using TikTok (Yang & Ha, 2021).

These results revealed that only some of the constructs and theories used in this study were significant in predicting problematic social media use. Belongingness theory was found to be insignificant in predicting problematic social media use behavior. In addition, self-presentation in social media was found to be insignificant in predicting the outcome variable.

It has been determined that WhatsApp, Instagram, and YouTube are the most preferred social media sites by Turkish university students. YouTube is mostly used by young people to watch TV shows and movies and to search for music videos or other interests instead of typical television viewing (Throuvala et al., 2019). Instagram embodies a unique culture of aesthetic and positively biased self-expression (De Vries et al., 2018). This popular social media site is seen as an idealistic image-sharing, slice-of-life app that provides inspiration for an individual's life activities and interests (Throuvala et al., 2019). WhatsApp is an application that is generally used for messaging. Students can follow the news about school and lessons on this channel, as well as share photos and videos, exchange messages with their friends, and talk to their friends. Based on the functions of these social media platforms, it can be said that university students are motivated to follow others' daily activities and interests, photos, videos, TV programs, movies, music, and school lessons for entertainment purposes and FoMO.

With smartphones becoming accessible to everyone, social media use has become a fundamental behavioral pattern among young people. Approximately 50% of university students in Türkiye spend 4 hours or more a day on social media. This is considered problematic and needs to be changed. Why do young people tend to meet their entertainment needs from the virtual world of social media? And why are young people so interested in the lives of others and so insistent on following their social media posts? These may be two principal questions that psychologists, educators, and politicians need to seek answers to. One answer to this question could be that economic problems in Türkiye limit real-world entertainment for the majority. Introducing individuals to face-to-face activities and hobbies from a younger age, facilitating their learning of literature, art, and exercise, and trying to implement education and training policies that aim to reveal the potential of individuals from an early age may be some of the ways that can replace problematic social media use in general, FoMO, and online entertainment in particular. Considering that young people mostly use Instagram, YouTube, and WhatsApp, what content they are particularly interested in on these social media platforms, what content creates a FoMO in young people, and what entertains young people on these sites may be among the topics that need to be investigated in future studies.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Zonguldak Bülent Ecevit University (Approval No: 974; Date: 02.01.2025)

Informed Consent: Written informed consent was obtained from the participants who agreed to take part in the study.

Peer-review: Externally peer-reviewed.

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A Person-Centered Approach to Social Media Addiction in Adolescents: Latent Profile Analysis of the Sense of Coherence, Cognitive Flexibility, and Emotion Regulation

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Main Points

- This study suggests the protective role of sense of coherence, emotion regulation, and cognitive flexibility.
- Adolescents in the “high resource” profile had the lowest levels of social media addiction, while those in the “low resource” profile had the highest.
- Focusing on strengthening coherence, flexibility, and emotional regulation may be a promising prevention strategy.

Abstract

Social media addiction has become a widespread issue. Consequently, identifying the factors that mitigate social media addiction is of significant importance. The goal of this study was to explore how sense of coherence, cognitive flexibility, and emotion regulation are associated with social media addiction and to examine how profiles based on these variables differ in relation to social media addiction. Data were collected from 415 adolescents (age = 16.36, standard deviation = 1.31), and profiles were identified using latent profile analysis. The analysis revealed three distinct profiles: “high sense of coherence, cognitive flexibility, internal functional and external functional emotion regulation,” “medium sense of coherence, cognitive flexibility, internal functional and external functional emotion regulation,” and “low sense of coherence, cognitive flexibility, internal functional and external functional emotion regulation.” The results indicated that sense of coherence, cognitive flexibility, and emotion regulation were negatively associated with social media addiction. Additionally, the high profile demonstrated lower levels of social media addiction compared to the medium and low profiles, while the medium profile exhibited lower levels of social media addiction than the low profile. These findings suggest that prevention and intervention programs generated by salutogenic theory could play a role in reducing and preventing social media addiction.

Keywords Cognitive flexibility, emotion regulation, sense of coherence, Social media addiction

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Introduction

Over the past 2 decades, the dramatic growth of the internet has made it an integral part of daily life, with social media platforms becoming accessible at all times. As a result, instant sharing of videos and photos on these platforms has progressively increased social media usage (Sun & Zhang, 2021).

Globally, 3.88 billion people use social media platforms such as WhatsApp, Instagram, TikTok, and Facebook (Statista, 2023). Furthermore, the average daily time spent on social media worldwide rose from 147 minutes between 2012 and 2021 to 151 minutes in 2022 (Statista, 2023). Consequently, the overuse and misuse of social media have contributed to the emergence of social media addiction (SMA)



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(Andreassen & Pallesen, 2014). SMA is characterized as the detrimental impact of excessive and uncontrolled use of social media platforms on academic, social, educational, and professional life (Andreassen & Pallesen, 2014). Symptoms of SMA include sudden mood swings (mood change), obsessive preoccupation with social media (salience), the need for increased use to achieve satisfaction (tolerance), restlessness when not using social media (withdrawal), a cycle of quitting and restarting (relapse), and disruptions in daily functioning (conflict) (Griffiths, 2005).

Although SMA poses a risk to individuals of all ages, adolescents are particularly vulnerable (Kuss & Griffiths, 2020). A survey by the Pew Research Center (PRC) revealed that 54% of adolescents exhibit symptoms of SMA (PRC, 2022). The I-PACE model suggests that affect (A) factors, such as emotion dysregulation and mood change, cognition (C) factors, such as cognitive bias and distortion, and execution (E) factors, such as inhibitory control and impulsivity, constitute the three inner circles that trigger SMA (Brand et al., 2019). Moreover, the model proposes that the regulation of affective, cognitive, and executive processes may buffer the risk of SMA. Specifically, strong emotion regulation may protect against affective vulnerabilities, robust cognitive flexibility may reduce the influence of cognitive distortions, and a strong sense of coherence may mitigate executive deficits. Hence, the combined presence of a sense of coherence, emotion regulation, and cognitive flexibility may buffer the key factors that drive SMA. In line with this view, salutogenic theory emphasizes that managing stressors, making them cognitively comprehensible, and regulating emotional responses serve as protective mechanisms against addiction (Antonovsky, 1987; Griffiths, 2009). Consequently, a sense of coherence, in conjunction with cognitive flexibility and emotion regulation, may serve to counteract SMA.

Sense of Coherence and Social Media Addiction

Sense of coherence (SoC) refers to the ability to manage stressors by making them comprehensible and finding meaning in them (Antonovsky, 1987). It encompasses three dimensions: understanding stressful situations (comprehensibility), addressing stressors (manageability), and being motivated to cope with stressors (meaningfulness) (Antonovsky, 1987). According to salutogenic theory, a high SoC strengthens adolescents' personal resources and coping mechanisms, which helps them manage stressors and protects against addiction (Antonovsky, 1987). Additionally, Griffiths (2009) reported that SoC-enhancing practices improved coping skills and reduced addiction. Previous research has demonstrated a negative correlation between SoC and internet addiction (Mortezaei & Rahiminezhad, 2017; Skonieczna et al., 2018). Furthermore, Mao and Zhao (2023) found that SoC mitigated SMA in college students. To date, only 1 study has examined the association between SoC and SMA, focusing on adolescents (Kaya & Cenkseven-Önder, 2024). However, it remains unclear how SoC operates in relation to SMA when considered alongside cognitive flexibility and emotion regulation. Thus, the present study aims to investigate the relationship between SoC and SMA in an adolescent population.

Cognitive Flexibility and Social Media Addiction

Cognitive flexibility is defined as the ability to recognize alternatives in any situation, respond flexibly, and adapt to varying conditions (Martin & Rubin, 1995). Individuals with high cognitive

flexibility seek alternative solutions when confronted with stressful situations (Jonassen & Grabowski, 1993). The cognitive flexibility model emphasizes that high cognitive flexibility enhances problem-solving skills and stress management, thereby serving as a protective factor against risky behaviors (Stevens, 2009). Moreover, Aydın et al. (2020) highlighted that cognitive flexibility, as an executive function, fosters behavioral regulation, the consideration of alternatives, and problem-solving, and acts as a buffer against SMA. Existing studies have reported a negative relationship between cognitive flexibility and SMA in university students (Tanhan et al., 2024; Wang et al., 2023). Additionally, Negahdari and Seyfe (2022) found that cognitive flexibility negatively predicted SMA in adolescents. While these studies have predominantly focused on university students, surprisingly, only 1 study has explored the relationship between cognitive flexibility and SMA in adolescents. More research is therefore needed to clarify the mechanisms underlying the association between adolescents' cognitive flexibility and SMA. Accordingly, this study aims to explore the relationship between cognitive flexibility and SMA in an adolescent sample.

Emotion Regulation and Social Media Addiction

Emotion regulation refers to the ability to employ strategies to manage one's emotional responses (Gross, 2015). Phillips and Power (2007) identified two types of emotion regulation: internal functional and external functional. Internal functional emotion regulation involves using internal processes to control emotions, while external functional emotion regulation involves seeking external support to manage emotions (Phillips & Power, 2007). Based on the process model of emotion regulation, the actions of observing, reinterpreting, modifying, and suppressing emotional responses serve as protective factors against addiction (Gross, 2015; Massah et al., 2016). In this context, Giordano et al. (2023) highlighted that high levels of emotion regulation improve emotional management and reduce SMA. Previous studies have identified a negative association between emotion regulation and SMA (Liu & Ma, 2022; Zsido et al., 2021). Additionally, emotion regulation has been shown to be a negative predictor of SMA in adolescents (Quagliari et al., 2021). Although these studies have uncovered the relationship between emotion regulation and SMA, further research is required to gain a deeper understanding of this association in adolescent populations. Therefore, the current study aims to investigate the relationship between emotion regulation and SMA in adolescents.

The Present Study

The I-PACE model highlights the potential of strategies targeting emotion, cognition, and execution functions, the internal processes that trigger SMA, to alleviate this addiction (Brand et al., 2019). Similarly, salutogenic theory suggests that making addiction cognitively comprehensible buffers its cognitive component, finding meaning and motivation in coping buffers its emotional component, and developing management skills buffers its executive component. Thus, this study sought to examine the connections among SoC, cognitive flexibility, and emotion regulation with SMA and to compare the profiles generated by these variables in relation to SMA (Antonovsky, 1987; Griffiths, 2009). Thus, this study sought to examine the connections among SoC, cognitive flexibility, and emotion regulation with SMA and to compare the profiles generated by these variables in relation

to SMA. Although grounded in salutogenic theory, the proposed hypotheses have not yet been fully explored. The study sought to bridge this knowledge gap, which may inform the design of prevention and intervention programs targeting SMA, using the salutogenic framework. Also, the findings will contribute to a clearer understanding of factors that buffer against SMA. Additionally, the results of this study will contribute to the formulation of psycho-educations, education plans, and policies that include a SoC, cognitive flexibility, and emotion regulation for the prevention and intervention of SMA. Based on these objectives, the following five hypotheses were proposed: (i) SoC is negatively associated with SMA; (ii) Cognitive flexibility is negatively associated with SMA; (iii) Internal functional emotion regulation is negatively associated with SMA; (iv) External functional emotion regulation is negatively associated with SMA; (v) SMA differs across latent profiles defined by SoC, emotion regulation, and cognitive flexibility; in other words, the mean levels of SMA vary according to these profiles.

Material and Methods

Participants and Procedure

In accordance with Tein et al. (2013) recommendation for latent profile analysis, which suggests a sample size between 250 and 500 participants, the current study included 415 participants recruited via convenience sampling. The sample included 230 females (55.4%) and 185 males (44.6%), with ages spanning from 13 to 18 years ($M_{age} = 16.36$, standard deviation = 1.31). The grade distribution was as follows: 97 students (23.4%) in 9th grade, 83 (20%) in 10th grade, 149 (35.9%) in 11th grade, and 86 (20.7%) in 12th grade. Participants reported an average daily social media usage time of 3.34 hours. Data were collected in high school classrooms, where participants completed the required scales. Participants and their parents signed informed consent forms and did not receive any incentives. The inclusion criteria were: (i) daily use of at least 1 social media platform, (ii) willingness to participate, (iii) parental consent, (iv) being a high school student, and (v) selecting the correct response to an attention-check item placed randomly within each scale (e.g., “If you are reading this question, tick three”). Participants who did not fulfill these criteria were omitted from the study. Ethical approval was obtained from the Çukurova University Scientific Research and Publication Ethics Committee in the Field of Social and Human Sciences (Approval No.: E-1097428 Date: 11/09/2024). The research followed the principles outlined in the Declaration of Helsinki during the entire study process.

Measures

Revised Sense of Coherence Scale

Developed by Bachem and Maercker (2018) and adapted into Turkish by Tekin and Kırloğlu (2019), this scale measures SoC across three dimensions: manageability, comprehensibility, and meaningfulness. The RSoC contains 13 items (e.g., “People can find a way to deal with the pain in life”) and is scored on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). A higher score indicates a stronger SoC. The Cronbach’s alpha for the original scale was 0.82, and for this study, it was 0.77. In the present study, model fit values were found to be within the acceptance range ($\chi^2/df = 2.43$, Adjusted Goodness of Fit Index (AGFI) = 0.92, Incremental Fit Index (IFI) = 0.92, Goodness of Fit Index

(GFI) = 0.95, Comparative Fit Index (CFI) = 0.92, Root Mean Square Error of Approximation (RMSEA) = 0.06, Standardized Root Mean Square Residual (SRMR) = 0.05).

Emotion Regulation Scale for Adolescents

The Emotion Regulation Scale for Adolescents, developed by Phillips and Power (2007) and adapted into Turkish by Duy and Yıldız (2014), consists of four dimensions and 18 items (e.g., “I try to think and understand the situation”). It is a 5-point Likert scale (1 = never, 5 = always). For the current study, only the internal functional and external functional emotion regulation dimensions were used, in line with the salutogenic framework. Higher scores on these dimensions indicate stronger emotion regulation. The original scale’s Cronbach’s alpha values for these dimensions were 0.86 and 0.65, respectively, while in this study, they were 0.79 for internal functional emotion regulation and 0.64 for external functional emotion regulation.

Cognitive Flexibility Scale

Originally developed by Martin and Rubin (1995) and adapted into Turkish by Çelikkaleli (2014), the Cognitive Flexibility Scale measures cognitive flexibility with 12 items (e.g., “I can express an idea in a different way”). It is a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree), with higher scores indicating greater cognitive flexibility. The Cronbach’s alpha for the scale was 0.74 in the original study, and 0.72 in the current study.

Social Media Addiction Scale for Adolescents

Developed by Özgenel et al. (2019), the Social Media Addiction Scale for Adolescents measures SMA with nine items (e.g., “When I don’t use social media, I get angry, anxious, or sad”). It is a 5-point Likert scale (1 = never, 5 = always), with higher scores indicating greater levels of SMA. The original scale’s Cronbach’s alpha was 0.90, and in this study, it was 0.87.

Statistical Analysis

In this study, Little’s Missing Completely at Random (MCAR) test was used to check for the randomness of missing data. A p -value greater than .05 indicates that the data are missing at random (Little, 1988). The missing data rate was below the 5% threshold recommended by Little (1988). Skewness and kurtosis values were used to assess normality, with acceptable values between ± 2 indicating normal distribution (George & Mallery, 2010). To assess for common method bias, Herman’s single-factor test was performed, with a score under 50% suggesting that common method bias was not an issue (Podsakoff et al., 2003). Following these preliminary checks, the Pearson correlation coefficient was used to evaluate the relationships between the variables.

Latent profile analysis was performed using the Jamovi 2.5.6 package based on R software. Models ranging from two to six profiles were evaluated to determine the most suitable number of profiles. Selection criteria included the smallest Bayesian Information Criterion (BIC), Akaike Information Criterion (AIC), and Sample-size-adjusted BIC (SABIC) values (Spurk et al., 2020), as well as entropy goodness-of-fit values greater than 0.80 (Muthén, 2004). Additionally, the sample size for the smallest profile had to be above 5% (Marsh et al., 2009). The bootstrapped likelihood ratio test (BLRT) was employed to compare sequential models (k-class model compared to k-1 class model) with a non-significant BLRT p -value indicating that the prior model was the

best fit (Tein et al., 2013). After identifying the profiles, they were compared in terms of SMA using one-way ANOVA. Analyses were performed using both Jamovi 2.5.6 and SPSS 25 (IBM SPSS Corp.; Armonk, NY, USA).

Results

Preliminary Assumptions

The MCAR test resulted in a *p*-value of .39, indicating that the missing data were randomly distributed. Missing data from 18 participants (less than 5%) were imputed using series averages. Skewness values ranged from -0.90 to 0.28, and kurtosis values ranged from -0.59 to 0.97, satisfying the normal distribution criteria. Herman’s single-factor test resulted in a score of 19.24%, which ruled out common method bias. With these preliminary assumptions met, the correlation analysis was conducted.

Correlation Statistics

The Pearson correlation analysis revealed that SoC was negatively related to SMA ($r = -0.19, p < .05$), cognitive flexibility was negatively related to SMA ($r = -0.26, p < .05$), internal functional emotion regulation was negatively related to SMA ($r = -0.18, p < .05$), external functional emotion regulation was negatively related to SMA ($r = -0.14, p < .05$) (see Table 1).

Best Number of Profiles with Latent Profile Analysis

Five models were tested, ranging from two to six profiles. The two-profile and four-profile models were rejected due to entropy goodness-of-fit values below 0.80. The five-profile and six-profile models were excluded because the sample size of the smallest profile was below 5%. The three-profile model was accepted as

the best model, having the smallest AIC, BIC, and SABIC values, entropy values above 0.80, and a sample size for the smallest profile exceeding 5%. Additionally, the BLRT *p*-value for the four-profile model was non-significant, confirming that the three-profile model was optimal (Table 2).

In this three-profile model, Profile 1 was labeled the “low profile,” Profile 2 the “high profile,” and Profile 3 the “medium profile.” SoC, cognitive flexibility, internal functional emotion regulation, and external functional emotion regulation mean scores were below the overall mean for the low profile, near the overall mean for the medium profile, and above the overall mean for the high profile (see Table 3). Figure 1 shows a comparison of the three profiles based on SoC, cognitive flexibility, internal functional emotion regulation, and external functional emotion regulation.

Comparison of Profiles

A one-way ANOVA was conducted to compare SMA across the three profiles. As shown in Table 4, SMA significantly differed across profiles ($F = 14.51, p < .05$). Post hoc comparisons indicated that the high profile exhibited significantly less SMA than the medium and low profiles, while the medium profile displayed less SMA than the low profile.

Discussion

The current study examined the relationships between SoC, cognitive flexibility, emotion regulation, and SMA and found significant differences in SMA across different profiles. The first hypothesis, which posited a negative association between SoC and SMA, was confirmed. This is consistent with findings by

Table 1.
Descriptive Statistics and Correlation Values

Variable	Mean	SD	Skewness	Kurtosis	1	2	3	4	5
1. SoC	45.80	8.39	-0.75	0.97	-				
2. CF	49.53	9.21	-0.19	-0.52	0.51**	-			
3. IFER	15.25	3.65	-0.90	0.78	0.67**	0.50**	-		
4. EFER	12.85	3.74	-0.22	-0.51	0.23**	0.21**	0.29**	-	
5. SMA	23.26	8.79	0.28	-0.59	-0.19**	-0.26**	-0.18**	-0.14**	-

Note: CF = Cognitive flexibility; EFER = External functional emotion regulation; IFER = Internal functional emotion regulation; SMA = Social media addiction; SoC = Sense of coherence.

**p* < .05.

***p* < .01.

Table 2.
Fit Indices for Different Profile Models

Models	AIC	BIC	SABIC	Entropy	BLRT	Smallest Profile Ratio (%)
Two profiles model	10189.264	10241.631	10200.379	0.767	325.208**	30
Three profiles model	10032.051	10104.561	10047.442	0.835	167.212**	6
Four profiles model	10033.408	10126.059	10053.074	0.756	8.643	6
Five profiles model	10037.922	10150.714	10061.863	0.771	5.486	2
Six profiles model	10026.588	10159.521	10054.804	0.678	21334*	4

Note: AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; BLRT = Bootstrapped likelihood ratio test; SABIC = Sample-size-adjusted Bayesian Information Criterion.

**p* < .05.

***p* < .01.

Table 3.
Descriptive of Three Profiles Model

Profiles	Profile 1: Low Profile (6%)			Profile 2: High Profile (56%)			Profile 3: Medium Profile (38%)		
Variable	N	Mean	SE	N	Mean	SE	N	Mean	SE
CF	24	37.72	2.47	232	54.21	0.59	159	44.65	0.67
SoC	24	26.76	2.09	232	50.66	0.42	159	41.70	0.60
IFER	24	6.33	0.70	232	17.60	0.19	159	13.23	0.22
EFER	24	9.48	1.02	232	13.86	0.25	159	11.92	0.38

Note: CF = Cognitive flexibility; EFER = External functional emotion regulation; IFER = Internal functional emotion regulation; SMA = Social media addiction; SoC = Sense of coherence.

* $p < .05$.
** $p < .01$.

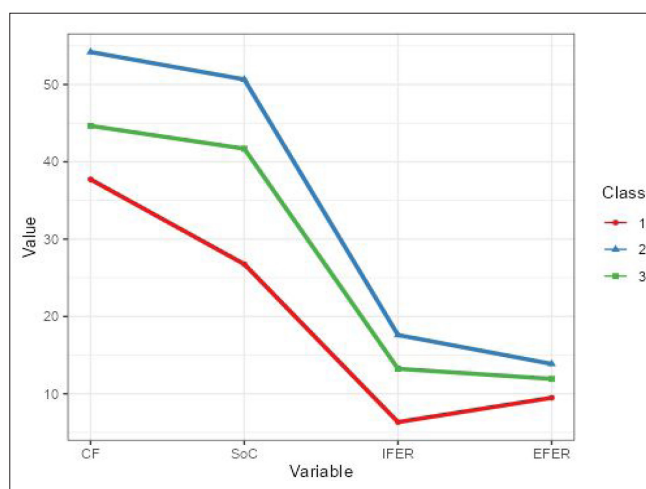


Figure 1 Comparison of Profiles. CF = Cognitive flexibility; EFER = External functional emotion regulation; IFER = Internal functional emotion regulation; SoC = Sense of coherence.

Mao and Zhao (2023), who highlighted that a high SoC enables adolescents to manage stress and cope effectively with problems, thereby reducing SMA. Similarly, Kaya and Cenkseven-Önder (2024) found a positive association between SoC and SMA among adolescents. Salutogenic theory offers a potential explanation for this relationship. According to this theory, SoC fosters personal resources and coping mechanisms, protecting adolescents from addiction by promoting resilience to stress (Antonovsky, 1987). A high SoC enables adolescents to manage negative emotions and withstand stress, ultimately lowering their susceptibility to SMA.

The second hypothesis, which suggested a negative association between cognitive flexibility and SMA, was also supported. This aligns with previous studies, such as those by Tanhan et al. (2024)

and Wang et al. (2023), which found similar results. Aydın et al. (2020) argued that cognitive flexibility mitigates SMA by enhancing problem-solving skills and the ability to consider alternative solutions. The cognitive flexibility model posits that cognitive flexibility equips individuals with better coping mechanisms and protective factors (Stevens, 2009), allowing them to adapt to stressors, think flexibly, and thus disrupt SMA.

The third hypothesis, regarding the negative association between emotion regulation and SMA, was confirmed as well. The study by Quaglieri et al. (2021) reported similar findings. According to Liu and Ma (2022), high emotion regulation improves the ability to manage negative emotions, thereby acting as a buffer against SMA. The process model of emotion regulation offers insight into this relationship. This model suggests that emotion regulation enhances the ability to monitor, manage, and suppress emotions, reducing the likelihood of SMA (Gross, 2015; Massah et al., 2016).

Lastly, the study found that the profiles differ in terms of SMA. The high-profile group exhibited lower SMA levels than both the medium- and low-profile groups, while the medium profile showed less SMA than the low profile. Salutogenic theory posits that making stressors cognitively comprehensible, regulating them emotionally, and developing management resources protects against addiction (Antonovsky, 1987; Griffiths, 2009). Consistent with this assumption, the present study found that the profile characterized by a high SoC, cognitive flexibility, and emotion regulation reported lower levels of SMA compared to profiles with lower levels of these attributes. Moreover, this finding aligns with the I-PACE model (Brand et al., 2019). Emotion regulation, through its role in managing emotional fluctuations, addresses the affective factors that trigger SMA. Cognitive flexibility, by disrupting rigid and maladaptive cognitions, mitigates the cognitive factors that contribute to SMA. SoC, by strengthening the ability to manage stressors, acts as a buffer against the

Table 4.
ANOVA Results of Profiles

Variable	Profiles	N	Mean	SD	F	P	Post Hoc (Tukey)
SMA	Low profile	24	29.50	10.38	14.51	.00	Low profile-High profile
	High profile	232	21.48	8.98			Low profile-Medium profile
	Medium profile	159	24.92	7.46			Medium profile-High profile

Note: SD = Standard deviation; SMA = Social media addiction.

executive factors linked to SMA. Taken together, the integration of SoC, cognitive flexibility, and emotion regulation may serve a protective function against SMA.

Limitations and Directions/Suggestions for Future Research

This study had several limitations. It employed a cross-sectional design, preventing the examination of changes in profiles over time. Future longitudinal studies could explore the evolution of these profiles and their relationship with SMA. Another limitation was the use of self-report scales, which may introduce biases. Future research could adopt a mixed-methods approach to enhance validity. Additionally, the convenience sampling method may not have captured a fully representative sample of adolescents, suggesting that future studies could use more robust sampling techniques. This study has practical implications. SMA prevention and intervention programs based on salutogenic theory can be developed, focusing on enhancing adolescents' SoC, cognitive flexibility, and emotion regulation. Educators and practitioners could organize group activities or psycho-education sessions aimed at strengthening these attributes, helping to buffer adolescents against SMA. Developing psycho-education programs targeting adolescents with low scores on SoC, cognitive flexibility, and emotion regulation could be a vital step in reducing SMA.

This study addresses a significant gap in the literature by demonstrating the negative association of SoC, cognitive flexibility, and emotion regulation with SMA. It also found that profiles characterized by high levels of these attributes had lower SMA scores compared to medium- and low-profile groups. These findings suggest that SoC, cognitive flexibility, and emotion regulation play a protective role against SMA.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

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ORIGINAL ARTICLE

Executive Dysfunction and Psychological Symptoms in Problematic Social Media Use

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Main Points

- Problematic social media use was correlated with impairments in executive functions, particularly in organizational abilities, underscoring the cognitive control deficits commonly observed in behavioral addictions.
- Higher levels of depression, anxiety, and stress were observed among individuals with greater PSMU, supporting the link between emotional distress and maladaptive technology engagement.
- Psychological variables—particularly stress levels and sleep quality—were found to be closely associated with executive functions. Individuals with higher levels of empathy exhibited greater stress and poorer sleep quality, while those experiencing more pronounced psychological distress also showed difficulties in organization and impulse control.

Abstract

This study aimed to investigate the relationship between problematic social media use (PSMU), executive functions, depression, anxiety, stress, and sleep quality in a healthy adult population. A total of 174 adults (62.6% female, mean age = 37.19 ± 9.17 years) were recruited online. Participants completed a sociodemographic data form, the Bergen Social Media Addiction Scale (BSMAS), the Executive Function Index (EFI), the Depression Anxiety Stress Scale-21 (DASS-21), and the subjective sleep quality subscale of the Pittsburgh Sleep Quality Index (PSQI). Pearson correlations were conducted. Problematic social media use showed negative associations with executive functioning, particularly with organization ($r = -.423, p < .001$). In addition, BSMAS scores were positively correlated with depression ($r = .354, p < .001$), anxiety ($r = .217, p < .001$), and stress ($r = .233, p < .001$). The findings indicate that PSMU is strongly linked to executive function and psychological distress. These results highlight the need for interventions targeting cognitive regulation, emotional well-being, and healthy technology use.

Keywords: Executive functions, mental health, problematic social media use

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Introduction

Problematic social media use (PSMU) is a public health concern characterized by excessive social media engagement, preoccupation, and loss of control despite its negative consequences (Andreassen et al., 2017). Excessive interactions on social media platforms are associated with emotional dysregulation, poorer academic and occupational performance, and reduced well-being (Marino et al., 2018; Sha et al., 2019).

An increasing body of evidence has emphasized the relationship between PSMU and mental health concerns. Meta-analyses have demonstrated that problematic use of Facebook is associated with depressive symptoms (Yoon et al., 2019). With the increasing use of social media, psychiatric symptoms, such as anxiety and stress, are also frequently observed (Dhir et al., 2018; Huang, 2017). Such findings indicate a bidirectional process: emotional distress can increase social media use, while excessive use further exacerbates distress (Brand et al., 2019).



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Mediated by the prefrontal cortex, executive functions include planning, time management, impulse control, working memory, and cognitive flexibility (Spinella, 2005). Impaired planning and impulse control have been reported in individuals with problematic internet use (Ioannidis et al., 2019; Wegmann & Brand, 2020). Such impairments may weaken one's ability to evaluate the consequences of behaviors, thus fostering compulsive online behaviors.

Another important research domain in the area of social media use is sleep and sleep quality. Problematic social media use is associated with shorter sleep duration, delayed bedtimes, and poorer sleep quality (Xanidis & Brignell, 2016; Wolniczak et al., 2013). Late-night interactions with devices disrupt circadian rhythms, contributing to cognitive fatigue and emotional problems (Sha et al., 2019). In turn, sleep disturbances can exacerbate executive dysfunction and psychological distress, creating a negative cycle.

Despite the growing body of evidence, relatively few studies have simultaneously explored the interactions among social media use, executive functions, psychological distress, and sleep quality. This study addresses this gap by investigating such domains within a community-based adult sample. The authors hypothesize that greater PSMU would be associated with executive functions, increased depression, anxiety, and stress, and reduced subjective sleep quality.

Material and Methods

Participants and Procedure

This cross-sectional study was carried out between March and May 2025, involving individuals aged 18 and above who were reached through targeted recruitment on Instagram. Inclusion criteria comprised individuals aged between 18 and 65 years who voluntarily agreed to participate by providing informed consent. Exclusion criteria included the presence of any psychiatric or neurological disorders that could affect executive functioning, current use of psychotropic medications, illicit substance use, or alcohol dependence.

Ethical approval for this study was obtained from the Scientific Research and Publication Ethics Committee of Memorial Antalya Hospital on March 10, 2025, under approval number 2, and Helsinki Declaration rules were followed to conduct this study. All participants provided informed consent. This research adhered to institutional and/or national research committee ethical standards, as well as the 1964 Helsinki Declaration and its subsequent amendments or comparable ethical standards.

Prior to data collection, electronic informed consent was obtained from all participants; clicking the "I agree to participate in the study" button on the online form was deemed equivalent to signing the informed consent form. Following this, participants completed a sociodemographic questionnaire collecting information on age, gender, education level, marital status, occupational status, physical health conditions, harmful habits, and psychiatric history. Subsequently, the following standardized instruments were administered: the Bergen Social Media Addiction Scale (BSMAS), the Executive Function Index (EFI), the Depression Anxiety Stress Scale-21 (DASS-21), and the Pittsburgh Sleep Quality Index (PSQI)—subjective sleep quality subscale. To

prevent duplication, each participant was allowed to complete the survey only once using the same email address.

Initially, 236 participants were enrolled in the study; however, 14 were excluded for not completing the study, and 48 were excluded due to a history of psychiatric disorder or current use of psychotropic medications. Among the participants included in this study, 62.6% were female and 37.4% were male, with a mean age of 37.19 ± 9.17 years. Regarding marital status, 21.3% were single, 65.5% were married, 6.9% were in a relationship, and 6.3% were divorced.

Measures

Sociodemographic Data Form gathered comprehensive demographic and personal information, including participants' age, gender, marital status, educational attainment, employment status, physical and psychiatric history, and current smoking, alcohol, and illicit substance use.

Bergen Social Media Addiction Scale, developed by Andreassen et al. (2016), is a six-item self-report instrument designed to assess PSMU over the past 12 months. Each item corresponds to one of the six core addiction components: salience, mood modification, tolerance, withdrawal, conflict, and relapse. Items are rated on a 5-point Likert scale ranging from 1 (very rarely) to 5 (very often), with total scores ranging from 6 to 30; higher scores reflect greater levels of PSMU. An example item is, "How often during the last year have you used social media to forget about personal problems?" The original scale demonstrated high internal consistency (Cronbach's $\alpha = .88$). The Turkish adaptation of the scale was validated by Demirci (2019), who reported a test-retest reliability coefficient of 0.83 based on a 3-week interval with 51 participants. **In the present study, the Cronbach's alpha coefficient for the BSMAS was 0.86, indicating good internal consistency.**

Executive Function Index is a 27-item self-report instrument developed by Spinella (2005) to assess executive functioning in non-clinical populations. It comprises five subscales: motivational drive (4 items), organization (5 items), impulse control (5 items), empathy (6 items), and strategic planning (7 items). Items are rated on a 5-point Likert scale ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"), with higher scores indicating more effective executive functioning. The subscales reflect distinct domains of executive function associated with prefrontal-subcortical activity. The original scale demonstrated acceptable internal consistency, with Cronbach's alpha values ranging from 0.69 to 0.76, and 0.82 for the total score. The Turkish adaptation of the EFI was conducted by Kafadar and Arıcan (2022), who reported Cronbach's alpha coefficients ranging from .54 to .76, indicating an acceptable level of reliability for the Turkish version. **In the present study, the Cronbach's alpha coefficient for the EFI was 0.77, indicating acceptable internal consistency.**

Depression Anxiety Stress Scale-21 is a short-form self-report instrument developed by Lovibond and Lovibond (1995) to assess symptoms of depression, anxiety, and stress over the past week. The scale consists of 21 items, with seven items allocated to each subscale. Respondents rate each item on a 4-point Likert scale ranging from 0 ("Never") to 3 ("Always"), with higher scores indicating greater symptom severity. The Turkish adaptation of the scale was carried out by Sarıçam (2018), who examined both

construct and criterion validity. Exploratory and confirmatory factor analyses supported the three-factor structure, with item loadings ranging from 0.42 to 0.72 and good model fit indices. Internal consistency coefficients for the Turkish clinical sample were 0.87 for the depression subscale, 0.85 for the anxiety subscale, and 0.81 for the stress subscale, indicating satisfactory reliability. In the present study, the Cronbach's alpha coefficients for the DASS-21 subscales were 0.87, 0.86, and 0.83 for depression, anxiety, and stress, respectively, with the total scale demonstrating excellent internal consistency at 0.93.

Pittsburgh Sleep Quality Index assesses sleep quality and disturbances over the past month and is widely used. Developed by Buysse et al. (1989), it has demonstrated good reliability (Cronbach's alpha = 0.80). The Turkish version, validated by Ağargün et al. (1996), showed similar reliability. The scale contains 24 items, 19 self-reported and 5 answered by a roommate or spouse (not scored). Eighteen items are grouped into seven components scored 0–3, with a total score ranging from 0 to 21; higher scores indicate poorer sleep quality. The seven components include subjective sleep quality, sleep latency, duration, efficiency, disturbances, medication use, and daytime dysfunction. This study included only the subjective sleep quality subscale.

Statistical Analysis

Statistical analyses were conducted using the Jamovi v2.5 software package (The Jamovi Project 2024). Continuous variables were reported as means and standard deviations, while categorical variables were summarized with counts and percentages. Normality was assessed using skewness and kurtosis values, and visual inspection of histogram plots. According to the literature, a skewness value between –2 and +2 and kurtosis values between –7 and +7 are interpreted as indicative of normal distribution (Hair et al., 2010). The correlations of the total and subscale scores of the participants group's BSMAS, EFI, DASS-21, and Pittsburgh Sleep Quality Index—subjective sleep quality subscale were assessed using Pearson correlation analysis. The results of the analyses are presented in tabular form. The significance level for all tests was set at $p < .05$.

Table 1.
Sociodemographic Characteristics of the Participants

Variables	Patients (n = 174)
Age (mean ± SD)	37.19 ± 9.17
Gender (n(%))	
Female	109 (62.6)
Male	65 (37.4)
Marital status (n(%))	
Single	37 (21.3)
Married	114 (65.5)
In a relationship	12 (6.9)
Divorced	11 (6.3)
Education duration (mean ± SD)	14.4 ± 3.0
High school or below (n(%))	16 (9.2)
University degree or above (n(%))	158 (90.8)
Number of employees (n(%))	158 (90.8)
Presence of physical disease (n(%))	27 (15.5)
Cigarette use (n(%))	
Yes	38 (21.8)

n = number, SD = standard deviation, % = frequency.

Results

The sociodemographic characteristics of the participants are presented in Table 1.

The mean score for PSMU, as measured by the BSMAS, was 15.38 (SD = 5.57). The total Executive Function Index score had a mean of 99.88 (SD = 11.31), with subscale means of 14.66 (SD = 2.92) for Motivational Drive, 17.71 (SD = 4.16) for Organization, 18.37 (SD = 3.25) for Impulse Control, 24.23 (SD = 4.53) for Empathy, and 24.88 (SD = 4.39) for Strategic Planning. For psychological symptoms, the DASS-21 total score had a mean of 15.56 (SD =

Table 2.
Descriptive Statistics for Study Measures

Variables	Mean	SD	Skewness	Kurtosis	Minimum	Maximum
Bergen Social Media Addiction Scale	15.38	5.57	0.395	–0.391	6	30
Executive Function Index						
Motivational Drive	14.66	2.92	–0.135	–0.257	6	20
Organization	17.71	4.16	–0.357	–0.166	6	25
Impulse Control	18.37	3.25	–0.549	1.038	5	25
Empathy	24.23	4.53	–0.955	0.686	9	30
Strategic Planning	24.88	4.39	–0.630	1.062	11	35
DASS-21						
Depression	5.31	4.29	1.099	1.465	0	21
Anxiety	4.02	3.91	1.203	1.688	0	20
Stress	6.22	4.11	0.635	0.046	0	21
Sleep quality	1.32	0.57	0.188	–0.170	0	3

DASS-21 = Depression Anxiety Stress Scale-21, SD = standard deviation.

Table 3.
Correlation between Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1	-											
2	-0.043	-										
3	-0.423***	0.081	-									
4	-0.095	-0.181*	0.281***	-								
5	0.102	0.377***	-0.135	0.022	-							
6	-0.040	0.494**	0.034	-0.008	0.662**	-						
7	-0.168*	0.579***	0.428***	0.350***	0.712***	0.791***	-					
8	0.354**	-0.187*	-0.275***	-0.064	0.026	-0.078	-0.188*	-				
9	0.217***	-0.112	-0.254**	-0.059	0.048	-0.019	-0.128	0.674***	-			
10	0.233**	-0.001	-0.270***	-0.168*	0.155*	0.080	-0.055	0.741***	0.702***	-		
11	0.301**	-0.113	-0.298**	-0.108	0.085	-0.007	-0.139	0.903***	0.878***	0.909***	-	
12	0.087	-0.097	-0.236*	-0.111	0.216**	0.060	-0.034	0.285***	0.241**	0.276**	0.298***	-

1: Bergen Social Media Addiction Scale, 2: Motivational drive, 3: Organization, 4: Impulse control, 5: Empathy, 6: Strategic planning, 7: Total score of Executive Function Index, 8: Depression, 9: Anxiety, 10: Stress, 11: Total score of Depression Anxiety Stress Scale - 21, 12: Sleep quality. * $p < .05$, ** $p < .01$, *** $p < .001$.

11.04), with subscale means of 5.31 (SD = 4.29) for Depression, 4.02 (SD = 3.91) for Anxiety, and 6.22 (SD = 4.11) for Stress. Finally, participants' subjective sleep quality scores on the PSQI had a mean of 1.32 (SD = 0.57). These descriptive statistics are summarized in Table 2.

The BSMAS showed significant positive correlations with depression ($r = 0.35, p < .001$), anxiety ($r = 0.21, p < .001$), and stress ($r = 0.23, p < .001$). Conversely, it was negatively associated with organization ($r = -0.42, p < .001$), indicating that higher levels of PSMU were related to lower organizational abilities. Sleep quality showed negative associations with organization ($r = -0.23, p < .01$) and positive correlations with empathy ($r = 0.21, p < .01$), depression ($r = 0.28, p < .001$), anxiety ($r = 0.24, p < .01$), and stress ($r = 0.27, p < .001$). Overall, the pattern suggests that greater social media addiction and higher levels of psychological distress are associated with lower executive functioning capacities, particularly in organization and impulse control. A comprehensive overview of the remaining associations among study variables is provided in Table 3.

Discussion

The present study demonstrated that PSMU was correlated with deficits in executive functioning, particularly in organizational abilities, and higher levels of depression, anxiety, and stress. Although the association with sleep quality did not reach statistical significance, the direction of the relationship was consistent with theoretical expectations, suggesting that sleep may still play a relevant role in cognitive-emotional regulation among social media users. These findings extend prior research by providing additional evidence that complements earlier studies linking addictive social media behaviors to deficits in impulse control and planning, thereby contributing novel insights to the existing literature (Wegmann & Brand, 2020; Ioannidis et al., 2019). The particularly strong correlation between PSMU and organization underscores the involvement of neurocognitive processes in behavioral addictions.

The authors' findings highlight strong associations between PSMU and psychiatric symptoms. Greater levels of depression, anxiety, and stress among individuals with high levels of social media engagement align with previous meta-analyses identifying social media use as a risk factor for psychological distress (Marino et al., 2018; Yoon et al., 2019). Potential mediators include social comparison, cyberbullying, and a fear of missing out (FOMO) (Dhir et al., 2018; Huang, 2017). This supports a reciprocal reinforcement model, wherein individuals who are experiencing distress may turn to social media as a maladaptive coping mechanism, while, in turn, excessive use may aggravate distress (Brand et al., 2019).

Consistent with recent evidence, higher stress levels have been associated with poorer impulse control, as stress can impair prefrontal regulatory processes involved in executive functioning (Zhou et al., 2024). This finding suggests that individuals experiencing elevated psychological distress may be more vulnerable to impulsive behaviors, potentially contributing to PSMU.

By addressing executive functions, emotional symptoms, and sleep in combination, the findings of the present study contribute

to a more integrated understanding of PSMU. While many prior studies have examined these domains in isolation, the authors' findings demonstrate that they intersect to form a multidimensional risk profile. Cognitive dysfunction, emotional distress, and maladaptive behaviors likely interact to maintain problematic usage patterns (Brand et al., 2019). These findings underscore the importance of interventions to strengthen executive control, support emotional regulation, and promote healthier use of technology. Clinicians should be attentive to comorbid symptoms, such as depression, anxiety, and poor sleep, among individuals displaying problematic social media behaviors. At-risk populations may benefit from programs fostering digital literacy and self-regulation.

This study demonstrates that PSMU is related to impaired executive functions—particularly organization—and elevated levels of depression, anxiety, and stress. Overall, the authors' findings underscore the importance of clinical assessments and preventive interventions targeting cognitive regulation, emotional well-being, and healthy technology use. Longitudinal research is necessary to clarify causal mechanisms and guide evidence-based interventions.

Limitations and Suggestions for Future Research

Several limitations of the present study should be acknowledged. First, the cross-sectional design precludes any definitive conclusions regarding causal relationships among the variables. Additionally, the recruitment of participants through voluntary responses on social media platforms, particularly via Instagram, may limit the generalizability of the findings to the broader population and introduce self-selection bias due to the potential overrepresentation of highly active social media users. Because all data were collected through self-report instruments, potential biases—such as social desirability and response bias—cannot be ruled out. The exclusive reliance on self-report measures introduces potential biases, including social desirability and response bias. Furthermore, the assessment of sleep was restricted to the subjective sleep quality subscale of the PSQI, which may not comprehensively capture all dimensions of sleep. Finally, the exclusion of individuals reporting psychiatric or neurological conditions that could potentially affect cognitive functioning represents a limitation, as it restricts the generalizability of the findings to clinical populations.

Future research should consider employing longitudinal or experimental designs to elucidate the causal relationships between social media use, executive functions, psychological symptoms, and sleep quality. Investigations involving more diverse samples in terms of age, socioeconomic status, and clinical characteristics would enhance the generalizability of findings. The integration of objective measures, such as neuropsychological tests, neuroimaging techniques, or biological markers, could provide a more comprehensive evaluation of executive functioning and sleep. Cross-cultural comparative studies would further clarify how psychosocial effects of social media use vary across different cultural contexts. Finally, **intervention-based studies aimed at regulating social media use, enhancing executive functioning, and improving sleep quality, as well as providing appropriate psychosocial support mechanisms for individuals experiencing psychological distress, could offer significant and multifaceted contributions to clinical and preventive mental health practices.**

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical approval for this study was obtained from the Scientific Research and Publication Ethics Committee of Memorial Antalya Hospital (Approval no: 2, Date: March 10, 2025)

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ORIGINAL ARTICLE

Intolerance of Uncertainty in the Relationship between Self-regulation and Social Media Addiction

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Main Points

- Overuse of social media among young adults exacerbates addiction issues and is associated with mental health concerns.
- Individuals with high self-regulation skills have a lower risk of social media addiction because they are better able to cope with intolerance of uncertainty.
- Intolerance of uncertainty serves as a partial mediator of the association between self-regulation skills and social media addiction.
- Developing strategies to enhance resilience in the face of uncertainty is important for strengthening resistance to social media addiction.

Abstract

Excessive use of social media can result in anxiety, communication problems, and depression. Identifying the factors that contribute to these negative outcomes is essential for mitigating the detrimental effects of social media usage. This study aims to explore the mediating effect of intolerance of uncertainty on the relationship between self-regulation skills and social media addiction. The sample comprised 365 university students, with 224 females (61.4%) and 141 males (38.6%), aged 18 to 28, with a mean age of 20.79. The measurement tools utilized included the Social Media Addiction Scale, the Intolerance of Uncertainty Scale, and the Self-Regulation Scale. Data analysis was conducted through structural equation modeling, incorporating bootstrapping techniques as well. Results demonstrated significant negative correlations between self-regulation and intolerance of uncertainty, as well as a notable positive correlation between intolerance of uncertainty and social media addiction. The structural equation modeling indicated that intolerance of uncertainty serves as a partial mediator in the relationship between self-regulation skills and social media addiction. Ultimately, the findings suggest that diminished self-regulation skills among young adult university students may reduce their tolerance for uncertainty, thereby increasing their propensity for social media addiction.

Keywords: Intolerance of uncertainty, self-regulation, social media addiction, structural equation modeling

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Introduction

The rise in social media platforms and their easy accessibility has significantly increased their usage among young adults (Primack et al., 2017). While this widespread engagement can yield both positive and negative outcomes, it also raises concerns about addictive behaviors that may contribute to various physical and psychological problems (Verduyn et al., 2017). Research indicates that problematic use of social media can lead to anxiety, communication issues, and depression. Consequently, it is crucial to

explore the factors influencing social media addiction (SMA), as understanding these variables is essential for addressing potential addiction outcomes.

Self-regulation, which enables individuals to control their behaviors through observation, evaluation, and inference, is becoming increasingly significant in this context. Its importance in identifying and addressing behavioral excesses or deficiencies has been well documented (Bandura et al., 2003). Thus, delving into how self-regulation affects SMA may provide valuable insights into mitigating this issue.

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Self-regulation is the capacity to manage thoughts, emotions, and actions toward achieving personal objectives, employing a cyclical approach of self-monitoring, self-evaluation, and self-reinforcement (Zimmerman, 2000). Self-monitoring enables the individual to notice his or her own behaviors, while self-evaluation involves comparing these behaviors with internal criteria. Self-reinforcement refers to the individual's use of intrinsic or extrinsic rewarding strategies to motivate himself or herself (Brown, 1999). Effective self-regulation is critical for coping with stress and challenges, underscoring the need for strategies to enhance these skills (Swanson et al., 2011).

This study posits that self-regulation might act as a buffering mechanism to mitigate the risk of SMA, potentially weakening the link between addiction and its negative effects. Individuals with high self-regulation abilities are likely to better manage their social media usage and mitigate addiction-related consequences (Zhang et al., 2024). Conversely, insufficient self-regulation can lead to SMA, goal conflicts, and detrimental impacts on subjective well-being (Reinecke et al., 2022). For example, low self-control among adolescents has been linked to increased susceptibility to internet addiction, including social media (Zhu, 2025), while higher self-regulatory self-efficacy has shown a negative association with addiction to social networking platforms (Favini et al., 2024).

Studies have shown that those at risk for internet addiction exhibit lower self-regulation levels, marking this as a crucial variable in SMA. Accordingly, this study proposes the hypothesis:

H1: Self-regulation negatively predicts SMA.

Intolerance of Uncertainty, Social Media Addiction, and Self-Regulation Skills

Intolerance of uncertainty (IU) refers to cognitive challenges in tolerating negative situations stemming from perceived ambiguity (Carleton, 2016). Studies indicate that individuals with heightened levels of IU tend to view ambiguous situations more negatively. This interpretation style may lead to increased anxiety levels and exacerbate addictive behaviors by turning to maladaptive coping strategies (Qiu et al., 2024). Sadeh and Bredemeier (2021) highlighted a correlation between high IU and impulsive behaviors, including aggression and substance use. Individuals experiencing high IU typically exhibit lower emotional resilience and often engage in short-term relief strategies that have negative long-term effects. Additionally, elevated levels of IU have been linked to maladaptive coping strategies, including the use of substances as a means to alleviate negative feelings (Rozgonjuk et al., 2019).

Carleton et al. (2016) established a connection suggesting that greater IU is linked to heightened mobile phone usage and internet usage, suggesting that digital tools serve as coping mechanisms for uncertainty, albeit at the cost of increased anxiety. Intolerance of uncertainty's multidimensional nature not only influences emotional processes but also behavioral patterns linked to technology use. Recent studies emphasize that IU is associated with both externalizing behaviors and internalizing avoidance strategies like digital addiction (Qiu et al., 2024). Especially, high IU individuals demonstrate heightened anxiety

in uncertain situations, often resorting to excessive smartphone use for relief, which can evolve into maladaptive coping in the long term (Liu et al., 2022).

Recent research during uncertain conditions, such as the COVID-19 pandemic, indicates that IU reinforces connections to digital addiction through perceived stress and rumination, leading users to seek approval in social media environments (Sang et al., 2024). These findings suggest that IU significantly impacts the propensity for SMA (Henzel & Håkansson, 2021), particularly as individuals with high IU may gravitate to social media for comfort, increasing addiction risk (Morris et al., 2023). Therefore, this study proposes a second hypothesis:

H2: Intolerance of uncertainty positively predicts SMA.

The level of an individual's tolerance for uncertainty shapes their reactions to unpredictable environments. In this context, an individual's growth need strength can affect both the capacity to tolerate emotional distress and the motivation triggered by this situation (van Hooff & van Hooff, 2017). According to the self-regulation theory, self-regulation enables an individual to control his/her thoughts and emotions in the face of a certain situation, to make evaluations and to exhibit goal-oriented behaviors in line with this evaluation. Research indicates that a person's experiences of boredom may be associated with their self-regulation abilities (Brown et al., 1999; Zimmerman, 2000).

The correlation between IU and self-regulation significantly influences emotional well-being and the presence of anxiety disorders. Research shows that individuals with high IU tend to exhibit lower self-regulation, which can intensify emotional challenges. When confronted with uncertain circumstances, those with high IU often experience increased stress and unease, negatively impacting their emotional health and psychological well-being (Morris et al., 2023). Thus, this study proposes a third hypothesis:

H3: Self-regulation negatively predicts IU.

Therefore, the fourth hypothesis is:

H4: Intolerance of uncertainty has a mediating role between self-regulation and SMA.

The Present Study

The interplay between SMA, IU, and self-regulation skills is intricate and nuanced. High levels of SMA are believed to correlate with greater IU and diminished self-regulation, potentially impacting mental health negatively. To mitigate adverse effects of social media use among young adults, it is crucial to explore the factors. This study aims to investigate how IU may mediate the relationship between self-regulation and SMA, shedding light on these interconnected variables.

Material and Methods

Informed Consent

For this research, informed consent was secured from every participant involved in the study.

Ethical Approval

The study adhered to the ethical standards outlined in the 1964 Declaration of Helsinki and its later revisions, receiving approval from the Scientific Research and Ethics Review Board of Tekirdağ Namık Kemal University (Approval No.: T2024-2260; Date: 02.12.24).

Participants

The study comprised 365 young adult volunteers from a university, with 224 participants (61.4%) identifying as female and 141 (38.6%) as male. The participants' ages ranged between 18 and 28 years, yielding a mean age of 20.79 years and a standard deviation of 2.63. In terms of academic levels, 208 participants (57%) were first-year students, 68 (18.6%) were in their second year, 50 (13.7%) were third-year, and 39 (10.7%) were fourth-year students. Participants were chosen through a convenience sampling approach.

Data Collection Tools

Social Media Addiction Scale

The Social Media Addiction Scale (SMAS), created by Tutgun-Ünal (2015), contains 41 items. Scores range from 41 to 205, with the subscales being assessable independently from one another. The scale, which has four sub-factors including busyness, mood regulation, repetition, and conflict, is 5-point Likert type. Addiction levels are categorized as “No Addiction,” “Less Addicted,” “Moderately Addicted,” “Highly Addicted,” and “Very Highly Addicted.” This classification is based on dividing the score range from the SMAS and subscales into five equal segments (Tutgun-Ünal & Deniz, 2015). The internal consistency coefficient, Cronbach's alpha value, of the scale, which has no reverse scored items, was found to be in the range of 0.80 – 1.00, indicating that it is highly reliable. In this study, the sub-dimensions of preoccupation and mood regulation, whose dependency levels were found to be “moderately dependent,” were used.

Intolerance of Uncertainty Scale

The scale initially created by Carleton, Norton, and Asmundson (2007) was translated and modified into Turkish by Sarıçam, Erguvan, Akin, and Akça (2014). The Turkish version retains the original 12-item structure and utilizes a 5-point Likert-type rating system. This adaptation features a two-factor structure that accounts for 78.57% of the total variance. The first factor is labeled “prospective anxiety” and comprises seven items, while the second factor represents “inhibitory anxiety” with five items. The reliability coefficients (Cronbach's α) for these factors are 0.84 for prospective anxiety and 0.77 for inhibitory anxiety, with an overall internal consistency coefficient of 0.88 for the scale data.

Self-Regulation Scale

The Turkish adaptation of the five-point Likert-type Self-Regulation Scale, originally developed by Brown et al. (1999), includes seven sub-dimensions and consists of 63 items. This adaptation was conducted by Aydın et al. (2013) with a sample of 591 university students. To validate the construct of the scale, exploratory factor analysis was performed, resulting in a refined three-factor structure encompassing self-reinforcement, self-evaluation, and self-monitoring, totaling 51 items. The internal

consistency of the scale, as measured by Cronbach's alpha, was recorded at .87. Scores from the sub-dimensions reflect the participants' abilities in self-reinforcement, self-evaluation, and self-monitoring, while the overall score indicates general self-regulation skills. The scale permits a minimum score of 51 and a maximum score of 255, where elevated scores signify a high level of self-regulation capacity, and lower scores suggest diminished self-regulation abilities.

Data Analysis

In this study, which investigates the connections among self-regulation, IU, and SMA, correlation analysis, and descriptive statistics were initially conducted. Then, structural equation modeling (SEM) was conducted. With SEM, it was tested whether IU has a mediating role in the relationship between self-regulation and SMA. Two-stage SEM was used in the study. In the preliminary phase of the analysis, the measurement model, which examines the relationships between indicator and latent variables, was assessed. Following the measurement model, the hypothetical structural model was subjected to testing. To evaluate the fit of the models, several goodness-of-fit indices were utilized, including the chi-square to degrees of freedom ratio (χ^2/df), Comparative Fit Index (CFI), Normed Fit Index (NFI), Tucker – Lewis Index (TLI), and standardized root mean square residual (SRMR). The accepted critical thresholds were established as follows: $\chi^2/df < 5$, and CFI, NFI, and TLI > 0.90 , with SRMR < 0.08 (Tabachnick & Fidell, 2001). Model comparisons were conducted using the chi-square difference test for both partial and full models. Additionally, Akaike Information Criterion (AIC) and Expected Cross-Validation Index (ECVI) values were analyzed to select the optimal model among several options. The model with the lowest AIC and ECVI values was deemed the best fit (Browne & Cudeck, 1993). Furthermore, to assess the mediating role of IU in the relationship between self-regulation and SMA, a bootstrapping approach within SEM was utilized. This process involved resampling 10,000 iterations to generate coefficients and confidence intervals (Preacher & Hayes, 2008). If the confidence intervals did not include zero, the findings were considered statistically significant.

Results

Preliminary Analyses

Firstly, it was analyzed whether the variables were normally distributed. The skewness values ranged from .043 to .309, while kurtosis values varied between $-.254$ and $-.611$. Since these results fell within the normality criteria for skewness (± 2) and kurtosis (± 7), it was concluded that the variables were normally distributed (Finney & DiStefano, 2013). Table 1 presents the descriptive statistics for the sub-dimensions of self-regulation, IU, and SMA, along with the correlation analysis results for these study variables.

As shown in Table 1, self-regulation and IU $r(365) = -.27$, 95% C.A. $[-.24, -.04]$, SMA/occupation $r(365) = -.28$, 95% C.A. $[-.31, -.12]$ and mood regulation $r(365) = -.38$, 95% C.A. $[-.42, -.23]$ show significant negative relationships. On the other hand, significant positive relationships were found between intolerance of ambiguity and SMA/engagement $r(365) = .25$, 95% S.A. $[.15, .35]$ and SMA/mood regulation $r(365) = .32$, 95% S.A. $[.23, .41]$. In addition, busyness and mood regulation dimensions of SMA also

Table 1.
Descriptive Statistics and Reliabilities for the Study Variables

Variables	Descriptive Statistics and Reliabilities				Correlations		
	Mean	SD	Skewness	Kurtosis	1	2	3
1. Self-regulation	181.73	18.11	.309	-.358	-		
2. IU	39.51	8.06	.099	-.254	-.27**	-	
3. SMA occupation	34.04	9.21	.043	-.611	-.28**	.25**	-
4. SMA mood modification	12.94	4.87	.285	-.567	-.38**	.32**	.62**

Note: IU = Intolerance of uncertainty; SD = Standard deviation; SMA = Social media addiction.
***p* < .01.

showed a positive and strong relationship with each other, $r(365) = .62$, 95% S.A. [.56, .68].

Structural Equation Modeling

Measurement Model

The measurement model comprises three latent variables: self-regulation, IU, and SMA, along with seven observed variables that define these constructs. The analysis revealed acceptable goodness-of-fit indices for the measurement model, specifically $\chi^2(11, N = 365) = 51.69, p < .001$; CFI = 0.94; NFI = 0.92; IFI = 0.94; GFI = 0.96; and SRMR = 0.060. Factor loadings ranged from 0.32 to -0.28, with all loadings found to be significant. Given these results, it can be concluded that the measurement model is validated, indicating that the observed variables effectively represent the corresponding latent variables.

Structural Model

In the structural model, the first analysis tested the hypothesis that IU fully mediates the relationship between self-regulation and SMA among university students. In this fully mediated model, no direct pathway was established between self-regulation and SMA; instead, self-regulation’s influence was channeled through IU. The goodness-of-fit indices for this model indicated acceptable levels, with results as follows: $\chi^2(18, N = 365) = 94.42, p < .001$; CFI = 0.88; NFI = 0.86; TLI = 0.82; IFI = 0.88; GFI = 0.94; SRMR = 0.078; AIC = 130.42; and ECVI = 0.36. To identify the most suitable model, a subsequent analysis incorporated a model where IU served as a partial mediator, allowing for a direct

relationship between self-regulation and SMA. The results indicated that the goodness-of-fit indices for the partial mediation model were also at acceptable levels, with the findings as follows: $\chi^2(17, N = 365) = 61.58, p < .001$; CFI = 0.93; NFI = 0.91; TLI = 0.89; IFI = 0.93; GFI = 0.96; SRMR = 0.060; AIC = 99.58; and ECVI = 0.27.

All path coefficients in both models were determined to be significant. The chi-square difference test indicated a preference for the model with partial mediation, as the direct path added between self-regulation and SMA significantly enhanced the model ($\Delta\chi^2 = 32.837, df = 1, p < .001$). Furthermore, the AIC and ECVI values for the partial mediation model were lower than those of the full mediation model. In light of these findings, the model where IU partially mediates the relationship between self-regulation and SMA among university students was deemed preferable. The path coefficients for this selected model are presented in Figure 1.

Bootstrapping

The bootstrapping technique was utilized on the preferred partial mediation model identified in the SEM analysis. This technique aimed to provide further evidence regarding the significance of both direct and indirect paths within the model. The findings from the bootstrapping process, along with the results related to the study’s hypotheses, are detailed in Table 2.

Upon analyzing Table 2, it is evident that all direct path coefficients are significant following bootstrapping. Additionally, the indirect path coefficient is also significant (bootstrap coefficient

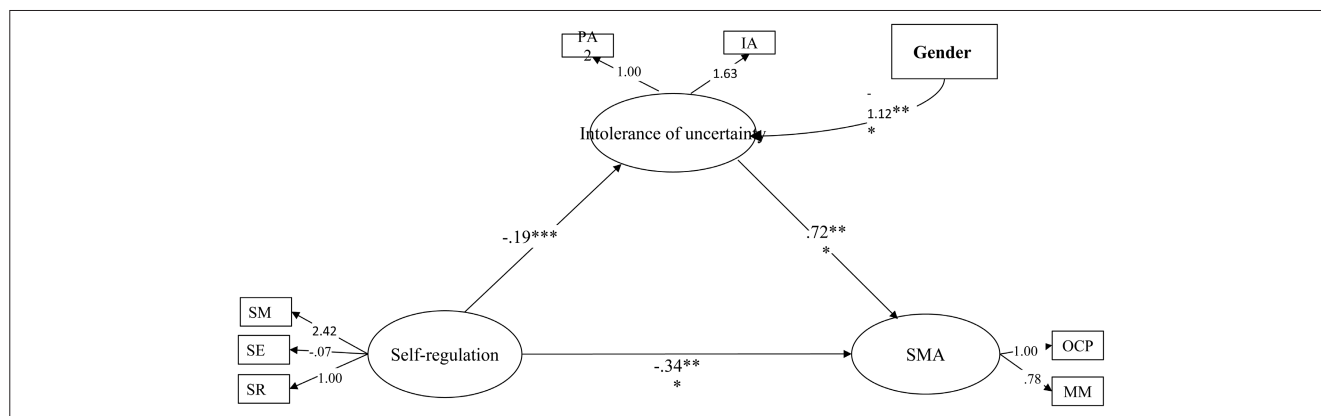


Figure 1. Standardized Parameter Estimates for the Partially Mediated Structural Model. Note: ****p* < .001; IA = Inhibitory anxiety; MM = Mood modification; OCP = Occupation; PA = Prospective anxiety; SE = Self-evaluation; SM = Self-monitoring; SR = Self-reinforcement.

Table 2.
Parameters and 95% Confidence Interval for the Paths of the Final

Model pathways	Estimated	95 % CI	
		Lower	Upper
Direct effect			
Self-regulation → SMA	-.276	-.432	-.122
IU → SMA	.316	.172	.473
Self-regulation → IU	-.349	-.459	-.254
Indirect effect			
Self-regulation → IU → SMA	-.135	-.272	-.052

Note: IU = Intolerance of uncertainty; SMA = Social media addiction.

= -.13, 95% confidence interval = -.27, -.05). Thus, it can be concluded that IU partially mediates the relationship between self-regulation and SMA among university students.

Discussion

This study examined the mediating effect of IU on the association between self-regulation and SMA. Structural equation modeling analyses indicated that IU partially mediates this relationship. Specifically, lower self-regulation is associated with increased IU, which in turn raises the likelihood of SMA. Additionally, diminished self-regulation directly predicts an increased risk of SMA.

Intolerance of uncertainty's mediating effect on the link between self-regulation and SMA is crucial for understanding individuals' psychological states. Self-regulation allows individuals to effectively control their target behaviors while also aiding them in coping with negative effects (Eisenberg et al., 2004). Insufficient self-regulation may lead to increased social media utilization, thereby raising addiction risk. Empirical findings indicate that decreased self-regulation is closely linked to heightened smartphone addiction, as self-regulatory deficits significantly contribute to this issue (Jeong et al., 2016). High self-regulation levels are associated with fewer complications in social media use, whereas low self-regulation elevates addiction risk, causing conflicts in goal orientation and fostering addiction.

Moreover, higher levels of self-regulation can mitigate the adverse impacts related to social media by fostering more adaptive patterns of use and improving overall well-being (Reinecke et al., 2022). Insufficient self-regulation, on the other hand, leads to problematic engagement with mobile social networking apps, resulting in cognitive concentration difficulties and an increased sense of necessity that can intensify addiction (Liu et al., 2022). These findings support previous studies, showing that people with good self-control can better manage their social media use and reduce negative effects.

Additionally, IU is linked to various mental health issues and may foster maladaptive coping strategies under stress, potentially increasing the risk for SMA (Qiu et al., 2024). A notable connection between SMA and IU has been identified (Rozgonjuk et al., 2019), indicating that individuals with high intolerance may resort to suppression strategies, adversely affecting their self-regulation. This may lead to difficulties in emotion regulation.

Developing self-regulation emerges as a crucial approach to reduce the adverse impacts of IU. Studies show that IU correlates with rumination and suppression, exacerbating anxiety and encouraging addictive behaviors (Sahib et al., 2024). Moreover, individuals exhibiting high IU risk losing self-regulation capabilities, especially in stressful contexts (Trofimov & Zabolotna, 2023).

The interplay between self-regulation and IU shapes individuals' responses to stress. According to self-regulation theory, individuals can effectively adapt their behaviors to achieve goals by managing their thoughts and emotions (Zimmerman, 2000; Brown et al., 1999). This skill enhances individuals' capacity to cope with internal situations and increases their adaptive capacity when facing external challenges. Uncertainty tolerance refers to the psychological resilience developed against unpredictable situations. During high-uncertainty conditions, such as a pandemic, strong self-regulation skills may reduce stress-induced distress and avoidance behaviors.

Research indicates that people exhibiting high self-regulation navigate monotony better in isolating environments, often channeling discomfort into creative endeavors (van Hooff & van Hooff, 2017). Additionally, factors like growth need strength can amplify the impact of self-regulation strategies on responses to uncertainty, fostering more functional behaviors in stressful contexts (Leventhal et al., 2020). Consequently, developing strategies to bolster resilience in the face of uncertainty is vital. Enhancing self-regulation could diminish the adverse effects of IU and strengthen resilience against SMA.

In conclusion, the association of self-regulation skills with IU provides crucial insights into addressing SMA. By improving self-regulation and building resilience against uncertainty, individuals may manage their social media interactions in a healthier manner.

Implications

The influence of IU on SMA highlights the need for focused interventions. Research suggests that social support can alleviate the negative effects of IU, with strong social networks providing a shield against addiction. Therefore, establishing psychological support and educational programs is vital for preventing SMA. Enhancing emotional resilience can be achieved by bolstering these support systems (Zhu, 2025).

Moreover, it is essential to explore the interactions between IU and emotional regulation, as previous studies have demonstrated that resilience and self-regulation may serve as buffering factors against the negative effects of IU. Cognitive reappraisal and mindfulness-based interventions have been found effective in reducing IU levels (Gullo et al., 2023). Cultural contexts also play a significant role; certain ethnic groups exhibit structured problem-solving approaches toward uncertainty (Banshchikova et al., 2022), suggesting that interventions should be tailored to cultural dynamics.

Additionally, cognitive reappraisal and mindfulness strategies have been shown to decrease IU by improving emotional regulation (Clayton et al., 2023). Therapies focused on emotional regulation can diminish IU levels in individuals with anxiety disorders, while enhanced self-regulation positively impacts anxiety (Sahib et al., 2024). However, inherent cognitive biases necessitate a multifaceted treatment approach. Furthermore, the addictive features of social media platforms can hinder self-regulation efforts (Zhu, 2025).

Despite the prevalence of addiction among individuals with high IU, psychological resilience and social support are critical in this relationship. Morriss et al. (2023) highlight that IU is linked to various emotional responses, making it a significant focus for improving emotional health. Grasping IU improves treatment strategies for emotional disorders and aids in creating personalized support plans, crucial for safeguarding individuals against SMA. Therefore, while improving emotional regulation is crucial, the individual's cultural background and social support system must also be accounted for.

Limitations and Directions/Suggestions for Future Research

This research has various limitations. Firstly, the sample consists exclusively of young adult university students, which limits the applicability of findings given the rising social media use among various age groups (Primack et al., 2017). Future research should explore SMA risks across a broader demographic to enhance generalizability and understanding of the issue.

Secondly, reliance on quantitative self-report measures could be augmented with qualitative methods. Future research could benefit from integrating diverse data collection methods and employing longitudinal or experimental designs to improve the investigation of causal connections among variables. Such methodological advancements would facilitate a more comprehensive analysis of the findings and yield more robust results. Overall, addressing these limitations is crucial for a thorough exploration of SMA, and future studies should aim to produce more comprehensive and valid datasets.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

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ORIGINAL ARTICLE

Internet Addiction, Social Media Addiction, and Nomophobia in Social Media Managers: What Is Their Relationship with Personality Traits?

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Main Points

- Social media managers can be considered a risk group in terms of developing behavioral addictions due to their work.
- Agreeableness, neuroticism, and openness were found to be positive predictors of internet addiction in social media managers.
- Agreeableness and neuroticism are positive significant predictors of social media addiction in social media managers.
- Agreeableness, neuroticism, and openness are positive significant predictors of nomophobia in social media managers.
- These results suggest that these personality traits are risk factors for developing behavioral addictions.

Abstract

Excessive and pathological use of the internet, social media, and smartphones increases the risk of behavioral addiction. Social media managers are constantly online because of their work and responsibilities, which suggests that they are a risk group for developing behavioral addictions. It has been stated in the literature that personality traits are a potential source of many problematic behaviors related to addiction. The current study examined the role of personality traits on internet addiction, social media addiction, and nomophobia in social media managers. In this predictive correlational study, the research group comprises 218 social media managers working in public and private institutions in different provinces of Türkiye. According to the results of multiple regression analyses conducted separately for each dependent variable, personality traits (extraversion, agreeableness, conscientiousness, neuroticism, openness) together exhibited a significant relationship with internet addiction, social media addiction, and the sub-dimensions of nomophobia. The five personality traits together explained 41% of the variance in internet addiction, 21% of the variance in social media addiction, and 14% of the variance in nomophobia. Based on the results obtained, the current study can provide insights into the risk factors for developing behavioral addictions in social media managers.

Keywords: Internet addiction, nomophobia, personality traits, social media addiction

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Introduction

The internet is a multidimensional and diverse environment that offers a multitude of experiences as a product of a specific virtual space (Ryding & Kaye, 2018). As of 2025, 5.56 billion people use

the internet, equal to 67.9% of the world's population; there are 5.24 billion active social media users worldwide, equal to 63.9% of the world's population; and 5.78 billion people use mobile phones, equal to 70.5% of the world's population (We Are Social, 2025). According to the Turkish Statistical

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Institute (2025) the internet usage rate in Türkiye in 2024 is documented as 88.8% among individuals aged 16–74. This indicates that the use of the internet, computers, smartphones, and other electronic devices and the amount of time individuals spend online are increasing. The increasing use and prevalence of new technological devices such as personal computers, tablets, smartphones, and virtual communication are causing changes in individuals' daily habits and behaviors (King et al., 2013). At this point, internet technology has a leading position in the world of information technology in terms of its depth and breadth in information branches. However, the computerization of society is recognized as one of the main factors affecting human health. Widespread access to the internet has significantly changed daily life due to the wide range of opportunities and services offered by the web. However, excessive or pathological use has also led to behavioral addictions (Tikhonov & Bogoslovskii, 2015). The concept of addiction has expanded recently to include many addictive behaviors and is not limited to behaviors related to the abuse of substances (Kuss & Pontes, 2019). In this context, it is emphasized that addiction is not only caused by various substances but also by contact with digital technologies (Rachubińska et al., 2021).

Internet addiction, which is one of the behavioral addictions and is increasingly recognized as a health problem in many parts of the world (Elik & Karadeniz, 2025; Zivnuska et al., 2019), is considered an internet use behavior pattern that includes a dysfunctional desire to use the internet irregularly and for excessive periods (Kuss & Pontes, 2019). Internet addiction is described as a global concern by Ryding & Kaye (2018) and is characterized by an individual's obsessive desire to access the internet while offline and the inability to go offline while online (Tikhonov & Bogoslovskii, 2015). Since the internet is the active ingredient of social media addiction and smartphone addiction, it is stated that internet addiction is highly related to these addictions (Savcı & Aysan, 2017).

Social media addiction is another behavioral addiction and is considered a type of internet addiction in some studies in the literature (Andreassen et al., 2017; Kuss & Pontes, 2019; Ezung & Baksh, 2024). While social media use is associated with both drawbacks and benefits to mental and social well-being, it can also lead to addictive social media use (Santini, 2024). Social network sites (SNSs) can significantly affect individuals' lifestyles, communication, interests, and psychology, especially as online interaction becomes more used than face-to-face interaction for many individuals (Sheinov, 2021). Moreover, the nature of social media can lead to compulsive behaviors, a level of behavioral addiction that can interfere with daily functioning and productivity (Zivnuska et al., 2019). Therefore, ubiquitous SNSs and easy access to the internet increase the risk of social media addiction (Hou et al., 2019). Social media addiction is defined as being overly concerned about social media, driven by an uncontrollable motivation to log on to or use social media, and devoting so much time and effort to social media that it impairs other important life areas (Andreassen & Pallesen, 2014). According to another definition, it is the excessive use and habitual monitoring of social media, manifested in compulsive usage that comes at the expense of other activities (Zivnuska et al., 2019).

Today, smartphones facilitate instant communication with their numerous features, help individuals stay connected anytime and anywhere, and provide individuals with constant access to information (Yıldırım & Correia, 2015). The prevalence of nomophobia ranges from 6% to 73% among various populations (León-Mejía et al., 2021). The increasing popularity of smartphones has led to many problems due to overuse and addiction to smartphones, which has led to the development of a phobia called nomophobia (Chhabra & Pal, 2020). Nomophobia (No MOBILE PHoNE PhoBIA - a combination of the words “no mobile phone” and “phobia”), which refers to the anxiety or fear that individuals experience when they do not have or cannot use their smartphones, was first introduced in 2008 and is considered a modern phobia (Notara et al., 2021). King et al. (2010) consider nomophobia a 21st-century disorder caused by new technologies. In this context, nomophobia is a form of behavioral addiction to the smartphone, which refers to the anxiety caused by disconnection from the mobile network or the inability to access the smartphone (Anshari et al., 2019).

In today's world of rapid development and communication, the most important factor that enables institutions and organizations to keep pace with these changes is the effective use of SNSs (Kasap, 2021). Public and private sector institutions and organizations that want to benefit from SNSs in a more effective, efficient, and professional manner employ expert staff or outsource services (Köseoğlu & Aydın, 2022). In this context, many institutions and organizations take measures to protect the image of their institutions in virtual environments by hiring communication experts such as social media managers (Eşitti & Işık, 2015). Moretti & Tuan (2015) state that social media managers have gained an active and important role for institutions and organizations in this process. Social media managers use SNSs strategically in communication, receive training in this field, and follow the latest information communication technologies (Linke & Zerfass, 2013). It also improves organizations' social media strategies by changing traditional practices and engaging with various stakeholders in an easier, faster, and more efficient way (Moretti & Tuan, 2015). Therefore, due to their work and responsibilities, they follow current news and information, create various content, provide feedback (comments, messages, etc.) to maintain two-way communication, follow trends and user behaviors on SNSs, and therefore are constantly online both on their phones and computers. This shows that they need to be connected to the internet frequently as part of their work and that this use is “compulsory.” In this context, considering that social media managers are a risk group at the point of developing behavioral addictions, it is important to evaluate these increasing addictions in a sample of social media managers.

Servidio (2014) states that personality refers to all aspects of individuality and that individuals' activities and behavior types are consistent with certain characteristics of personality. Zilberman et al. (2018) also state that personality traits are the potential source of many problematic behaviors related to addiction. Especially the increase in the prevalence of behavioral addictions worldwide makes it important to identify individual risk and protective factors for these addictions (Valero-Solís, 2018). However, individuals who are addicted to the internet, computer games, and social media are significantly different from non-addicted

individuals in terms of personality trait levels (Rachubińska et al., 2021). Furthermore, it is emphasized that personality traits play a role in the development and maintenance of these addictions, even though behavioral addictions appear to be very different from one another (Sayan-Karahan, 2023).

In addition to the terms “internet addiction,” “social media addiction,” and “smartphone addiction,” the term “problematic use” is also widely used in the literature. However, empirical studies are increasingly defining internet addiction, social media addiction, and nomophobia as independent constructs and explicitly point out that, although they are not officially recognized by the WHO (World Health Organization), APA (American Psychological Association), DSM-5 (Diagnostic and Statistical Manual-5), or ICD-11 (International Classification of Diseases-11), they are serious and problematic pathologies (Lozano-Blasco et al., 2022; Santini et al., 2024; Al-Mamun et al., 2025). In this study, the term “addiction” was used in line with the relevant theoretical and empirical studies in the field to refer to specific behavioral addictions. In this context, the use of the term “addiction” rather than “problematic use” in this study is a deliberate choice, and these concepts were preferred for the conceptual and methodological consistency of the study.

Behavioral addictions have become widespread with the increasing use of technology in society. Behavioral addictions have physical, psychological, and social effects on individuals, and personality traits of individuals can affect addictive behaviors. Determining the personality traits of social media managers who experience internet addiction, social media addiction, and nomophobia, examining their predictors, and investigating which personality traits are effective in these behavioral addictions are considered very important. Developing a healthy and adaptive personality can be an important and effective way to struggle with behavioral addictions. Therefore, the current study aims to examine the role of personality traits in internet addiction, social media addiction, and nomophobia among social media managers.

In line with this aim, the following research questions were examined:

1. Do personality traits (extraversion, agreeableness, conscientiousness, neuroticism, openness) significantly predict internet addiction?
2. Do personality traits (extraversion, agreeableness, conscientiousness, neuroticism, openness) significantly predict social media addiction?
3. Do personality traits (extraversion, agreeableness, conscientiousness, neuroticism, openness) significantly predict nomophobia?

Material and Methods

Participants

In this study, which was carried out with predictive correlational research, the research group consisted of 218 social media managers, 69 (31.7%) females and 149 (68.3%) males, working in public and private institutions in different provinces of Türkiye. The participants’ ages ranged from 20 to 55, and the mean age was 35.07 years (standard deviation [SD] = 6.97). In addition, 181 (83%) of the participants work in public institutions, and 37

Table 1.
Descriptive Information About Participants

Variables	Features	N	%
Gender	Female	69	31.7
	Male	149	68.3
Type of organization	Public	181	83.0
	Private	37	17.0
Daily social media usage times	0 – 1 hour	17	7.8
	1 – 3 hours	64	29.4
	3 – 6 hours	73	33.5
	6 hours and more	64	29.4
Daily internet usage times	0 – 1 hour	3	1.4
	1 – 3 hours	41	18.8
	3 – 6 hours	70	32.1
	6 hours and more	104	47.7
Daily smartphone usage times	0 – 1 hour	3	1.4
	1 – 3 hours	42	19.3
	3 – 6 hours	81	37.2
	6 hours and more	92	42.2
Daily frequency of checking the smartphone	1 – 10 times	9	4.1
	11 – 20 times	31	14.2
	21 – 40 times	83	38.1
	40 times and more	95	43.6
The social media platform that spends the most time	Facebook	11	5.0
	Twitter	75	34.4
	Instagram	120	55.0
	YouTube	12	5.5
Whether or not you see yourself as and internet / social media addict	Yes	64	29.4
	Undecided	73	33.5
	No	81	37.2

(17%) work in private institutions. Table 1 summarizes detailed descriptive information about the participants.

Measures

Personal Information Form: The personal information form prepared by the researchers included questions about gender, age, type of organization, daily social media, internet and smartphone usage times, daily frequency of checking the smartphone, the social media platform where the participants spent the most time, and whether the participants considered themselves internet/social media addicts. For the participants to answer more easily and for the confidentiality of the information, name information is not included in the form.

Internet Addiction Scale: The scale designed by Hahn & Jerusalem (2001) and adapted to Turkish by Şahin & Korkmaz (2011) is a 5-point Likert-type scale. It consists of 19 items and three sub-dimensions: loss of control, desire to stay online more, and negativity in social relationships. In the reliability analyses, Cronbach’s alpha internal consistency coefficient was .85 for the

overall scale and .90, .88, and .92 for the sub-dimensions, respectively. As a result of confirmatory factor analysis, goodness-of-fit values indicated acceptable fit ($\chi^2 = 580.17$; $df = 149$; Root Mean Square Error of Approximation (RMSEA) = .079; Standardized Root Mean Square Residual (SRMR) = .045, Goodness of Fit Index (GFI) = .90, Adjusted Goodness of Fit Index (AGFI) = .85, Comparative Fit Index (CFI) = .97, Non-Normed Fit Index (NNFI) = .96, Incremental Fit Index (IFI) = .95; Şahin & Korkmaz, 2011). In the current study, Cronbach's alpha internal consistency coefficient of the scale was found to be .94.

Social Media Addiction Scale: The scale developed by Tutgun-Ünal & Deniz (2015) is a 5-point Likert scale consisting of 41 items. The scale has four factors which explain 59% of the total variance. The highest point obtained from the scale is 205; the lowest is 41. The sub-dimensions can be assessed among themselves. The sub-dimensions are labeled occupation, mood modification, relapse, and conflict. In the reliability analyses, the Cronbach's alpha internal consistency coefficient of the scale was found to be .97, and the sub-dimensions were found to be .93, .89, .91, and .96, respectively (Tutgun-Ünal & Deniz, 2015). In the current study, Cronbach's alpha internal consistency coefficient of the scale was found to be .97.

Nomophobia Scale: The scale developed by Yıldırım & Correia (2015) and adapted into Turkish by Yıldırım et al. (2016) is a 7-point Likert-type scale. It consists of 20 items and four sub-dimensions: not being able to communicate, losing connectedness, not being able to access information, and giving up convenience. In the reliability analysis, the Cronbach's alpha internal consistency coefficient of the scale was found to be .92, and the four sub-dimensions were found to be .90, .74, .94, and .91, respectively. Confirmatory factor analysis indicated that the model received acceptable values ($\chi^2/df = 2.86$, CFI = .92, RMSEA = .08; Yıldırım et al., 2016). In the current study, Cronbach's alpha internal consistency coefficient of the scale was found to be .96.

International Personality Inventory Short Form: The scale developed by Goldberg (1999) and adapted to Turkish by Yöyen (2016) based on the Five Factor Personality Model created by Costa and McCrae is a 5-point Likert-type scale. It consists of 40 items and five sub-dimensions with two ends. The subscales are "extraversion – introversion," "conscientiousness – disorganization," "emotional stability – instability," "openness to experience – closeness to experience," "agreeableness – hostility." In the reliability analysis, the Cronbach's alpha internal consistency coefficient of the overall scale was .82; the sub-dimensions were found to be .74, .70, .75, .68, and .55, respectively. Confirmatory factor analysis showed that the model exhibited a good fit ($\chi^2/df = 2.40$, RMSEA = .051, RMR = .099, CFI = .77, GFI = .85, AGFI = .86; Yöyen, 2016). In the current study, Cronbach's alpha internal consistency coefficient for the total scale was found to be .83; for the extraversion dimension, .77; for the emotional instability dimension, .83; for the conscientiousness dimension, .77; for the openness dimension, .73; and for the agreeableness dimension, .70.

Procedure

Permission for all scales to be used in the study was obtained via e-mail from the researchers who developed/adapted the scales. Ethics Committee Approval was obtained from Artvin Coruh

University Scientific Research and Publication Ethics Committee dated March 2, 2022 and numbered E-18457941-050.99-41684 for the conduct of the research. Scale instruments based on self-reporting were administered to the participants. The researchers informed all participants about the aims of the study before the administration of the measurement instruments. Participation in the study was voluntary, and informed consent was obtained from each participant. The administration of the measurement instruments was completed in 20 minutes. The data in this study was collected between March and October 2024.

Data Analysis

In the study, multiple regression analysis was performed to determine the predictive role of personality traits (extraversion, agreeableness, conscientiousness, neuroticism, openness) on internet addiction, social media addiction, and nomophobia. Multiple regression analysis was employed to simultaneously evaluate the effects of independent variables on the dependent variable. Within the scope of the research, a series of statistical adjustments (Field, 2016) were made before analyzing the data. In this context, missing value analysis was completed first, and then normality, multicollinearity, autocorrelation, linearity, and residual values were checked for the assumptions of multiple regression analysis. The analysis of the data was carried out using the IBM SPSS Statistics v26.0 (IBM SPSS Corp.; Armonk, NY, USA) package program.

Results

Preliminary Analyses

Before starting the analysis, the assumptions of the multiple regression analysis were checked. First, the missing value analysis was completed, and in this context, frequency analysis was performed, and it was determined that there was no missing value in the data set. Then, it was observed that the skewness values examined to determine whether the variables met the normal distribution assumption ranged between -0.81 and 0.64 , and the kurtosis values ranged between -1.00 and 0.24 . Skewness and kurtosis values between -2.00 and $+2.00$ indicate that the data are normally distributed (George & Mallery, 2010). According to these values, it can be assumed that the data show a normal distribution. Then, multicollinearity, variance inflation factor (VIF), tolerance values, and residual values were examined. Considering the information that the correlation coefficients between the independent variables should be less than 0.80 (Field, 2024), it is seen that the relationships between the variables are below this criterion when Table 2 is examined. This result shows that there is no problem of multicollinearity.

When Table 2 is examined, it is seen that there is a positive significant relationship between internet addiction and social media addiction ($r = .72$, $p < .01$), nomophobia ($r = .66$, $p < .01$), agreeableness ($r = .31$, $p < .01$), neuroticism ($r = .50$, $p < .01$) and openness ($r = .35$, $p < .01$) variables; there is a positive significant relationship between social media addiction and nomophobia ($r = .62$, $p < .01$), agreeableness ($r = .17$, $p < .05$) and neuroticism ($r = .43$, $p < .05$) variables; and there is a positive significant relationship between nomophobia and agreeableness ($r = .23$, $p < .01$), neuroticism ($r = .23$, $p < .01$) and openness ($r = .26$, $p < .01$) variables.

Table 2.
Descriptive Statistics, Correlations, and Reliabilities Among Study Variables

	1	2	3	4	5	6	7	8
1. Internet addiction	1							
2. Social media addiction	.72**	1						
3. Nomophobia	.66**	.62**	1					
4. Extraversion	.12	-.03	.07	1				
5. Agreeableness	.31**	.17*	.23**	.56**	1			
6. Conscientiousness	.02	-.05	.10	.26**	.34**	1		
7. Neuroticism	.50**	.43**	.23**	-.24**	.02	-.18**	1	
8. Openness	.35**	.09	.26**	.50**	.43**	.44**	-.00	1
Mean	55.38	93.32	74.71	29.28	30.48	36.62	23.48	27.16
Standard deviation	8.75	32.69	30.42	5.59	4.93	5.61	6.55	4.41
Skewness	.10	.64	.16	-.39	-.44	-.81	-.06	-.53
Kurtosis	-.24	-.03	-1.00	-.24	-.41	.24	-.68	-.46

* $p < .05$.
** $p < .01$.

However, it was found that VIF values calculated separately for internet addiction, social media addiction, and nomophobia variables were between 1 and 1.85, and tolerance values were between .54 and 1. Accordingly, since the VIF values are less than 10 and the tolerance values are greater than .20 (Field, 2024), it can be said that all values are at an acceptable level. In addition, the Durbin-Watson value was found to be 1.98 for internet addiction, 2.02 for social media addiction, and 1.96 for nomophobia, and these values showed that there was no autocorrelation. When the scatter plot of the predicted standardized values (Z -Predicted) and standardized residual values (Z -Residuals) for all analyses was examined, it was seen that the points on the graph were randomly scattered around the 0 value, and the errors were normally distributed. For the linearity assumption, the scatter plot matrix was examined, and it was seen that ellipse-shaped distributions were obtained. These results show that the linearity assumption was met. After all assumptions were met, multiple regression analysis was performed.

Multiple Regression Analysis

In multiple regression analysis, internet addiction, social media addiction, and nomophobia were used as dependent variables, and personality traits (extraversion, agreeableness, conscientiousness, neuroticism, openness) were used as independent variables. Separate analyses were conducted for each dependent variable.

When Table 3 is examined, it is seen that internet addiction and personality traits (extraversion, agreeableness, conscientiousness, neuroticism, openness) exhibit a significant relationship ($R^2 = .414$, Adjusted $R^2 = .400$; $F_{(5,212)} = 29.96$, $p < .01$). These five variables together explain 41% of the variance in internet addiction. When the variables in the model are examined, agreeableness ($\beta = .20$, $p < .01$), neuroticism ($\beta = .48$, $p < .01$), and openness ($\beta = .32$, $p < .01$) are seen to be positive significant predictors of internet addiction.

It was observed that social media addiction and personality traits (extraversion, agreeableness, conscientiousness, neuroticism,

openness) exhibited a significant relationship ($R^2 = .213$, Adjusted $R^2 = .194$; $F_{(5,212)} = 11.45$, $p < .01$). These five variables together explain 21% of the variance in social media addiction. When the variables in the model are examined, agreeableness ($\beta = .18$, $p < .05$) and neuroticism ($\beta = .41$, $p < .01$) are seen to be positive significant predictors of social media addiction.

It was observed that nomophobia and personality traits (extraversion, agreeableness, conscientiousness, neuroticism, openness) exhibited a significant relationship ($R^2 = .140$, Adjusted $R^2 = .120$; ($F_{(5,212)} = 6.92$, $p < .01$). These five variables together explained 14% of the variance in nomophobia. When the variables in the model are examined, agreeableness ($\beta = .19$, $p < .05$), neuroticism ($\beta = .20$, $p < .01$), and openness ($\beta = .23$, $p < .01$) are seen to be positive significant predictors of nomophobia.

Discussion

The main purpose of this study is to examine the role of personality traits on internet addiction, social media addiction, and nomophobia in social media managers. Personality traits are seen as particularly important when considering the theory that addiction shapes personality and leads to a dependent personality. Attempts to understand addiction-related personality traits are ongoing and are being investigated in different addiction samples (Rachubińska et al., 2021; Zilberman et al., 2018). The current study is very important in terms of examining the behavioral addictions of social media managers, who are a risk group, and revealing which personality traits are effective in these behavioral addictions. The personality traits identified in this study can be considered both protective and risk factors.

The study found that neuroticism is a positive predictor of both internet addiction and social media addiction. The literature shows that neuroticism is the most consistent evidence linking internet addiction and personality traits. In fact, many studies have linked internet addiction (Marciano et al., 2022; Zhang, 2021) and social media addiction (Huang, 2022; Marengo et al.,

Table 3.

Multiple Regression Analysis Results on the Prediction of Internet Addiction, Social Media Addiction, and Nomophobia by Personality Traits

Variables		Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness	R ²	Adj R ²	SE	F _(dfn, dfd)
Internet addiction	B	-.02	.36	-.16	.64	.63	.414	.400	6.78	29.96 _(5,212)
	SE	.11	.12	.10	.08	.13				
	β	-.01	.20	-.10	.48	.32				
	t	-.14	3.01**	-1.66	8.44**	4.75**				
Social media addiction	B	-.29	1.19	-.27	2.02	.41	.213	.194	29.35	11.45 _(5,212)
	SE	.49	.52	.41	.33	.58				
	β	-.05	.18	-.05	.41	.06				
	t	-.59	2.30*	-.65	6.15**	.71				
Nomophobia	B	-.52	1.13	-.01	.94	1.59	.140	.120	28.54	6.92 _(5,212)
	SE	.47	.50	.40	.32	.56				
	β	-.10	.18	-.00	.20	.23				
	t	-1.11	2.24*	-.03	2.92**	2.84**				

* $p < .05$.

** $p < .01$.

B = Unstandardized Coefficient, SE = Standard Error, β = Beta, Standardized Coefficient, t = t-value

2020) to neuroticism. It is claimed that neuroticism may be a personality trait that increases the risk of internet addiction and that addicted individuals are more prone to have high neuroticism (Rachubińska et al., 2021). Social media managers work in a constantly changing and highly interactive environment, managing the online processes of the institutions and organizations they represent, and they maintain constant control over comments, likes, shares, and interactions. This situation can lead to high performance expectations for social media managers. In addition, social media managers are exposed to the opinions and criticism of many people in their work. People with high levels of neuroticism may be more sensitive to expectations, negative comments, criticism, or content that has received fewer likes. This can be a serious source of anxiety at work and lead to a constant need to be online. Considering that anxiety is an aspect of neuroticism, these individuals may overly focus on comments and likes they receive on social media posts due to their strong anxiety, which can lead to constant use of the internet and social media. At this point, it can be stated that neuroticism is a risk factor for both internet and social media addiction.

The study found that agreeableness is a positive predictor of both internet addiction and social media addiction. In studies that found a negative relationship between the variables, agreeableness is considered a protective factor in both internet addiction and social media addiction (Kuss et al., 2013; Huang, 2022). The findings obtained from the current study show that there is a positive relationship between the variables, indicating that agreeableness can also be considered a risk factor and providing a new perspective to the literature. This makes it important to repeat the research on the subject in different samples and to obtain more consistent results. Agbaria & Bdier (2019) concluded that there is a positive relationship between internet addiction and agreeableness, suggesting that high levels of agreeableness may be related to pleasing others, leading to internet overuse due to the desire to be accessible to others. Social media managers

may also try to please their stakeholders, target audiences, and managers by producing content intensively to gain their approval and consent and avoid conflicts with them. This intensive work may lead social media managers to excessive internet and social media use.

The study found that openness was a positive predictor of internet addiction. In the literature, while some studies conclude that there is a positive relationship between internet addiction and openness (Rachubińska et al., 2021; Servidio, 2014), there are also studies proving a negative relationship between the two variables (Randler et al., 2014; Tian et al., 2021). Due to its interactive nature, the internet offers access to various environments and activities. These activities may attract more attention from individuals who are open to experience, as they can use the internet to satisfy their curiosity. In addition, the internet can also meet the need of these individuals to seek novelty and have new experiences, as it constantly offers information. Considering that individuals who are open to experience prefer diversity, innovations, change, and creative thinking, social media managers with a high level of openness may attach more importance to making different and remarkable posts and developing innovative ideas to stand out on SNSs. New experiences, new social media platforms, and interaction with different social groups, communities, and individuals can increase the interest of individuals who are open to experience in the online world. This can lead to a constant search for content production and interaction. In addition, individuals who are open to experience may be inclined to explore innovative and creative content on the internet. Making these discoveries in an uncontrolled manner can cause excessive internet use and create addiction.

Another result obtained from this study is that agreeableness, neuroticism, and openness are positive significant predictors of nomophobia. Studies in the literature confirm the positive relationship between nomophobia and agreeableness (Öz & Tortop,

2018), neuroticism (Uguz & Bacaksız, 2022), and openness (Nasran & Seman, 2024). Today, smartphones are more accessible, easier to use, and more practical than other internet-based devices, making connections to the internet and SNSs timeless and spaceless. Social media managers also follow the news, create content in line with trends, adapt to innovations, evaluate feedback from stakeholders and target groups, control and analyze the performance of content, develop online strategies, manage campaigns, increase access to stakeholders and target audiences, carry the organization's brand and corporate identity to social media, and make online media planning. To achieve these goals, they may need to use smartphones intensively as they are more accessible. As discussed above, internet addiction and social media addiction have been associated with neuroticism, agreeableness, and openness. Since smartphones are also used to access the internet and social media platforms, the association of these personality traits with nomophobia can be considered an expected situation.

Limitations and Directions/Suggestions for Future Research

This is the first study to examine personality traits and different behavioral addictions such as internet addiction, social media addiction, and nomophobia in a sample of social media managers. Based on the results obtained, the current study can provide insights into the risk factors for social media managers to develop behavioral addictions. The current study was conducted with social media managers working in different private/public institutions and organizations. The heterogeneity in sample selection can be considered a limitation. In future research, the behavioral addictions of social media managers with a sectoral focus (e.g., social media managers only in local governments or only in private organizations) and their relationship with different personality traits can be examined. However, in future studies, comparative analyses can be conducted on different behavioral addictions and personality traits of social media managers working in private organizations and those working in public organizations. Another limitation of this study is that it deals with internet addiction, social media addiction, and nomophobia among behavioral addictions. It may be recommended to conduct research examining the role of different behavioral addictions in personality traits.

However, some practical suggestions can be made for social media managers. Social media managers spend a large part of their time on tasks such as content creation, analysis processes, agenda and trend tracking, and campaign management. This is where artificial intelligence – powered tools and applications can save time and labor and support social media managers. In addition, social media managers can develop an awareness of the conscious, balanced, and safe use of digital technologies by participating in various digital awareness training programs and receiving educational support on preventing behavioral addictions. Considering that social media managers usually earn their living through these platforms, the management of institutions and organizations can be encouraged to define corporate values that prioritize the digital health of social media managers within institutional and organizational policies.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to restrictions (e.g., their containing information that could compromise the privacy of research participants).

Ethics Committee Approval: Ethics committee approval was received from the Scientific Research and Publication Ethics Committee of Artvin Coruh University (Approval no: E-18457941-050.99-41684 Date: March 2, 2022).

Informed Consent: Informed consent was obtained from the participants who agreed to take part in the study.

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ORIGINAL ARTICLE

Gambling Addiction and Suicide: A 10-Year Autopsy-Based Retrospective Analysis

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Main Points

- This study represents one of the first autopsy-based series in Türkiye to investigate gambling-related suicides over a 10-year period.
- Male sex, young age (particularly 18 – 30 years), indebtedness, bipolar disorder, and online gambling behaviors emerged as key risk factors.
- Debt, especially unsecured debt, appears to play an important triggering role in gambling-related suicides.
- The findings highlight the need for multidisciplinary risk assessments that include economic and social dimensions, stronger regulatory frameworks, and targeted prevention strategies.

Abstract

This study retrospectively examined suicides associated with gambling disorder through a multidimensional evaluation of sociodemographic features, psychiatric comorbidities, suicide methods, and toxicological findings. Case files from Council of Forensic Medicine between September 2015 and September 2025 were reviewed. All autopsy cases classified as suicide or suspected suicide with documented gambling history or gambling-related debt were included. A total of 24 cases were identified, of whom 87.5% were male and one-third aged 18 – 30. Almost all cases (91.7%) had documented debts, usually bank loans or unspecified debts, and over half (54.2%) had intrafamilial problems. Bipolar disorder was the most frequent psychiatric diagnosis (66.7%), while 29.2% had prior suicide attempts. Online gambling was present in one-third of cases, associated with younger age, male sex, and a higher likelihood of hanging. Drug intoxication (37.5%) and hanging (25.0%) were the main methods, while alcohol and substance positivity were detected in 33.3% and 29.2% of cases. Findings highlight the convergence of financial strain, psychiatric disorders, and gambling behaviors, with young men emerging as a vulnerable group. These results underscore the urgency of multidisciplinary assessments and stronger regulatory frameworks. Prospective large-scale studies are also needed to refine risk profiles and guide effective prevention strategies.

Keywords: Autopsy, gambling addiction, online gambling, psychiatric comorbidity, suicide

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Introduction

Gambling disorder has increasingly been recognized as a significant and escalating public health concern with profound individual and societal implications. Its impact extends beyond financial devastation

and social marginalization, as it frequently coexists with emotional dysregulation and psychiatric comorbidities, thereby creating a critical pathway toward fatal outcomes (Kristensen et al., 2025; Oruç et al., 2022). Over the past decade, a growing body of research has underscored the heightened risk of

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suicide among individuals with gambling disorder (Kidane et al., 2025; van der Maas et al., 2024). Epidemiological studies consistently demonstrate that the prevalence of suicidal ideation and attempts is markedly elevated in this population compared with the general population (Marionneau & Nikkinen, 2022; Wong et al., 2010).

In particular, the rapid expansion of online gambling has created even higher risk profiles, especially among young men, due to its easy accessibility, anonymity, and the potential for rapid indebtedness. These features differentiate online gambling from traditional forms and may intensify vulnerability to suicidal behavior in this subgroup (Vijayakumar & Vijayakumar, 2023). The strong association between gambling-related suicides and psychiatric comorbidities has been frequently emphasized in the literature. Depression, anxiety disorders, and substance use disorders are among the most commonly observed psychiatric conditions in this population (Reynolds et al., 2025). In a retrospective psychological autopsy study conducted in Hong Kong, it was reported that all suicide victims with pathological gambling had unpayable debts, and 82.4% of them presented with either depression or a substance use disorder (Wong et al., 2010). Furthermore, socioeconomic adversity, psychiatric illness, and interpersonal conflicts have been identified as key determinants of gambling-related suicides. A large-scale national case-control study from Sweden analyzed suicide and mortality rates among individuals diagnosed with gambling disorder in relation to socioeconomic factors and comorbid conditions. The findings demonstrated that gambling disorder itself constituted a significant independent risk factor; however, the presence of psychiatric comorbidities and socioeconomic disadvantages markedly amplified this risk (Blaszczynski & Marfels, 2003; Karlsson & Håkansson, 2018). Evidence from Australia and the United Kingdom further suggests that a substantial proportion of gambling-related deaths remains insufficiently addressed in forensic investigations, highlighting the need for a stronger legal framework to clarify the role of betting companies and financial debts in fatal outcomes (Blaszczynski & Marfels, 2003; Rintoul et al., 2023).

This study aims to retrospectively examine suicide cases associated with gambling disorder by conducting a multidimensional evaluation of their sociodemographic characteristics, suicide methods, toxicological findings, and psychiatric histories. A systematic analysis of forensic medicine – based data provides a unique opportunity not only to delineate clinical risk factors but also to elucidate how financial, psychiatric, and social dynamics converge to produce fatal outcomes. In doing so, the study is expected to address important gaps in the literature regarding the link between gambling disorder and suicide, thereby contributing to the development of multidimensional risk assessment models and targeted prevention strategies. Such an approach holds the potential to offer valuable insights for clinicians, as well as for forensic and social policymakers, enabling more effective interventions against this increasingly critical public health challenge.

Material and Methods

Study Design and Setting

This study was designed as a retrospective, descriptive analysis and was conducted at the Council of Forensic Medicine. The study covered the period between September 1, 2015, and September 1, 2025,

and included all autopsy cases with evidence of gambling history or gambling-related debt that were investigated under suspicion of suicide. The main objective was to describe sociodemographic, clinical, and forensic-toxicological characteristics of these cases.

Case Selection and Sampling

A universal sampling strategy was adopted, and all cases meeting the eligibility criteria during the study period were included. Case identification proceeded in two steps: first, screening of all autopsies performed within the defined time frame; and second, verification of inclusion criteria based on the manner of death and gambling history.

The inclusion criteria required that cases had been reviewed by the Council of Forensic Medicine between September 1, 2015, and September 1, 2025, and that a forensic autopsy had been performed. In addition, the manner of death had to be classified as “suicide” or “suspected suicide” based on a comprehensive evaluation of autopsy findings together with investigation and scene reports, and there had to be at least one documented piece of evidence indicating gambling behavior or gambling-related debt (e.g., witness statements, digital data, financial, or legal records).

The exclusion criteria comprised cases with insufficient data preventing the extraction of key variables (e.g., gambling-related factors, psychiatric comorbidities, suicide method, and toxicological findings), cases in which the manner of death remained “undetermined” due to a lack of sufficient evidence, duplicate records, and cases classified as having a “natural” manner of death.

Data Collection and Variables

Data were systematically extracted from the electronic archive and case files available in the National Judiciary Informatics System of Türkiye (UYAP), which is an official digital platform used by all institutions of the Ministry of Justice. For each case, a comprehensive set of variables was collected. Sociodemographic data included age, sex, marital status, educational attainment, employment status, place of residence (urban or rural), and living arrangement. Economic and family-related factors such as the presence of debt, unemployment, and intrafamilial problems were also recorded. Gambling-related information encompassed gambling history, online gambling status, sources of debt, and any documented evidence of intense gambling behavior immediately prior to death. Clinical variables consisted of previous suicide attempts, psychiatric diagnoses, history of treatment applications, types of medication used, and recent changes in medication, including initiation or dose increase. Finally, forensic and toxicological characteristics were gathered, including the method of suicide, the presence of a suicide note, and postmortem toxicological findings for alcohol and psychoactive substances.

Operational Definitions

“Gambling history” was defined as any documented record or witness statement explicitly reporting gambling or gambling-related debts. “Online gambling” was coded as present only when explicitly documented in the case file or witness statements; vague or suspected accounts were not classified as such. “Intense gambling prior to death” referred to a marked increase in gambling activity immediately before the fatal incident, as explicitly stated in records. Psychiatric diagnoses and medication use were recorded as reported in the files, without additional clinical verification.

Suicide methods and toxicological results were classified based on official forensic reports.

Ethical Considerations

The study was conducted in compliance with national regulations on the use of forensic data. All identifying information was removed prior to analysis. As the research was based exclusively on deceased individuals and retrospective anonymized data, informed consent was not required. Institutional and legal approvals were obtained in accordance with local regulations. This study was approved by the Training and Scientific Research Commission of the Council of Forensic Medicine, Istanbul, Türkiye (Approval Date: 02.09.2025; Approval Number: 21589509/2025/1132). All data were anonymized to protect the privacy and confidentiality of the subjects. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Statistical Analysis

Data were anonymized prior to analysis. A case-available approach was adopted, and denominators for percentages varied according to the number of cases with available data for each variable. No imputation was performed for missing values. Statistical analyses were performed using SPSS (IBM SPSS Corp.; Armonk, NY, USA) software. Given the descriptive nature of the study and the sample size, only descriptive statistics were used: categorical variables were expressed as frequency (*n*) and percentage (%), while continuous variables were reported as mean ± standard deviation. Cases were also stratified according to the presence of online gambling and compared descriptively across sociodemographic, clinical, and forensic variables. No inferential statistical tests were applied.

Results

A total of 24 cases were included in the study, of which 87.5% were male and 12.5% female. The age distribution showed that 33.3% were between 18 and 30 years, 37.5% were between 31 and 45 years, 25.0% were between 46 and 60 years, and 4.2% were ≥61 years. Regarding marital status, half of the individuals (50.0%) were married, 37.5% were single, and 12.5% were divorced. In terms of educational level, 29.2% had a primary school education, 25.0% were high school graduates, and 45.8% had completed university. Employment status revealed that 66.7% were employed, 20.8% unemployed, 8.3% retired, and 4.2% students. The majority of cases (83.3%) lived in urban areas. While 45.8% were living alone, 54.2% resided with family members. Economic difficulties were prominent, with debt reported in 91.7% of cases, whereas unemployment was present in 8.3%. Intrafamilial problems were documented in 54.2% of cases (Table 1).

All cases (100.0%) had a history of gambling. Previous suicide attempts were reported in 29.2% of the cases. Among those with psychiatric diagnoses, bipolar disorder was the most common (66.7%), followed by depression (16.7%) and attention-deficit/hyperactivity disorder (16.7%). One-quarter of the cases (25.0%) had previously sought treatment. Antipsychotics were the most frequently reported medication (66.7%), followed by antidepressants (16.7%) and psychostimulants (16.7%). Only 4.2% had requested treatment specifically for gambling addiction. A suicide note was present in 29.2% of cases, and online gambling was

Table 1.
Sociodemographic Characteristics of the Cases

	<i>n</i>	%
Sex		
Female	3	12.5
Male	21	87.5
Age group (years)		
18 – 30	8	33.3
31 – 45	9	37.5
46 – 60	6	25.0
≥61	1	4.2
Marital status		
Single	9	37.5
Married	12	50.0
Divorced	3	12.5
Education level		
Primary school	7	29.2
High school	6	25.0
University	11	45.8
Employment status		
Unemployed	5	20.8
Employed	16	66.7
Student	1	4.2
Retired	2	8.3
Place of residence		
Rural	4	16.7
Urban	20	83.3
Living arrangement		
Alone	11	45.8
With family	13	54.2
Economic problems		
Debt	22	91.7
Unemployment	2	8.3
Intrafamilial problems		
Yes	13	54.2
No	11	45.8

identified in 33.3%. Regarding the source of debt, bank loans (36.4%) and unknown sources (36.4%) were the most common, followed by debts to family/friends (22.7%) and loan sharks (4.5%). Intense gambling behavior immediately before suicide was reported in 16.7% of cases (Table 2).

Drug intoxication was the most frequent suicide method (37.5%), followed by hanging (25.0%), gas inhalation/asphyxia (12.5%), jumping from height (8.3%), firearm use (8.3%), and other methods such as sharp force injury or drowning (8.3%). Postmortem toxicological analysis revealed that 33.3% of cases were positive for alcohol and 29.2% tested positive for psychoactive substances (Table 3).

Table 2.
Clinical Characteristics of the Cases

	n	%
Gambling history	24	100.0
Previous suicide attempt	7	29.2
Psychiatric diagnosis		
Depression	1	16.7
Bipolar disorder	4	66.7
ADHD	1	16.7
Treatment application	6	25.0
Medication type		
Antidepressant	1	16.7
Antipsychotic	4	66.7
Psychostimulant	1	16.7
Medication changes		
Newly initiated	4	66.7
Dose increased	2	33.3
Addiction treatment request	1	4.2
Suicide note present	7	29.2
Online gambling	8	33.3
Debt source		
Bank loan	8	36.4
Family/friends	5	22.7
Loan shark	1	4.5
Unknown	8	36.4
Intense gambling immediately before suicide	4	16.7

Data are presented as frequencies (n) and column percentages (%).

When comparing the eight cases with online gambling to the 16 without, notable differences emerged. All cases in the online gambling group were male, and 75.0% were between 18 and 30 years of age. Being single was more common in the online gambling

Table 3.
Suicide Methods and Toxicological Findings of the Cases

	n	%
Suicide methods		
Drug intoxication	9	37.5
Hanging	6	25.0
Gas inhalation/asphyxia	3	12.5
Jumping from height	2	8.3
Firearm	2	8.3
Others (sharp force, drowning)	2	8.3
Postmortem toxicological findings		
Alcohol positive	8	33.3
Substance positive	7	29.2

Data are presented as frequencies (n) and column percentages (%).

group (62.5%) compared to the non-online group (25.0%). The annual distribution of cases also demonstrated temporal variation, with a noticeable increase in online gambling-related suicides after 2022 (Figure 1). Educational attainment differed, with a lower rate of primary school education (12.5% vs. 37.5%) among online gamblers. Most online gamblers lived with their families (75.0%), whereas the majority of non-online gamblers lived alone (56.3%). A previous suicide attempt was reported in 12.5% of online gamblers compared to 37.5% in the non-online group. Regarding suicide methods, hanging (50.0%) and sharp force injury (12.5%) were more common among online gamblers, while drug intoxication was predominant in the non-online group (50.0%). Toxicological findings showed that alcohol positivity was lower in the online gambling group (12.5%) compared to the non-online group (43.8%) (Table 4).

Discussion

This study represents one of the first autopsy-based series to examine suicides associated with gambling disorder in a comprehensive and multidimensional manner. The 10-year data

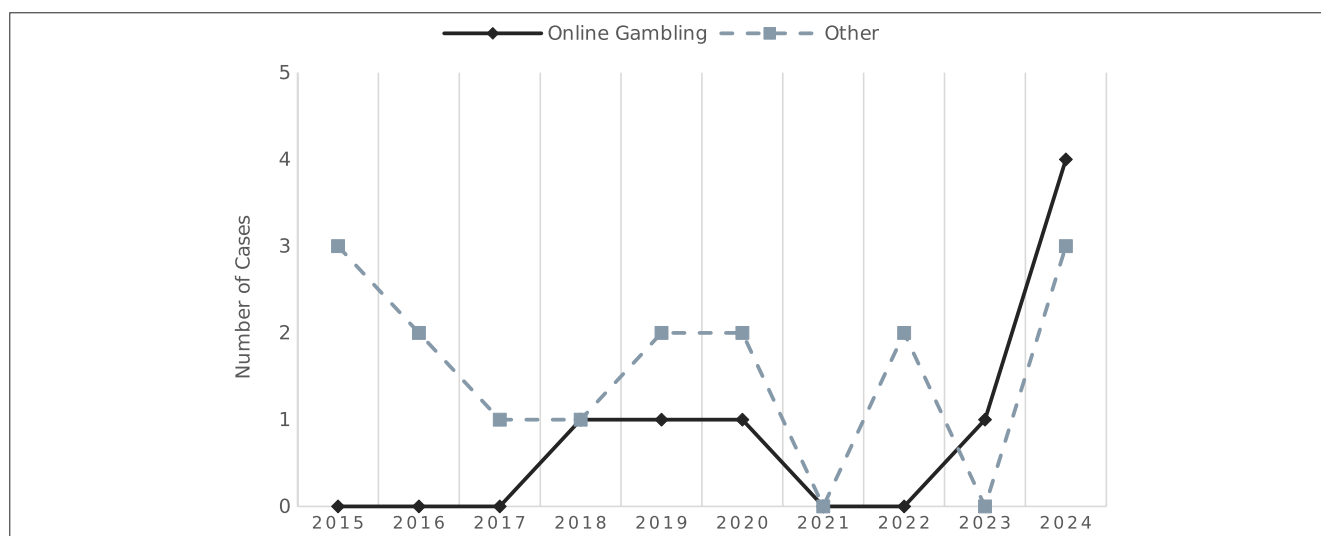


Figure 1. Annual Distribution of Suicide Cases by Gambling Type (2015 – 2024).

Table 4.
Comparison of Case Characteristics by Online Gambling Status

	With Online Gambling (n = 8)	Without Online Gambling (n = 16)
Sex		
Male	8 (100.0%)	13 (81.3%)
Female	0 (0.0%)	3 (18.8%)
Age group (years)		
18 – 30	6 (75.0%)	2 (12.5%)
31 – 45	2 (25.0%)	7 (43.8%)
46 – 60	0 (0.0%)	6 (37.5%)
≥61	0 (0.0%)	1 (6.3%)
Marital status		
Single	5 (62.5%)	4 (25.0%)
Married	3 (37.5%)	9 (56.3%)
Divorced	0 (0.0%)	3 (18.8%)
Education level		
Primary school	1 (12.5%)	6 (37.5%)
High school	4 (50.0%)	2 (12.5%)
University	3 (37.5%)	8 (50.0%)
Place of residence		
Rural	2 (25.0%)	2 (12.5%)
Urban	6 (75.0%)	14 (87.5%)
Living arrangement		
Alone	2 (25.0%)	9 (56.3%)
With family	6 (75.0%)	7 (43.8%)
Previous suicide attempt		
Yes	1 (12.5%)	6 (37.5%)
Suicide method		
Hanging	4 (50.0%)	2 (12.5%)
Firearm	1 (12.5%)	1 (6.3%)
Sharp force injury	1 (12.5%)	0 (0.0%)
Drug intoxication	1 (12.5%)	8 (50.0%)
Gas inhalation/asphyxia	1 (12.5%)	2 (12.5%)
Jumping from height	0 (0.0%)	2 (12.5%)
Drowning	0 (0.0%)	1 (6.3%)
Suicide note	2 (25.0%)	5 (31.3%)
Toxicology		
Alcohol positive	1 (12.5%)	7 (43.8%)
Substance positive	2 (25.0%)	5 (31.3%)

Data are presented as frequencies (n) and column percentages (%).

highlight that gambling disorder constitutes not only an individual but also a societal public health concern capable of leading to fatal outcomes. The predominance of male cases, the overrepresentation of younger individuals, the high prevalence of debt,

the concentration of online gambling among young single men, and the frequent use of drug intoxication and hanging as suicide methods are among the most notable findings. Taken together, these results underscore the need to approach gambling disorder from clinical, forensic, and social perspectives simultaneously.

The overwhelming predominance of male cases in this series is consistent with previous evidence demonstrating higher prevalence rates of both gambling disorder and suicidal behavior among men (Armoon et al., 2023; Husky et al., 2015; Sher, 2022; Ukhova et al., 2024). The finding that the majority of online gambling cases were in the 18 – 30 age group emphasizes the intersection of technological accessibility and impulsive behaviors, suggesting that young adult males represent a particularly vulnerable group for gambling-related suicide risk (Riley et al., 2021). This is in line with studies showing elevated suicidal ideation and attempts in younger cohorts among individuals with gambling problems. For example, in a Swedish nationwide case – control study, nearly 17.7% of individuals with gambling disorder exhibited suicidal behavior compared with 1.6% in matched controls. Psychiatric comorbidity, including anxiety, depression, and substance use disorders, was significantly associated with increased risk (Kidane et al., 2025).

Psychiatric comorbidities were also noteworthy. Bipolar disorder emerged as the most common diagnosis in the present sample, followed by depression and attention-deficit/hyperactivity disorder in smaller proportions (Tamam et al., 2008). This finding highlights the critical role of mood disorders in the pathway linking gambling disorder to suicide. Furthermore, approximately one-third of individuals had a history of prior suicide attempts, reinforcing the importance of systematically assessing past suicidal behavior in clinical risk evaluations of gambling populations (Wardle & McManus, 2021). Such associations between comorbidity and suicide risk have also been reported in other settings: for instance, in the Swedish register - based studies where substance use disorders, depressive disorders, and anxiety disorders increased suicide risk markedly among people with gambling disorder (Karlsson & Håkansson, 2018; Karlsson et al., 2025).

Economic adversity appeared as a nearly universal feature among the cases. Almost all individuals had documented debt, most derived from bank loans or unspecified sources. The presence of intense gambling immediately before death in a subset of cases suggests that sudden escalation in financial and emotional stressors may act as acute precipitants of suicidal behavior (Andreeva et al., 2022). Literature supports this: studies have found that problem gambling correlates strongly with indebtedness, financial hardship, and economic vulnerabilities, which in turn are associated with suicidal ideation and attempts (Karlsson & Håkansson, 2018; Wong et al., 2010).

Analysis of suicide methods revealed drug intoxication as the most common means, followed by hanging. These findings align with previously reported patterns in forensic series. Toxicological analyses demonstrated alcohol and substance positivity in approximately one-third of cases, underlining the contribution of substance use as an additional risk factor in gambling-related suicides. This is corroborated by meta-analytic reviews showing elevated substance use among gambling disorder patients with

suicidal behaviors (Armoon et al., 2023; Marionneau & Nikkinen, 2022).

When comparing cases by online gambling status, several distinct patterns emerged. Individuals who engaged in online gambling were younger, exclusively male, and more likely to live with their families, in contrast to the higher proportion of solitary living among those without online gambling. In this study, suicides associated with online gambling were found to be on an increasing trend over the years. This finding is consistent with the literature and may be related to technological advances and increased accessibility to online gambling (Challet-Bouju et al., 2024; Jones et al., 2025). Method of suicide also differed: hanging was more common among online gamblers, whereas drug intoxication predominated in the non-online group. The preference for more lethal and less reversible methods among online gamblers may suggest a distinct risk profile in this subgroup (Redondo, 2015). Interestingly, alcohol positivity was lower in online gambling cases, further indicating possible differences in underlying behavioral and psychosocial characteristics. Although few studies so far have separated online vs. offline gambling in autopsy or forensic samples, broader literature suggests that online gambling tends to have higher impulsivity, accessibility, and possibly more severe outcomes (Vijayakumar & Vijayakumar, 2023).

An important dimension corroborated by international literature is the strong mediating effect of debt stress in the gambling – suicidality link (Oksanen et al., 2018). A study on over-indebted individuals found that financial debts drove psychological distress and were independently associated with suicidal thoughts and behaviors—even when controlling for gambling disorder (Barone & Graffigna, 2025). Additionally, problem gamblers in population surveys have shown significantly elevated rates of suicidal ideation and attempts, with severity of gambling behavior correlating with higher suicidality (Thon et al., 2014). These findings support the observation that almost all the cases had documented debt, pointing to debt not just as a consequence of gambling but as a potential trigger for acute suicidal crises.

The magnitude of suicide mortality associated with gambling disorder has also been quantified recently: a 2025 study demonstrated that individuals diagnosed with gambling disorder have significantly increased suicide mortality compared with both the general population and other patient groups (Kristensen et al., 2025). Such data provide external validity to the present results, especially concerning method lethality and demographic risk patterns. Moreover, studies of indebtedness among gamblers show that unsecured debt in particular tends to exacerbate gambling-related harm and increase mental health risks (Marionneau & Nikkinen, 2022; Muggleton et al., 2021). This underscores the need for assessment of not only the presence of debt but also its type, magnitude, and the debtor's perceived ability to repay, as potential stratifiers of suicide risk.

Beyond the forensic and clinical dimensions, these findings also carry important implications for primary care and public health practice. Gambling disorder and its associated suicide risks are often overlooked in family medicine, yet they represent issues that may be detectable and preventable if recognized early. Family physicians may identify risk patterns through indirect cues such as debt history, sleep disturbances, depressive symptoms, or

family conflicts, and can provide timely referrals to specialized services. From a public health perspective, community-based awareness campaigns targeting young men, improving accessibility of addiction treatment centers, and regulating online gambling environments could play a critical role in suicide prevention. These considerations reinforce the notion that gambling-related suicides should be addressed not only as an individual problem but also as a societal challenge, requiring integrated policies that combine clinical, forensic, and social interventions.

Limitations

This study should be interpreted considering several limitations. First, the retrospective design inherently restricted data collection to information available in official case files and witness statements. Consequently, important variables such as the exact duration and severity of gambling behavior, the amount and structure of debt, and detailed psychiatric histories could not be comprehensively assessed. Psychiatric diagnoses recorded in the files were based on prior documentation rather than standardized clinical evaluations, and thus their validity may be limited. Similarly, the timing and accuracy of reported treatment histories, medication use, and changes in prescriptions could not be independently verified. Second, the study relied exclusively on forensic autopsy cases evaluated by the XXX, which may not represent all gambling-related suicides in the general population. Deaths classified without autopsy, suicides not referred to forensic investigation, or cases in which gambling history was not documented would not have been captured in this dataset. As such, there is a risk of selection bias, and the findings cannot be generalized to all individuals with gambling disorder. Third, the reliance on witness statements and secondary reports introduces the possibility of reporting bias. Families and acquaintances may underreport or fail to recognize gambling behaviors, psychiatric symptoms, or substance use, leading to potential underestimation of these variables. Likewise, online gambling may be underdetected when explicit documentation was lacking, possibly resulting in misclassification bias. Fourth, the relatively small sample size limits the statistical power of subgroup analyses, particularly when comparing online versus offline gambling groups. The descriptive nature of the study precluded inferential statistical testing, and observed differences should therefore be interpreted with caution. Finally, the study did not account for potentially relevant contextual factors such as cultural attitudes toward gambling, availability of gambling platforms, or broader socioeconomic influences, which may also shape the relationship between gambling disorder and suicide. Future research incorporating prospective designs, larger and more representative samples, and standardized psychiatric assessments would be essential to overcome these limitations and provide more definitive conclusions.

In conclusion, this study provides original autopsy-based evidence on the sociodemographic, clinical, and toxicological features of gambling-related suicides, underscoring the complex interplay of financial debt, psychiatric comorbidity, online gambling behaviors, and social context in shaping fatal outcomes. The predominance of young men, the frequent presence of mood disorders, and the use of highly lethal methods highlight the need for multidisciplinary risk assessment that extends beyond clinical symptoms to include economic and social dimensions. From

both clinical and forensic perspectives, systematic screening for gambling behaviors and debt, improved documentation in suicide investigations, and stronger regulatory frameworks addressing gambling practices are essential. Future prospective and larger-scale studies are warranted to refine risk profiles and inform the development of targeted, effective prevention strategies.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical committee approval was received from the Training and Scientific Research Commission of the Council of Forensic Medicine, Istanbul, Türkiye (Approval No.:21589509/2025/1132; Date: September 2, 2025). All data were anonymized to protect the privacy and confidentiality of the subjects. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Informed Consent: As the research was based exclusively on deceased individuals and retrospective anonymized data, informed consent was not required. Institutional and legal approvals were obtained in accordance with local regulations.

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REVIEW

Pornography and Masturbation Addictions through the Lens of Self-Help: Insights from NeverFap Academy Members

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Main Points

- Participants' exposure to pornography and masturbation addiction typically began during adolescence, influenced by their social environment and easy access to technology.
- These addictions negatively impacted individuals' psychological, academic, social, and familial lives, leading to issues such as guilt, social isolation, lack of focus, and communication problems.
- NeverFap Academy's camps, WhatsApp groups, and digital content provided participants with structured routines, social support, and opportunities for personal growth, significantly aiding their recovery process.

Abstract

This qualitative study analyzes the experiences of individuals struggling with pornography and masturbation addiction, focusing on their engagement with NeverFap Academy, a peer-based self-help platform in Türkiye. Semi-structured interviews were conducted with participants who actively used the NeverFap's resources, including thematic online camps, WhatsApp support groups, YouTube videos, and blog content. Thematic analysis identified three major themes: encountering addiction, effects on life, and fighting addiction. Findings revealed that initial exposure to pornography, often accompanied by compulsive masturbation, typically occurred during adolescence, influenced by peers and easy online access. Participants reported significant negative effects in psychological, academic, social, and familial domains, including guilt, concentration problems, social withdrawal, and strained relationships. NeverFap Academy was seen as instrumental in promoting recovery through structured routines, community support, and value-based motivation. The platform not only helped reduce addictive behaviors but also fostered personal growth and a renewed sense of purpose. While the study shows the value of community-based efforts in addressing addiction, its findings are limited to the NeverFap community. Future research should compare self-help initiatives like NoFap, NeverFap, and Jiese and explore their integration into broader mental health and policy frameworks.

Keywords: Addiction, masturbation, pornography, self-help group

Introduction

Behavioral addictions refer to persistent patterns of behavior that individuals struggle to control, including internet, gaming, gambling, shopping, and sexual behaviors (Yaman et al., 2015; Zubaroğlu Yanardağ et al., 2020). Pornography and masturbation addictions fall under sexual behavioral

addictions. While pornography addiction involves continued use despite value conflicts (Fraumeni-McBride, 2019), masturbation addiction is marked by compulsive sexual stimulation and lack of self-control. Though physical harms of masturbation lack strong empirical support, some studies advocate abstinence (Zimmer & Imhoff, 2020).

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Despite ongoing debate, increasing digital access to sexual content has reignited arguments for classifying these behaviors as addictions (Kızılok, 2021). The DSM-V lacks diagnostic criteria due to insufficient evidence (Weir, 2014). However, the ICD-11 (World Health Organization, 2019) officially recognized compulsive sexual behavior disorder (CSBD). Although it does not explicitly define pornography or masturbation addiction, CSBD provides a diagnostic framework that encompasses compulsive patterns of sexual behavior, including excessive pornography use and masturbation. In this context, Taylor (2019) attributes the addiction framing to media influence and behavioral addiction theories. Based on these perspectives, this study approaches the issue within the addiction framework.

Historically, concerns about masturbation and pornography trace back to Tissot's Onanism (1766), where masturbation was linked to imagination and habit (Garlick, 2011). With technological advancement and widespread internet access, pornography has become more accessible and normalized (McNabney et al., 2020), shifting attention from moral concerns to psychological and social implications (Harper, 2013; Perelman & Rowland, 2008; Magness, 2013). Ullén (2009) sees pornography as a market commodity, with associated masturbation resembling shopping addiction. Lautmann and Schetsche (1990) emphasize the psychological reinforcement of visual stimuli in this process.

These behaviors can impact romantic and sexual relationships. Frequent pornography use may heighten arousal but reduce satisfaction and partnered intimacy (Wright et al., 2021). Similarly, habitual masturbation may diminish emotional closeness (Gottman & Gottman, 2016). More broadly, pornography and masturbation may also have detrimental effects on psychological health (Coleman & Bockting, 2013; Gürel et al., 2025; Sutrisno & Saputra, 2025). Whether these issues should be classified as sexual dysfunctions or behavioral addictions remains debated (Russo et al., 2021; White, 2019; Wood, 2018).

Studies show rising pornography use, with around 75% of men actively engaged (Lewczuk & Gola, 2018; Zattoni et al., 2020). In addressing this, civil society initiatives, especially self-help groups, have gained visibility. One such initiative is NoFap—a peer-support community where members commit to abstinence and support each other (Smith et al., 2022; Taylor & Jackson, 2018). These communities help mitigate triggers like loneliness and boredom (Janssen et al., 2008). The Turkish counterpart of NoFap is NeverFap Academy (NeverFap Akademi, 2023). This study examines NeverFap Academy's role in supporting individuals with pornography and masturbation addictions, based on their lived experiences.

Material and Methods

This study aims to explore the processes of coping with addiction by focusing on the experiences of individuals struggling with pornography and masturbation addiction who have engaged with NeverFap. Designed as a cross-sectional and qualitative inquiry, the research examines participants' addiction-related problems, risk factors, and the perceived functions of NeverFap.

Qualitative research provides in-depth and contextual insights into individuals' lived experiences (Baltacı, 2019). In this study,

a phenomenological design was adopted to explore phenomena that are recognized yet insufficiently understood (Creswell, 2013; Tekindal & Uğuz-Arsu, 2020). Rich data were obtained through participants' personal narratives concerning their addiction histories and their experiences with NeverFap. These data were then reinterpreted and analyzed by the researchers.

Prior to data collection, ethical approval was obtained from the Social and Human Sciences Ethics Committee of Istanbul University-Cerrahpaşa. Participants were informed about the study and selected based on voluntary participation. All interviews were audio-recorded with informed consent.

Study Group

Given the study's focus, participants were required to be individuals who had received support from NeverFap in their efforts to overcome pornography and masturbation addiction. Accordingly, the researchers contacted the organization's administrators, who then provided information to prospective participants. This process aligns with criterion sampling, in which participants are selected based on predetermined characteristics (Creswell, 2020).

An initial list of 14 volunteers was formed through NeverFap. Following preliminary interviews and consent procedures, 11 participants were ultimately included in the study, as three interviews could not be conducted. All interviews were held via phone calls with participants residing in various cities across Türkiye and were recorded with their explicit permission.

Data Collection

Prior to the interviews, the researchers developed a semi-structured interview form. Following ethical approval, the first interview was conducted on January 3, 2023, and the last on January 11, 2023. The interviews lasted between 45 and 100 minutes, with an average duration of approximately 75 minutes.

Data Analysis

The collected data were analyzed using thematic analysis, a flexible method frequently used in qualitative research to identify patterns and themes within extensive datasets (Attride-Stirling, 2001). The aim was to organize the data and interpret its meaning through a framework of themes and subthemes.

Audio recordings of the interviews were transcribed and uploaded to MAXQDA Analytics Pro 2020. Based on a set of predetermined codes, which were derived from preliminary themes identified by the researchers during the interviews, the data were thoroughly reviewed and coded using the software. The coding process was conducted sequentially by two researchers. After the initial coding was completed by the first researcher, the second researcher reviewed the coding and suggested revisions. Themes and subthemes were generated from these codes, and the analysis process was structured accordingly.

Results

This study primarily aims to examine the effectiveness of NeverFap Academy in addressing pornography and masturbation addictions. Additionally, it contextually explores the development and lived impacts of these addictions. The findings are structured under three main themes and corresponding subthemes and are presented in the Table 2.

Table 1.
Participant Information

Participant	Age, years	Sex	Profession/Department	Duration of Addiction (Years)
P1	28	Male	Imam	16
P2	21	Male	Psychology (S)	8
P3	18	Male	Student	3
P4	19	Female	Law (S)	7
P5	18	Female	International Relations (S)	1.5
P6	25	Male	Dentist	8
P7	22	Male	Guidance and Psychological Counselling (S)	6
P8	19	Male	Theology (S)	8
P9	22	Male	Electrical and Electronics Engineering (Ö)	9.5
P10	22	Female	Psychology (S)	12
P11	23	Male	Medicine (S)	9

Note: P = Participant; (S) = Student.

Encountering Addiction

The initial exposure to pornography and masturbation is considered the starting phase of the addiction process. In this context, the subthemes of “Social Environment” and “Technology” emerge as the primary determinants in this phase.

Social Environment

Some participants stated that their social environment and peer relationships played a significant role in their initial exposure to these behaviors. The school setting, in particular, stood out as a triggering context.

“When I was in fourth grade, it was a topic that came up jokingly among our friends. We also had internet access at the time. That’s how I got introduced to the porn industry ... And shortly after, it turned into masturbation behavior. ... I think the main driving factor was not wanting to be excluded by the peer group. Because a child that age doesn’t want to feel left out in conversations among friends.” (P8)

“I was probably in eighth grade, and that kind of talk was always circulating among my friends. It didn’t really interest me much. But then I remember one of my friends coming to me and saying, ‘Look, there’s this thing,’ and showing it to me. I remember feeling really uncomfortable the first time I saw it.” (P11)

Among female participants, however, the process was more often described as individual and self-directed, without external guidance.

“I discovered it completely on my own. At least that’s what I think. Because at first, it didn’t make me feel bad. I felt more like ... it seemed normal.” (P10)

“I don’t know, I mean, my friends didn’t influence me at all. I just discovered it one day, and when I did, I felt like I had invented something—it made me happy.” (P5)

Technology

According to participants, technological tools played a key role in their initial exposure to pornography and masturbation. Communication devices such as phones, computers, televisions, and the internet significantly facilitated access to these behaviors.

“I used to sneak into internet cafés and sit in the back ... Even seeing a photo was enough for me.” (P1)

“A friend said, ‘Come, I’ll show you something.’ I thought it would be a funny video, but it wasn’t. Another friend also showed me something when we were studying at their place.” (P9)

These statements indicate that technological tools were used not only individually but also through peer influence. Friends actively played a role in introducing participants to pornographic content.

“When I was 11 – 12 years old, I was sexually harassed.” “And as a result, it first showed up in the form of watching. I started with YouTube, though it doesn’t allow everything—just limited content. From there, I began shifting toward other websites.” (P4)

“I can say I first encountered it when I got my first phone. I was in the first year of high school, and I had internet access. I hadn’t seen an actual porn site yet, but I had started coming across accessible content online.” (P10)

Table 2.
Themes and Subthemes

Themes	Subthemes
Encountering addiction	Social environment technology
Effects on life	Psychological effects Academic effects Social effects Familial effects
NeverFap in fighting addiction	NeverFap practices Benefits of NeverFap

For some participants, prior traumas or gaining access to technological devices formed the foundation for their initial exposure to these behaviors. Technology not only made content more accessible but also created a pathway for the development of such behaviors.

Impact of Addiction on Life

Pornography and masturbation addiction influence individuals' lives in multifaceted ways. Based on participant accounts, these effects were categorized under four subthemes: psychological, academic, social, and familial.

Psychological Effects

Participants emphasized the profound psychological distress caused by the addiction. Feelings following pornography use or masturbation were described as emotional breakdown, guilt, hopelessness, spiritual conflict, and anger.

"When your belief in making a change weakens, you fall into a pessimistic state ... You might become angrier, doing things you normally wouldn't." (P2)

"After each time I masturbated, I felt an intense discomfort, guilt, or something else. I remember feeling it very strongly." (P11)

"Yes, I constantly feel guilty. It's pleasurable during, but afterwards, I might have a crying episode or feel deep guilt..." (P4)

"You start to become melancholic. You withdraw and reduce your communication with others to a minimum. You react impulsively—either very angry or completely numb." (P8)

Some participants noted a conflict between the addictive behaviors and their personal values, leading to deep internal struggles. Guilt and anger toward the self were often rooted in the contradiction between public persona and private behaviors.

"I used to feel intense anger toward myself. Like, how can you not beat this? I was fixated on that purity you see in children. I valued that a lot. And if I'm someone who values innocence, then why can't I escape this? I thought maybe I was just someone God didn't love." (P6)

"Like, I talk about things like I'm a good person, but I have this addiction. People think highly of me. But when I go home, I become someone else. I do things no one would ever expect. This addiction is disgusting." (P4)

Academic Effects

Pornography and masturbation addiction were reported to negatively impact participants' academic lives. As the onset of addiction often coincided with school years, participants described direct consequences on their academic performance.

"In middle school, I used to rank first in my class and in city-wide prep exams ... But during high school, when my addiction deepened, it was all about playing games, chatting with friends, goofing around, coming home and watching porn. That's how it went." (P9)

Several participants described difficulties with concentration and time management, especially during periods of academic preparation.

"Concentration was my biggest issue. I had the high school entrance exam, LGS, and I couldn't focus at all. My mind was somewhere else while I was trying to study, but it just didn't work." (P5)

"I was really exhausted. It was a constant fall into addiction, and it prevented me from studying. I couldn't understand the topic, couldn't focus, and couldn't solve the questions." (P4)

According to these narratives, the loss of time and attention due to addiction made it difficult to maintain a consistent academic routine, resulting in decreased motivation, a sense of failure, and guilt.

Social Effects

Participant statements indicate that pornography and masturbation addiction significantly affect social life. Difficulties in maintaining daily routines, a decreased desire for social interaction, and a decline in social skills were frequently mentioned. Some participants deliberately chose solitude to make time for these behaviors, which over time became a habitual lifestyle.

"It prevents you from controlling yourself, managing your life, sticking to routines, or pursuing your goals. Even when you don't want it, addiction takes your time and weakens your ability to act. It's simply an obstacle in your way." (P2)

"I really struggled with socializing. I had a shy side and a strong fear of making mistakes. After the pandemic, it got even worse. I realized I was constantly avoiding social settings." (P10)

Several participants mentioned experiencing a lack of self-confidence, particularly in interactions with the opposite sex. Even basic social skills like making eye contact were described as difficult to achieve.

"I admired scenes where a man talks to a woman in a movie while looking into her eyes. That kind of connection ... I was craving it. Back then, it felt completely unreachable for me." (P6)

"I didn't want to meet boys. I didn't want to be friends with them ... In middle school, maybe the way men treated women in porn influenced me..." (P5)

In some cases, violent or aggressive patterns seen in pornographic content were consciously or unconsciously reflected in participants' social behavior. P5's comment suggests that such content may negatively shape perceptions of the opposite sex.

Familial Effects

Pornography and masturbation addiction often develop during a period when individuals still live with their families. This context creates significant implications for familial relationships. Participant narratives reveal that such addiction may lead to involuntary outbursts of anger and weakened communication with family members.

“I could have hurt people when they tried to talk to me. I might have hurt my wife ... Even my family. I even almost hurt my father.” (P1)

“My mom tells my dad that I used to tell her everything that happened at school, but now I don’t say anything. And it’s true. I barely told her anything during high school.” (P7)

Some participants noted that their addiction was used as a form of threat or coercion within the family, particularly when efforts were made to keep it hidden. This secrecy sometimes led to blackmail or psychological pressure.

“My brother discovered it when I was young. If he didn’t get what he wanted, he would threaten me, like ‘I’ll tell mom.’ And I knew my parents wouldn’t react well if they found out.” (P2)

“One guy said, ‘I’m married, but I wasn’t satisfied after sex. I went to the bathroom and started masturbating, and my wife caught me ... That’s how my family fell apart.’ You see what I mean?” (P1)

“My dad is the type to blame others. I always thought he would blame me, so I never shared anything with him.” (P4)

In some cases, addiction was described as a destructive factor within marriage. Sexual dissatisfaction between partners, exacerbated by the addiction, deepened communication problems. The experiences shared by participants illustrate that regardless of one’s role within the family, this type of addiction can have damaging relational consequences.

NeverFap in Fighting Addiction

Since pornography and masturbation addiction negatively affect various aspects of life, addressing this issue is crucial. However, the recovery process often involves several barriers, particularly related to seeking support and sharing personal experiences. This theme examines the role of NeverFap in fighting addiction under two subthemes: *NeverFap Practices* and *Benefits of NeverFap*.

NeverFap Practices

NeverFap Academy’s addiction-fighting dynamics are based on a variety of online applications, including a YouTube channel, blog posts, camps, and WhatsApp groups. Participants emphasized that these structures serve both informational and motivating functions.

Among the services offered, NeverFap’s online camps are structured and demand-driven interventions. These camps are thematically organized based on user needs, such as willpower, time management, and stress regulation.

“For example, there’s a willpower camp, a time management camp, a stress management camp. There’s also the first step camp.” (P2)

“Camps are actually demand-based. For instance, the stress management camp is offered during high-stress times like exam periods. Willpower camps are offered regularly.” (P8)

Participants described the content of these camps as multifaceted, incorporating awareness-building, task assignment,

behavioral monitoring, and developmental support. The process is facilitated through a mentoring system.

“The videos a person should watch in the camps are predetermined, and there are specific assignments. It starts at a basic level that everyone can manage and gradually increases. Each camp group also has a mentor.” (P2)

“The camp is run via WhatsApp. You send a photo when you wake up in the morning, saying what you’ve done that day, how much you studied, and so on. They also assign tasks like reading a certain book. If you don’t complete the tasks, you’re immediately removed from the camp.” (P5)

These camps are conducted through online communication, with mentors overseeing participants’ daily routines, content delivery, and behavior tracking. The process follows strict rules and maintains a disciplined structure.

Among the various interventions offered by NeverFap, WhatsApp groups hold a significant role in the fight against pornography and masturbation addiction. According to participants, there are three main types of group structures: the main group, where general information and support are shared; the crisis support group, used for rapid intervention during critical moments; and the off-topic group, where everyday subjects are discussed.

“We have a main group where we talk about the recovery process and personal development. Anyone with a question can ask it, and a more experienced peer or a mentor responds. There’s also a crisis support group. When someone is in crisis, they message the group, and available peers or mentors provide support. And then we have an off-topic group.” (P3)

These groups help reduce feelings of isolation and strengthen a sense of belonging, thereby increasing motivation for recovery. Participants shared that reading blog posts and personal experiences within the groups made them feel supported.

“People want someone to witness what they’re going through or to feel like they’re part of a team. That’s why we have WhatsApp groups. We regularly share blog posts prepared by NeverFap Academy about pornography.” (P6)

Group membership requires a small fee, intended to ensure that participants are genuinely committed to recovery and to prevent the spread of harmful content. The symbolic fee was reported to be 15 Turkish Lira.

“When the WhatsApp groups first started, they were free. But since people were joining just to troll and even shared porn, a symbolic fee of 15 lira was introduced.” (P9)

According to participant accounts, a separate group was created specifically for female users, as they are underrepresented in the program. This group includes tailored challenge events and mutual support mechanisms.

“There’s a women’s group, for example. Because there are fewer women, they created a special group. They do a challenge, like not watching or doing anything for a whole month.” (P5)

In summary, the WhatsApp groups have become a functional part of the recovery process, serving both as platforms for information exchange and as sources of social support.

As part of its efforts to combat pornography and masturbation addiction, NeverFap provides online educational content via its YouTube channel and blog page. Participants frequently reported that their initial contact with NeverFap occurred through these resources.

“There are really well-prepared videos on the YouTube channel. They cover what to do at the beginning of the addiction, the stages of the addiction, and the traps we might face. The content is structured in sections, both as blog posts and videos.” (P4)

“Many of NeverFap’s YouTube videos and blog posts are based on scientific studies. People need to have a grasp of the scientific background. Otherwise, they don’t develop a strong belief in the process.” (P7)

“We usually share more informative and scientific articles on the blog. On YouTube, if a video goes beyond 8 – 10 minutes, the view count drops. So we post longer content on the blog instead.” (P5)

The scientific basis of both the YouTube and blog contents enhanced participants’ trust in the program. Due to time limitations on video engagement, more comprehensive information is shared through the blog platform.

Benefits of NeverFap

The services provided by NeverFap have led to significant outcomes in both addiction recovery and personal development. Key gains include recognizing the addiction, accessing support, and developing greater awareness of life quality.

“Following their content made my life much better. I was depressed and lost, but then I saw people who had been through similar things and supported it with scientific knowledge. I realized that living well was actually possible.” (P2)

“I started exercising, doing push-ups and pull-ups at home. I also began reading, even if just a little. I could focus better on my exams.” (P1)

“After discovering NeverFap, you start realizing how disgusting and disturbing pornography and masturbation really are... You also change your social circle, because if you talk about this with friends, they look at you like you’re an alien.” (P5)

Joining a new social community, realizing you’re not alone in your struggle, and having a space to share without judgment were reported as meaningful social benefits.

“There are people there who feel the same way I do. I never told anyone about this. But now I gather with a group and talk about it every weekend.” (P10)

Some participants stated that being part of NeverFap helped them find new meaning in life and motivated them to adopt a more active lifestyle.

“When I joined NeverFap Academy, I had completely lost hope. But it helped me realize my potential and strive for it. I used to be socially passive, but now I believe I have a purpose and I will work toward it.” (P9)

“I learned to know myself. It wasn’t just about overcoming addiction. Through the camps, I realized I had leadership skills. I got involved in social responsibility projects and community work.” (P4)

These outcomes not only support recovery but also contribute to the individual’s overall empowerment. Recognizing one’s potential and improving social skills increases personal resilience and well-being.

Discussion

This study explored the experiences of individuals struggling with pornography and masturbation addiction within the context of NeverFap Academy. Based on participants’ narratives, three main themes were identified: “Encountering Addiction,” “Effects on Life,” and “Fighting Addiction.” The findings revealed that technology and the social environment played key roles in the initiation of addictive behaviors, which negatively impacted individuals’ psychological, social, academic, and familial lives. Participants reported benefiting from camps, WhatsApp groups, YouTube, and blog content, gaining improvements in both personal functioning and social engagement.

Consistent with prior research, the study confirms that easy access to pornography—facilitated by digital technologies—often coincides with masturbation, particularly among youth (Attwood et al., 2018; George et al., 2019). The internet and peer influence were cited as primary triggers (Setyawati et al., 2020). Participants described effects such as guilt, social withdrawal, concentration difficulties, and interpersonal problems—findings aligned with existing literature on the psychological and relational consequences of pornography consumption (Butler et al., 2018; Chavan & Khandagale, 2021; Grubbs et al., 2017; Shuler et al., 2021; Mestre-Bach & Potenza, 2023; Ohuakanwa et al., 2012; Qadri et al., 2023; Wilt et al., 2016).

NeverFap Academy emerged as a meaningful support system through its structured interventions and peer-based communication tools. While most literature focuses on online forums like NoFap (Chasioti & Binnie, 2021; Smith et al., 2022; Zou et al., 2023), this study highlights a more organized and multifaceted support model. The broader literature on self-help and peer-support groups suggests that such communities provide normalization, reduced stigma, and strengthened identity (Burke et al., 2019; Ettorre, 2025). In this study, voluntary participation, peer mentorship, and regular challenges helped reduce stigma and foster motivation. NeverFap, by integrating educational content, structured routines, and a supportive community, fosters both recovery and personal growth. Similar to NoFap and Jiese, NeverFap aims to overcome addiction, support healthy sexuality, and enhance well-being (Zou et al., 2023). Most participants believed that without this support, their addiction would have worsened. Overall, the study makes visible the psychosocial dynamics of pornography and masturbation addiction while underlining the empowering role of self-help initiatives.

Limitations and Suggestions for Future Research

There are several limitations of this study that should be taken into consideration. First, the research focused solely on members of the NeverFap Academy in Türkiye, which limits the generalizability of the findings. While generalizability is not a primary concern in qualitative research, the findings centered on the NeverFap model do not provide insight into the effectiveness of other self-help groups.

Second, the participants were university students or graduates with similar sociocultural backgrounds. This weakens the representativeness of individuals from different sociocultural and demographic contexts.

Third, the study relied solely on self-reported data gathered through interviews. While rich in qualitative detail, these accounts may be influenced by memory bias, especially given the sensitive nature of the topic.

Fourth, the phenomenological design offers only a cross-sectional view of participants' experiences, without capturing long-term changes or relapse patterns. This limits the ability to interpret the long-term effectiveness of the NeverFap group.

For future research, several directions are recommended:

- Comparative studies that examine different self-help communities such as NoFap, Jiese, or other culturally specific initiatives would provide a broader understanding of the effectiveness of varying models.
- Combining qualitative data with quantitative measures such as standardized psychological assessments or behavioral tracking could enrich the analysis and provide more robust evidence regarding the impact of self-help groups.
- Longitudinal designs are needed to explore long-term outcomes, including relapse patterns, sustained recovery, and the durability of personal and social changes attributed to participation in these groups to combat pornography and masturbation.

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ORIGINAL ARTICLE

What Do Post-Pandemic Graduate Theses Reveal About Behavioral and Digital Addictions? A Bibliometric Analysis

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Main Points

- The number of addiction-related graduate theses in Türkiye has significantly increased after the pandemic, reflecting a growing academic focus on the issue.
- Digital addictions, particularly social media and gaming, are the most frequently studied topics, likely due to their high prevalence and accessibility.
- Addiction-themed theses span various fields, including psychology, sports, education, medicine, and social services, highlighting the need for cross-disciplinary research.
- While studies on gambling addiction have increased, research on online gambling, betting, and pornography addiction remains scarce, likely due to legal and social factors.
- Research findings should inform social policies that focus on prevention, regulation, and public awareness, particularly for emerging addictions like digital and online gambling.

Abstract

The aim of this study is to examine theses on addiction conducted in Türkiye. For this purpose, graduate theses related to addiction, covering the post-pandemic period from 2021 to 2024 and available in the National Thesis Center, were analyzed. Titles and contents containing the term “addiction” were identified using the keyword “bağımlı*.” A total of 1299 master’s theses, 178 medical specialization theses, and 126 doctoral theses were retrieved. After applying exclusion criteria to 195 theses with restricted access, 1604 studies were included in the evaluation. Using the document analysis method, data such as thesis numbers, authors, publication years, topics, sample age ranges, group sizes, types of addiction, and subcategories of addiction were entered into an Excel document and subsequently analyzed. Some key findings from the study are as follows: In 2018, there were 229 theses on addiction, which increased to 452 in 2019. During the pandemic year of 2020, the number dropped to 274 but rose again to 440 in 2021. In the following years, the number of theses on addiction was recorded as 398 in 2022, 463 in 2023, and 498 in 2024. The study examined substance-related, behavioral/digital, and other types of addictions, while non-psychological or non-psychiatric terms (e.g., addiction to educational materials) were excluded from the analysis. The findings indicate that the number of addiction-related theses increased after the pandemic, with a particularly notable rise in theses focusing on behavioral and digital addictions. This trend suggests that contemporary problem areas are reflected in academic research and investigated in theses required for specialization. The most common disciplines for addiction-related theses were identified as psychology, sports, education and instruction, family medicine, nursing, and psychiatry. Among addiction types, digital addictions were the most frequently studied, followed by substance-related addictions. Many addiction-related theses were at the master’s, doctoral, and medical specialization levels, whereas proficiency in arts theses paid significantly less attention to this topic.

Keywords: Addiction, behavioral addiction, bibliometric analysis, dependency, digital addiction

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Introduction

The etymology of the word “addiction” traces back to the Latin term *addictus*. This term refers to a voluntarily established relationship that, over time, enslaves the individual and leads to its continuous perpetuation (Arslan, 2015). The first characteristic that comes to mind when defining addiction is an individual’s irresistible attraction to a substance or behavior, persisting in it despite recognizing or accepting its harmful consequences and repeatedly engaging in the behavior (American Psychiatric Association, 2013). From another perspective, addiction is a chronic neurobiological disorder influenced by environmental, psychosocial, and genetic factors (Gül, 2023).

In addition to its persistent nature, addiction is characterized by relapses, which complicate its treatment (Ögel et al., 2012). Therefore, multidimensional assessments are recommended to better understand addictions. The biopsychosocial model (Engel, 1977; Griffiths, 2005), a widely accepted framework in health sciences, can be used to conceptualize addiction. According to this model, the biological component of addiction involves physiological and genetic processes. Genetic predispositions, increased impulsive behavior, risky decision-making, heightened sensation-seeking, increased compulsivity, and reward sensitivity are key risk factors in this domain (Çakmak & Tamam, 2018). Indeed, the literature often conceptualizes addiction as a brain disease, highlighting the medical aspects of addiction over other perspectives (Acar & Şaşman Kaylı, 2021). This perspective is particularly significant for substance-related disorders. However, all forms of addiction also have psychological and social causes and sustaining factors. For instance, Bahar (2018) conducted in-depth face-to-face interviews with 24 drug users during police interrogations. The study identified multiple reasons for initiating drug use, including family dynamics, identification with role models, peer influence, social deterioration, recreational use, curiosity, medical excuses, and easy access through social media and the internet. These first-hand findings indicate that addiction can stem from developmental curiosity, social cognitive learning through role modeling, and social factors such as social deterioration (Masiak, 2013).

In the psychopathological classification of addiction, notable changes have occurred over time in the symptoms and diagnostic criteria, particularly regarding withdrawal, tolerance, and compulsive use (Yılmaz, 2019). The Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR; American Psychiatric Association [APA], 2022) categorizes addictions into two main groups: substance-related and addictive disorders, and non-substance-related disorders. Substance-related and addictive disorders include alcohol-related disorders, caffeine-related disorders, cannabis-related disorders, hallucinogen-related disorders, inhalant-related disorders, opioid-related disorders, sedative, hypnotic, or anxiolytic-related disorders, stimulant-related disorders, tobacco-related disorders, and other substance use disorders. Disorders related to chemical substances involve intoxication and withdrawal symptoms, as well as patterns of problematic use.

Non-substance-related disorders include gambling disorder, which is the only formally recognized behavioral addiction in this category. While not an official diagnosis, internet gaming

disorder is listed in the DSM-5-TR under conditions for further study, covering both behavioral and digital addictions (APA, 2022). Due to technological advancements and increased prevalence across developmental stages, internet gaming disorder is now considered a public health concern. It has also been officially included in the 11th revision of the International Classification of Diseases (ICD-11) (Rumpf et al., 2018; Arıcak et al., 2018). The classification of these disorders in major diagnostic manuals facilitates epidemiological research and enables the development of effective treatment approaches (Dinç, 2017).

Within the scope of behavioral addictions, certain behaviors characterized by excessive engagement and loss of control have been the subject of research for a long time, despite not being officially included in the DSM-5-TR due to insufficient empirical evidence. Studies have focused on conditions such as exercise addiction (Berczik et al., 2012), shopping addiction (Yılmaz et al., 2022), food addiction (Liu et al., 2010), and pornography addiction (Bóthe et al., 2018). With the increasing prevalence of digital applications and tools, behavioral addictions have also extended to the online realm. As a result, internet addiction (Demetrovics et al., 2008), online gambling addiction (Arıcak, 2019), and social media addiction (Andreassen et al., 2016) have gained attention as areas of concern and research interest.

Preventing addiction and ensuring effective treatment requires not only protecting individuals from stigmatization and social exclusion but also integrating them into society (Derin & Tapan, 2017). For this, it is crucial to evaluate the cumulative scientific knowledge on addiction within a contemporary framework. Global crises, such as the COVID-19 pandemic, which led to quarantine measures and social restrictions, have significantly influenced current conditions (Bekaroğlu & Yılmaz, 2020). For instance, the restrictive and unpredictable nature of the pandemic created stress and uncertainty, leading individuals to seek coping mechanisms through technology. Studies have shown that problematic internet use increased during the pandemic (Király et al., 2020).

Given that graduate theses are often independent of the file drawer effect, bibliometric analysis of addiction-related theses in Türkiye can provide valuable insights into the current state of addiction research. Without imposing restrictions on specific types of addiction or research areas, this study aims to examine the types, numbers, and focus areas of graduate theses written, successfully defended, and approved in Türkiye after the pandemic. This will allow for an observation of how bibliometric trends in addiction studies have evolved over the years.

This study aims to provide a comprehensive overview of addiction-related research conducted in Türkiye during the post-pandemic period by analyzing graduate theses from 2021 to 2024. The underlying assumption is that the pandemic has influenced not only behavioral patterns but also academic interests and priorities. Therefore, it was hypothesized that digital and behavioral addictions have gained increased attention in the post-pandemic academic environment. By focusing on publicly available graduate theses—which are often less influenced by publication bias—this study contributes to the literature by revealing research trends and gaps in addiction studies. To the authors’ knowledge, this is the first study in Türkiye to examine post-pandemic

graduate theses on addiction through a bibliometric approach, with a particular emphasis on behavioral and digital addictions. It also offers insights into the interdisciplinary nature of addiction research in Türkiye and highlights underexplored areas that may benefit from further empirical investigation.

Material and Methods

This section provides information about the research model, data collection, and analysis methods.

Research Model

This study examines addiction-related theses completed between 2021 and 2024, which are available in the Turkish Council of Higher Education Thesis Center (YÖK-Tez) and have granted access permission. A bibliometric method was employed for this comprehensive literature review, utilizing document analysis as a qualitative research method and incorporating content analysis. In this model, existing documents, cases, and other sources are systematically compiled, reviewed, and analyzed (Sak et al., 2021).

Search Strategy and Sample

The search strategy was conducted using the advanced search feature in the YÖK-Tez database with the keyword “bağımlı*” (addict*) in thesis titles. The Boolean operator (*) was used to capture all variations of the word “bağımlılık” (addiction). The inclusion criteria were: (a) theses completed between 2021 and 2024, (b) availability of open access, and (c) relevance to addiction in a psychological or psychiatric context. Exclusion criteria included: (a) theses with restricted access, (b) non-human subject studies (e.g., on rats or mice), and (c) uses of “addiction” unrelated to psychological or behavioral content (e.g., economic dependency, international relations). After applying these criteria, a total of 1604 graduate theses were included, comprising 1299 master’s theses, 178 medical specialization theses, and 125 doctoral theses. This process followed a purposive sampling approach, where all accessible and relevant theses in the population were reviewed.

Data Collection

The research data were obtained through the examination of documents, and this information was compiled in an Excel file. The compiled Excel document includes the thesis number, year, author names, the English and Turkish titles of the theses, their types and subheadings, their categories, and their distribution across different fields. The compiled Excel document can be accessed from the supplementary files section. The data collection process began in November 2024 and was finalized on January 10, 2025, when the final search and verification of entries were conducted.

Procedure

After identifying the theses using the specified keyword, the authors reviewed each title and abstract to determine relevance based on the inclusion and exclusion criteria. Eligible theses were downloaded and coded into a shared Excel document. The data entry included thesis number, title, discipline, year, type of addiction, and other categorical features. Two authors independently checked the database entries for accuracy. In cases of disagreement regarding the classification of a thesis or its inclusion, a consensus was reached through discussion. This collaborative process ensured the reliability of the data and minimized classification bias.

Data Analysis

The data obtained from the research were subjected to content analysis in accordance with bibliometric evaluation criteria. The authors completed the data collection process after the YÖK-Tez database search and cross-checked their findings. In cases where they had differing opinions on whether a thesis should be included in the study, they engaged in discussions and reached a decision regarding its inclusion in the research.

Ethical Approvals of the Study

Since this study was conducted using a bibliometric database search method, it did not require approval from an ethics committee. Access was granted to theses already published by YÖK-Tez, which were in compliance with ethical permissions. All rules highlighted in the “Regulation on Scientific Research and Publication Ethics of Higher Education Institutions” were strictly followed.

Results

The annual data obtained from the database is as follows: In 2018, there were 229 theses focusing on addiction; in 2019, the number increased to 452, and in 2020, during the pandemic period, 274 theses were focused on addiction topics. The bibliometrically analyzed data in this study show that in 2021, the number of theses on addiction rose again to 440. In 2022, 2023, and 2024, the number of theses was 398, 463, and 498, respectively. Since 2021, the number of theses related to addiction has increased across all types of graduate theses. When examining the annual changes in graduate theses after the pandemic, it is noticeable that the increasing trend did not reflect in 2022 (Table 1).

When analyzing theses by their types, it can be observed that the highest frequency is in master’s theses, followed by specialty theses in medicine and doctoral theses. Theses in dentistry specialization and art proficiency are the types in which the topic of addiction has been studied less frequently. Over the past 4 years, only one thesis from each of these two categories has been published (Table 2).

When an analysis of the areas of expertise for all theses over the 4 years is conducted, it is observed that many fields have produced theses within the framework of addiction. However, the fields with the highest frequency are as follows: psychology, sports, education and teaching, family medicine, nursing, psychiatry, public health, social services, sociology, and nutrition and dietetics (Table 3). Although the frequency is very low, it is also observed that theses on addiction have been produced in various other disciplines (e.g., civil aviation, linguistics, labor economics).

Table 1. *Distribution of the Frequency of Theses Published in YÖK-Tez by Year*

Years	Included Theses	Excluded Theses	Annual Total Number of Theses
2024	459	39	498
2023	405	58	463
2022	354	44	398
2021	386	54	440
Total	1604	195	1799

Table 2.*Distribution of the Frequency of Thesis Types Published in YÖK-Tez by Year*

Type of theses	2024	2023	2022	2021	Total
Master's	365	316	283	335	1299
Ph.D.	41	35	32	18	125
Specialty theses in medicine	53	53	39	33	178
Specialty theses in dentistry	0	0	0	0	0
Proficiency in Art	0	1	0	0	1
Included Theses Total	459	405	354	386	1604
Master's	25	32	30	38	125
Ph.D.	12	20	12	13	57
Specialty theses in medicine	2	6	2	2	12
Specialty theses in dentistry	0	0	0	1	1
Proficiency in art	0	0	0	0	0
Excluded Theses Total	39	58	44	54	195
Total	498	463	398	440	1799

After applying the exclusion criteria, the types of addictions in the obtained data were examined. Due to the large number of these addiction types, a grouping process was carried out by considering the relationships between these types. Accordingly, classification was made under four main categories: behavioral, substance-related, organizational/institutional, and other. The most frequent thesis works were conducted on behavioral, substance-related, other, and organizational/institutional addictions in that order. When focusing on the most frequently recurring addiction types in each main category, it was found that in the behavioral addiction category, social media was the most common; in substance-related addictions, alcohol was the most common; and in other addictions, physical/care/bed addiction was the most prevalent (Table 4).

Discussion

In this study, the bibliometric analysis and examination of graduate theses on the topic of addiction in Türkiye (2021 – 2024) after the pandemic were conducted. The findings reveal that academic interest in addiction has varied over the years, with a noticeable increase in the number of theses addressing addiction following the pandemic. The distribution of theses related to addiction across different disciplines indicates a concentration in areas such as psychology, sports, education and teaching, family medicine, social services, and psychiatry. Additionally, when examining types of addiction, digital addictions, especially social media and digital gaming addictions, stand out as the most frequently studied areas. This is likely due to their high prevalence and the ease of accessing individuals who engage in these behaviors (Gainsbury, 2015). Moreover, while there has been an increase in research on gambling addiction in recent years in Türkiye, it has been found that some types of addiction, such as pornography

Table 3.*Number of Theses Published on Addiction in Different Fields*

Areas	2024	2023	2022	2021
Psychology	167	158	147	203
Sports	130	90	80	70
Education and instruction	78	61	66	52
Family medicine	25	31	21	20
Nursing	31	28	17	20
Psychiatry	23	34	19	19
Public health	14	17	8	14
Social work	21	20	2	10
Sociology	10	10	8	12
Nutrition and dietetics	12	17	13	15
Children health and diseases	7	10	3	7
Biology	0	0	2	1
Industrial engineering	0	0	0	2
Economics	1	0	2	0
Physiology	1	0	1	0
Physiotherapy and rehabilitation	6	2	3	2
Religion	3	8	6	4
Forensic medicine	2	2	3	1
Health administration	5	3	4	1
Political sciences	2	0	1	0
Public relations	6	1	3	1
Public administration	1	0	5	0
Management information systems	3	4	1	0
Business administration	0	0	0	8
Science and technology	5	4	6	5
Communication sciences	0	0	33	13
Linguistics	0	0	1	0
Law	0	1	1	0
General surgery	1	0	0	0
Electrical and electronics engineering	1	0	0	0
Neurology	2	0	3	3
Pharmacy	0	1	0	0
Civil aviation	0	0	1	0
Midwifery	1	0		0
Drug addiction and alcoholism	7	3	8	11
Labor economics	1	0	1	0
Food hygiene	1	0	0	0

(Continued)

Table 3.
Number of Theses Published on Addiction in Different Fields (Continued)

Areas	2024	2023	2022	2021
Cardiology	1	0	0	0
Allergy and immunology	1	0	0	0
Journalism	2	0	6	0
Genetics	1	0	2	1
Aerospace engineering	0	0	0	0
Chemistry	1	3	1	0
Emergency medicine	1	0	0	0
Home economics	1	0	0	0
Health care management	1	0	3	0
Ophthalmology	1	0	0	0
Ergotherapy	1	0	1	0
Bioengineering	0	0	0	1
Pharmaceutical toxicology	0	0	1	1

addiction, are less frequently addressed in academic research (Dinçer, 2022). This situation provides an important opportunity to understand the trends in addiction research and to develop recommendations for underexplored areas.

One of the distinguishing features of this study is its focus on graduate theses—a relatively underutilized data source in bibliometric addiction research. Unlike peer-reviewed journal articles, graduate theses offer a broader view of academic priorities and often capture emerging topics that have yet to be widely published. This feature enables this study to reveal patterns and gaps that might otherwise go unnoticed in indexed literature.

Addiction is a multidimensional phenomenon that emerges as a result of the interaction between biological, psychological, social, and environmental factors, deeply impacting individuals' lives (Ewald et al., 2019; Griffiths, 2005). At the biological level, genetic predisposition (Kendler et al., 2003), changes in brain chemistry, and neurological processes play an important role in the development of addiction (Duncan, 2012; Tartar & Gobin, 2019). From a psychological perspective, factors such as personality traits (Ramirez-Castillo et al., 2019), difficulties in impulse control (Gullo & Potenza, 2014), and anxiety disorders (Lüthi & Lüscher, 2014) are directly related to addiction. On the social level, family structure, social environment, and cultural norms are key factors shaping the onset and persistence of addiction (Burke et al., 2017; Zucker et al., 2018). As a result, addiction must be studied from multiple perspectives across different disciplines in terms of its treatment and prevention.

In line with the suggestion above, the study findings indicate that addiction is addressed by many different academic disciplines. Theses on addiction are most concentrated in fields such as psychology, sports, education, family medicine, nursing, psychiatry, public health, and social services. However, addiction-themed studies are also found in disciplines like sociology, nutrition and

Table 4.
Types of Addictions Covered in Theses and Their Frequencies

	2024	2023	2022	2021
Behavioral addictions	383	321	281	319
Social media	109	89	97	97
Digital/online gaming	81	64	35	58
Internet	53	58	55	61
Digital (unspecified)	19	20	10	11
Smart phone	30	20	22	24
Exercise	24	17	21	18
Technology	23	15	9	14
Gambling	13	9	5	1
Eating/food	14	11	15	20
Screen	7	10	4	3
Work	3	0	1	1
Pornography	0	1	0	1
Relation	8	0	2	5
Brands	0	1	3	1
Interpersonal	7	9	7	3
Unspecified behavioral	1	10	5	10
Television	0	0	2	0
Cryptocurrency	0	0	1	0
Emotional	2	2	0	0
Substance-related addictions	64	101	73	70
Alcohol	14	4	5	7
Tobacco	24	17	11	24
Unspecified substance	17	32	32	28
Alcohol and other substances	10	13	5	7
Sedatives and stimulans	11	4	1	1
Shopping	8	7	2	2
Opiates	3	2	3	0
Nicotine	1	1	0	2
Metamphetamines	1	0	1	0
Depressants	1	0	0	0
Hallucinogens	1	0	0	0
Canabis	0	1	0	0
Morphine	0	0	2	0
Psychostimulants	0	1	0	0
Others	24	9	7	5
Mutual dependency	1	1	0	0
Codependency	1	0	0	0
Physical	10	9	0	3
Reward	0	0	1	0
Automobiles	1	0	0	0
Meat	2	0	0	0
Organizational	0	0	1	0

dietetics, communication sciences, law, forensic medicine, management information systems, and public administration. This broad academic interest highlights that addiction is not only an individual issue but also a multifaceted problem with causes and effects that relate to societal concerns.

The examination of addiction within the field of sports is particularly important for the scientific study of the therapeutic effects of sports, recreation programs, and exercise in the treatment of addictions. One of the most striking findings from the interviews conducted by Ertüzün and colleagues (2016) with 24 individuals undergoing treatment at AMATEM was that recreational programs are considered a key element in motivating individuals during addiction treatment. On the other hand, since exercising can also reach a level that qualifies as an addiction, studies on sports addiction are useful for identifying preventive programs (Berczik et al., 2012; Di Lodovico et al., 2019). During the pandemic, due to socialization occurring through digital games, an increase in the use of e-sports was observed, and e-sport addiction began to be addressed in academic studies (Bányai et al., 2019; Yılmaz & Özkan, 2022).

Although there are studies on gambling addiction, it is noteworthy that there are no thesis works on online gambling and betting addiction. Online gambling and betting differ from traditional gambling at the casino due to their constant accessibility, ease of access, and the uninterrupted betting opportunities provided by the interactive and immersive internet environment, making them much more prevalent (Gainsbury, 2015). The use of credit cards or e-wallets in online gambling and betting, along with the use of digital currency, causes gamblers to spend more time gambling and lose more money because they do not feel they are spending real money (Wood et al., 2007). The study of gambling behavior is believed to be hindered, similar to pornography addiction, due to social desirability and legal concerns (Arıcaç, 2019). When reviewing thesis works, a study on cryptocurrency addiction, which seems related to online gambling, suggests that this type of addiction, which is closely linked to self-harming outcomes like suicide, requires further investigation (Andreeva et al., 2022).

Given the multifaceted nature of addiction, it is natural that thesis studies in Türkiye come from various disciplines. The concentration of theses in fields such as psychology, medicine, social services, sports, and education provides a significant framework for understanding the multifaceted nature of addiction. Additionally, even in areas with fewer studies, such as civil aviation, linguistics, economics, and engineering, the existence of addiction-related research highlights the necessity of approaching this phenomenon from an interdisciplinary perspective.

The bibliometric analysis shows that digital addictions have become even more prominent in thesis studies following the pandemic. Considering that being born into or adapting to the digital world is as influential as defining generations (Prensky, 2001), the impact of these devices, which can be beneficial at times and are highly accessible, on human life can be better understood. One reason for the spread of digital addictions is the low cost of access and the fact that, unlike alcohol, substance, or gambling addictions, they do not require direct financial expenditure (Hawi et al., 2019). Indeed, while there is an age

limit for the legal use of substances like tobacco and alcohol, the absence of age restrictions for digital devices and applications has led to the development of digital addictions in young people and children, thereby making it a subject of research (Lareki et al., 2017).

In this context, adopting an interdisciplinary and holistic approach is essential to develop effective strategies for combating addiction. Structuring academic studies on addiction in Türkiye to encourage interdisciplinary collaborations is crucial from this perspective. Particularly, the increasing number of addiction-focused master's and doctoral programs in recent years in Türkiye must have an academic structure that contributes to a more holistic understanding of addiction and the development of more effective solutions. Moreover, the incentives given for writing theses on addiction (e.g., the Yeşilay thesis scholarship) could enhance interdisciplinary or intersectoral studies in the field of addiction, encouraging the evaluation of biopsychosocial and cultural elements (Griffiths, 2005).

Limitations and Directions for Future Research

This study provides a bibliometric analysis of addiction-related graduate theses in Türkiye from 2021 to 2024, offering valuable insights into research trends. However, several limitations should be acknowledged. First, the study is limited to publicly available graduate theses, which may not capture all addiction-related research conducted in Türkiye, particularly unpublished or industry-funded studies and projects. Second, while the analysis identifies research trends and gaps, it does not assess the quality or methodological rigor of the theses reviewed. Finally, the study primarily focuses on addiction topics rather than treatment efficacy or intervention outcomes, limiting its direct applicability to clinical practice.

Future research should expand beyond graduate theses to include peer-reviewed journal articles, governmental reports, and international comparisons to provide a more comprehensive picture of addiction research trends. Additionally, qualitative analyses of methodological approaches used in addiction studies could help assess research quality and improve future studies. Finally, given the limited attention to certain addictions, such as online gambling and pornography addiction, future studies should prioritize these underexplored areas to inform policy and intervention strategies.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Since this study was conducted using a bibliometric database search method, it did not require approval from an ethics committee. Access was granted to theses already published by YÖK-Tez, which were in compliance with ethical permissions.

Informed Consent: Since this study was conducted using a bibliometric database search method, it did not require informed consent.

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Assessment of culture and environment in the Adolescent Brain and Cognitive Development Study: Rationale, description of measures, and early data. *Developmental Cognitive Neuroscience*, 32, 107 – 120. [\[CrossRef\]](#)

ORIGINAL ARTICLE

Examining the Relationship between Digital Obesity, Digital Addiction, Desire for Self-Control, and Academic Achievement among University Students

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Main Points

- Digital obesity is introduced as a new construct distinct from digital addiction.
- Digital obesity strongly predicts digital addiction among university students.
- Age and grade point average are negatively related to digital addiction.
- Self-control desire reduces digital addiction risk.
- Findings provide insights for prevention and intervention programs.

Abstract

This study aimed to examine the interrelated roles of digital obesity, digital addiction, desire for self-control, and academic achievement among university students. A cross-sectional design was employed with 500 undergraduate students recruited through convenience sampling. Data were collected using the Personal Information Form, Digital Obesity Scale, Digital Addiction Scale, and Desire for Self-Control Scale. Descriptive analyses were followed by Pearson correlation and multiple linear regression analyses. Results revealed a strong positive correlation between digital obesity and digital addiction ($r = 0.81, p < .01$). Moreover, digital obesity was negatively associated with grade point average ($r = -0.33, p < .01$) and with desire for self-control ($r = -0.13, p < .01$). Digital addiction also showed negative correlations with grade point average ($r = -0.33, p < .01$) and desire for self-control ($r = -0.22, p < .01$). The regression model explained 68.4% of the variance in digital addiction ($R^2 = 0.684, F = 178.224, p < .001$), with digital obesity emerging as the strongest predictor ($\beta = 0.765, p < .001$). Daily internet usage had a significant positive effect ($\beta = 0.057, p = .048$), whereas desire for self-control negatively predicted addiction ($\beta = -0.097, p < .001$). The findings underscore digital obesity as a central risk factor fostering addictive behaviors, while self-control motivation operates as a protective mechanism. Importantly, the integration of digital obesity, self-control motivation, and academic performance highlights the broader academic and psychological implications of digital risks. Interventions for university students should therefore focus not only on reducing screen time but also on enhancing digital literacy, strengthening self-control skills, and supporting academic success.

Keywords: Academic performance, digital addiction, digital obesity, self-control, university students

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Introduction

With the growing integration of digital technologies into daily life, individuals increasingly spend time online. While offering clear benefits in access to information, communication, and efficiency, this engagement also brings cognitive, emotional, and behavioral challenges. University students, balancing academic demands and social interactions,

are especially vulnerable. Their heavy reliance on digital tools for study, communication, and leisure heightens the risk of problematic use and negative outcomes. In this context, two emerging concepts, digital obesity and digital addiction, have gained attention for their explanatory value (Blachnio et al., 2023; Firth et al., 2024; Karakose et al., 2022; Özbay et al., 2025a).



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Digital obesity refers to the state of cognitive, emotional, and physical overload that occurs when individuals are exposed to excessive and unbalanced digital content beyond their actual needs (Özbay et al., 2025a). Similar to physical obesity, in which excessive and unregulated caloric intake leads to health problems, digital obesity is associated with the overconsumption of “digital calories.” These can manifest as continuous distraction, mental fatigue, sleep disturbances, reduced attention span, and psychological stress (Leonhard, 2016; Newport, 2019). Importantly, this condition cannot be explained solely by screen time. Instead, factors such as the quality of digital content, media multitasking, information overload, and disruptions in face-to-face social interactions serve as critical contributors (Eppler & Mengis, 2004; Schmitt et al., 2018).

Unlike digital addiction, which is characterized by compulsive and repetitive behaviors, digital obesity emphasizes the cumulative impact of passive exposure to large volumes of digital stimuli. In other words, an individual may not exhibit addictive patterns yet still experience the negative consequences of digital overconsumption (High et al., 2023). This makes digital obesity a broader construct that encompasses both the quantity and the quality of digital engagement.

The literature links digital obesity to several theoretical frameworks, including information overload theory, self-regulation theory, and the Interaction of Person – Affect – Cognition – Execution (I-PACE) model (Brand et al., 2019). These frameworks collectively explain how continuous exposure to digital information can overwhelm individuals’ cognitive capacities, disrupt self-regulation mechanisms, and impair psychological well-being. Studies highlight that digital obesity is strongly associated with outcomes such as reduced life satisfaction, diminished academic performance, and increased psychological distress among university students (Baumeister et al., 2007; Karakose et al., 2022; Mehmood et al., 2021).

Furthermore, digital obesity appears to act as a predisposing factor for digital addiction (Firth et al., 2024; Schmitt et al., 2018; Özbay et al., 2025a). Excessive and unbalanced digital consumption undermines self-regulation, reduces individuals’ ability to control impulses, and thus increases the risk of addictive behaviors (High et al., 2023). By reinforcing such tendencies, digital obesity not only sustains but also escalates digital addiction. Consequently, examining digital obesity alongside digital addiction is not merely a conceptual preference but a methodological requirement for understanding the behavioral risks of the digital age (Brand et al., 2019; Özbay et al., 2025a).

Digital addiction, on the other hand, is a form of behavioral addiction characterized by uncontrolled, impulsive, and repetitive engagement with digital devices, applications, or platforms (Panova & Carbonell, 2018). Unlike digital obesity, digital addiction involves compulsive usage patterns that interfere with daily functioning. Subdimensions of digital addiction include inability to control usage duration, relapse after attempts to quit, disruption of daily life routines, negative effects on mood, and inability to terminate usage (Kesici & Tunç, 2018).

Digital addiction has been documented across multiple domains, including internet use, social media, online gaming, and

smartphone dependency. Research consistently demonstrates that it negatively affects academic achievement, social relationships, and psychological well-being (Çınar Özbay et al., 2024; Li et al., 2015). The prevalence of internet addiction among university students has been reported at 6% – 10% in general samples, but rates exceeding 30% have also been documented (Afrin et al., 2023; Aldhahir et al., 2023; Gautam et al., 2024). Such variation reflects both cultural differences and the increasing normalization of digital dependency among young adults.

Importantly, higher levels of digital addiction are closely linked to weaknesses in self-regulation skills and difficulties in self-control (Andreassen et al., 2017; Błachnio et al., 2023). In this way, digital obesity can be regarded as a predisposing condition, while digital addiction constitutes the behavioral outcome. Together, they form a reciprocal cycle in which excessive digital exposure undermines self-regulation, thereby reinforcing compulsive usage.

Several individual and contextual variables significantly influence the development of digital addiction. These include demographic characteristics (such as age, gender, and academic year), behavioral patterns (including daily internet usage time and type of digital activities), and academic factors (such as grade point average (GPA)). Research shows that excessive daily internet use markedly increases addiction risk. For example, students who spend more than two hours online per day are nearly twice as likely to develop internet addiction compared to those with lower usage (Gautam et al., 2024; Salici, 2020). Academic performance also plays a role, with higher levels of digital addiction predicting lower GPAs (Afrin et al., 2023; Javaeed et al., 2020; Li et al., 2020; Özbay et al., 2025b).

Demographic factors such as age and academic year further shape addiction levels. Some findings suggest that as students progress in higher education, they become more adept at regulating internet use, thereby reducing addiction symptoms compared to earlier academic years (Durmuş et al., 2018). These findings highlight the importance of considering both individual differences (e.g., self-regulation skills, age, achievement) and environmental contexts (e.g., academic demands, internet availability) when analyzing digital addiction.

An especially relevant variable in this context is the desire for self-control, defined as a motivational tendency reflecting dissatisfaction with one’s current self-control capacity and the aspiration to improve it (Şimşir & Koç, 2022). This construct differs from actual self-control ability by emphasizing the individual’s motivational drive to strengthen self-regulation.

Individuals with a strong desire for self-control are more likely to resist short-term temptations, avoid impulsive behaviors, and prioritize long-term goals and values. Consequently, they are less vulnerable to digital distractions and more selective in their content consumption. Empirical studies show that higher desire for self-control is associated with lower levels of digital anxiety and burnout (Avcı & Yıldız Durak, 2025; Uziel & Baumeister, 2017). This protective function underscores the importance of motivational factors in mitigating digital risks.

Although there is a growing body of literature on problematic internet use, online gaming addiction, and social media dependency

(Baumeister et al., 2007; Uziel & Baumeister, 2017), research that holistically examines digital obesity, digital addiction, and desire for self-control together is extremely limited. Given that digital obesity is a relatively new concept, its interaction with psychological constructs such as self-control and academic performance remains underexplored. To the best of knowledge, no study has investigated the interplay of these variables specifically among university students. This represents a significant gap in the literature and highlights the need for comprehensive research.

The present study aims to address this gap by examining the relationships among digital obesity, digital addiction, and desire for self-control in university students, while also incorporating demographic and behavioral factors such as age, academic year, GPA, and daily internet use. By doing so, the study seeks to contribute to a deeper understanding of the self-regulation mechanisms underlying digital risks and to inform the design of intervention strategies that promote healthier digital habits.

Hypotheses

- H1. Digital obesity will positively predict digital addiction among university students.
- H2. Desire for self-control will negatively predict digital addiction among university students.
- H3. Academic achievement (GPA) will negatively predict digital addiction among university students.
- H4. Daily internet usage time will positively predict digital addiction among university students.
- H5. Sociodemographic characteristics (age, grade level, and gender) will be associated with digital addiction among university students.
- H6. Digital obesity will be negatively associated with desire for self-control among university students.

Material and Methods

Study Design

This study is a cross-sectional, descriptive, and correlational research conducted to examine the relationship among digital

obesity, digital addiction, and desire for self-control in university students. The study was designed in accordance with the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) reporting guidelines (Von Elm et al., 2014) (Figure 1).

Study Setting and Participants

The study was conducted in June 2025 at a large public university in Türkiye. The study population consisted of 4646 undergraduate students, and the sample size was calculated using the formula for known populations. A power analysis indicated that, with a 95% CI and a 5% margin of error, at least 355 students were required to detect significant differences. However, due to a high response rate during data collection, a total of 500 students were included in the study. Inclusion criteria required participants to be enrolled in an undergraduate program at a university in Türkiye, be 18 years or older, have access to digital devices such as a computer, smartphone, or tablet, and voluntarily complete the online data collection form. Participants who submitted incomplete forms were excluded from the study. This approach ensured that the sample reached a sufficient size while also obtaining reliable data within the framework of voluntary participation.

Data Collection Tools

Sociodemographic Information Form

Developed by the researchers, this form included questions regarding participants' age, gender, level of education, GPA, and daily internet usage time.

Digital Obesity Scale

Developed by Özbay et al. (2025), the Digital Obesity Scale (DOS) was designed to assess individuals' behaviors and tendencies regarding digital content use (Özbay et al., 2025a). The scale consists of 27 items evaluated on a five-point Likert-type scale (1 = Strongly Disagree, 5 = Strongly Agree). It comprises four sub-dimensions: health problems, personal use and behavioral habits, digital content consumption, and social interactions. In the original development study, the internal consistency coefficient was reported as 0.91. In the present study, the Cronbach's alpha reliability coefficient was 0.96, indicating very high internal consistency. The total score ranges from 27 to 135, with subdimension scores calculated similarly. Higher scores reflect increased

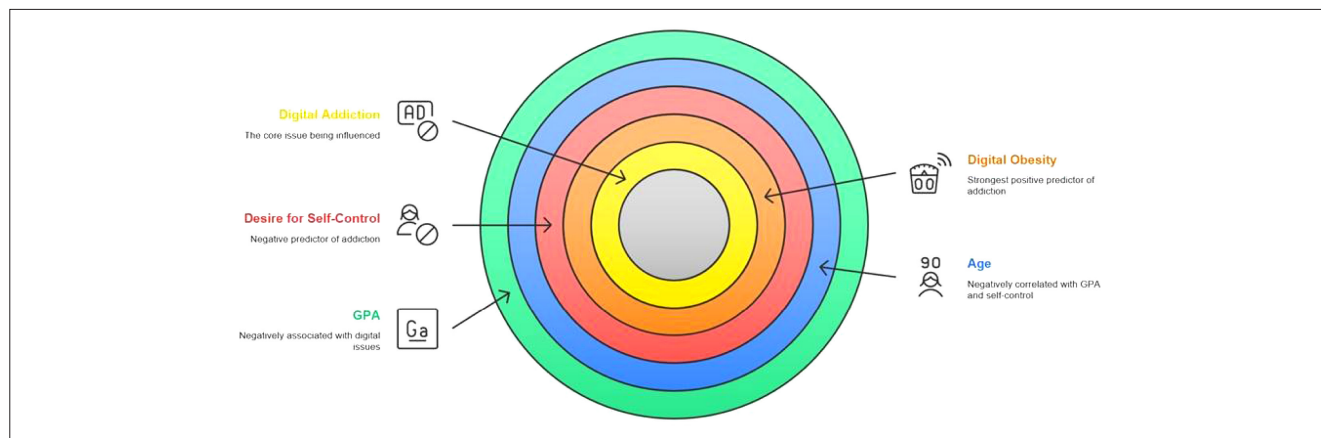


Figure 1. Framework Models of the Study.

levels of digital obesity among university students and more pronounced negative consequences associated with digital content use.

Digital Addiction Scale

Developed for university students by Kesici and Tunç (2018), the Digital Addiction Scale (DAS) assesses individuals' tendencies toward digital technology addiction (Kesici & Tunç, 2018). The scale consists of 19 items grouped under five subdimensions: excessive use, relapse, life flow disruption, mood modification, and inability to stop. The internal consistency coefficient of the original study was reported as 0.87, while in the present study, Cronbach's alpha was found to be 0.98. The scale uses a five-point Likert-type system, with response options ranging from "Strongly Disagree = 1" to "Strongly Agree = 5." Total scores range from 19 to 95, where higher scores indicate higher levels of digital addiction, while lower scores indicate more limited tendencies toward addiction. Thus, the scale provides a comprehensive evaluation of both individual digital usage behaviors and their reflections on different aspects of life.

Desire for Self-Control Scale

This scale was developed by Uziel and Baumeister (2017) to evaluate individuals' desire for greater control over present and future situations and their tendencies toward self-regulation in daily life, with its Turkish adaptation conducted by Şimşir and Koç (2022) (Uziel & Baumeister, 2017; Şimşir & Koç, 2022). The instrument is unidimensional and consists of eight items rated on a five-point Likert-type scale, ranging from "Strongly Disagree" to "Strongly Agree." Higher scores indicate a stronger motivational tendency to improve one's self-control capacity and to pursue greater self-regulation in daily behaviors. In the original development study, internal consistency was reported as 0.87. In the present study, Cronbach's alpha was 0.92, confirming that the Turkish form of the scale is a highly reliable instrument.

Data Collection Process

The study data were collected from undergraduate students enrolled in various faculties and departments at a public university in Türkiye using an online survey method. The data collection tool was prepared via the Google Forms platform and distributed to participants through institutional email addresses and academic-purpose WhatsApp groups. Students who accessed the survey link were first presented with an Informed Consent Form, where they indicated voluntary participation by selecting either "I agree to participate" or "I do not agree to participate."

Participation in the study was entirely voluntary. Informed consent was obtained from all participants, confidentiality and anonymity principles were strictly maintained, and students were explicitly informed that they could withdraw from the study at any stage without penalty. The data collection process was carried out in June 2025.

To ensure data quality and validity, several control measures were applied. The Google Forms survey was set to allow only one submission per participant through IP restriction and single-response settings. Additionally, participants were required to provide their institutional email address to prevent duplicate entries. Incomplete submissions were automatically excluded

from the dataset. These measures minimized the risk of multiple responses and strengthened the reliability of the collected data.

Data Analysis

All statistical analyses were conducted using IBM SPSS Statistics version 26 (IBM SPSS Corp.; Armonk, NY, USA). Descriptive statistics (mean, standard deviation, frequency, and percentage) were used to describe the sociodemographic and behavioral characteristics of the participants (age, gender, grade level, GPA, and daily internet usage time). The assumption of normality was assessed by examining skewness and kurtosis values, which were within the acceptable range of ± 1.5 . Pearson correlation coefficients were calculated to examine the relationships among the study variables, including age, GPA, daily internet usage time, digital obesity, desire for self-control, and digital addiction. In addition, multiple linear regression analysis was conducted to investigate the predictive effects of participant characteristics, technology use, and psychosocial variables on digital addiction. The final model included age, grade level, GPA, daily internet usage time, digital obesity, and desire for self-control as predictors.

Prior to regression analysis, the assumptions of multiple regression were tested: multicollinearity was examined using variance inflation factors ($VIF < 5$), linearity and homoscedasticity were checked through residual and scatter plots, and independence of errors was confirmed with the Durbin – Watson statistic (values near 2). These results indicated that the assumptions of regression analysis were met. In addition, gender was examined as a potential confounding variable. Since gender did not show a significant predictive effect on digital addiction, it was not included in the final regression model. A significance level of $p \leq .05$ was adopted for all statistical tests.

Ethical Considerations

Ethical approval for this study was obtained from the Scientific Research and Publication Ethics Committee of Artvin Çoruh University (Approval no: E-18457941-050.99-181917). The research process adhered to the ethical principles outlined in the Declaration of Helsinki.

Participants were fully informed about the purpose, scope, and procedures of the study. It was clearly emphasized that participation was entirely voluntary, that they could withdraw at any time without any consequences, and that confidentiality and anonymity would be rigorously protected. Informed consent was obtained electronically, as participants provided approval via the online survey form.

Results

The mean age of the participating students was 21.33 ± 1.47 years. Their average academic GPA was 2.75 ± 0.38 , and the mean daily internet usage time was 5.89 ± 1.88 hours. Male students accounted for 52.4% of the participants. Regarding class level distribution, 20.4% of the students were in the first year, 30.4% in the second year, 27.8% in the third year, and 21.4% in the fourth year (Table 1).

According to the Pearson correlation analysis results presented in Table 2, significant relationships were found among the variables. Age was negatively correlated with GPA ($r = -0.12, p < .01$)

Table 1.
Demographic Variables of the Participating Students (n = 500)

Variable	n	%
Gender		
Female	238	47.60
Male	262	52.40
Grade		
Grade 1	102	20.40
Grade 2	152	30.40
Grade 3	139	27.80
Grade 4	107	21.40
	Mean ± SD	
Age	21.33 ± 1.47	
Academic GPA (4.0 scale)	2.75 ± 0.38	
Daily internet usage time	5.89 ± 1.88	

and Desire for Self-Control ($r = -0.15, p < .01$), while positively correlated with Digital Obesity ($r = 0.19, p < .01$) and Digital Addiction ($r = 0.19, p < .01$). The GPA was negatively associated with Digital Obesity ($r = -0.33, p < .01$) and Digital Addiction ($r = -0.33, p < .01$), but positively associated with Desire for Self-Control ($r = 0.15, p < .01$).

In addition, a strong positive correlation was observed between Digital Obesity and Digital Addiction ($r = 0.81, p < .01$). Moreover, Digital Obesity was negatively correlated with Desire for Self-Control ($r = -0.13, p < .01$). Desire for Self-Control was also negatively associated with Digital Addiction ($r = -0.22, p < .01$), indicating that higher levels of self-control are linked to lower tendencies toward digital addiction.

The effects of participant characteristics, technology use, and psychosocial variables on digital addiction were examined using

Table 2.
Pearson Correlation Coefficients among Study Variables (n = 500)

Variable	1	2	3	4	5
1. Age	–	–	–	–	–
2. GPA	–0.12**	–	–	–	–
3. Digital obesity	0.19**	–0.33**	–	–	–
4. Desire for self-control	–0.15**	0.15**	–0.13**	–	–
5. Digital addiction	0.19**	–0.33**	0.81**	–0.22**	–

**indicates $p < .01$.

multiple linear regression analysis, and the results are presented in Table 3. The model included age, grade level, GPA, daily internet usage time, digital obesity, and desire for self-control. The model was found to be statistically significant and explained 68.4% of the variance in digital addiction scores ($R^2 = 0.684; F = 178.224; p < .001$). The findings indicated that digital obesity was the strongest positive predictor ($t = 26.729; p < .001$). Daily internet usage time also showed a positive and statistically significant association ($t = 1.985; p = .048$). In contrast, desire for self-control was negatively and significantly associated with digital addiction ($t = -3.594; p < .001$). The effects of age, grade level, and GPA were not found to be statistically significant.

Discussion

This study provides a comprehensive examination of the relationships between digital obesity, digital addiction, desire for self-control, and academic achievement among university students. With the accelerating pace of digitalization, concerns over students' well-being and performance in higher education are increasingly shaped by their interactions with technology. By

Table 3.
Multiple Linear Regression Predicting Digital Addiction

Predictor Variable	Coefficients ^a						
	Unstandardized Coefficients		Standardized Coefficients	t	p	95% CI	
	B	SE	Beta			Lower Level	Upper Level
Constant	–10.569	13.026		–.811	.418	–36.162	15.023
Age	.424	.560	.027	.758	.449	–.675	1.524
Grade level	–.159	.982	–.006	–.162	.871	–2.089	1.770
GPA	–2.036	1.619	–.034	–1.258	.209	–5.218	1.145
Daily internet usage time	.704	.355	.057	1.985	.048	.007	1.402
Digital obesity	.776	.029	.765	26.729	.000	.719	.833
Desire for self-control	–.390	.109	–.097	–3.594	.000	–.604	–.177
F (p)	178.224 (<0.001) 0.684 0.681						
R ²							
adjR ²							

R², 0.684; p < .001; aDependent variable: Digital Addiction Scale (Total).

integrating these constructs into a single empirical framework, this research offers valuable insights into the interplay of risk and protective factors in the digital age.

The findings demonstrate that digital obesity is a decisive risk factor fostering addiction, that daily internet usage increases vulnerability, and that desire for self-control functions as a protective motivational resource. Academic achievement, while included as a demographic and contextual factor rather than a primary construct, nevertheless exhibited significant associations with both risk and protective variables. Together, these results strengthen theoretical understanding and offer practical guidance for designing interventions to support digital well-being and academic success among students.

Interrelations between Digital Obesity and Digital Addiction

One of the most important findings of this study is the strong positive relationship between digital obesity and digital addiction. Digital obesity refers to a state of cognitive, emotional, and behavioral overload resulting from uncontrolled consumption of digital content (Özbay et al., 2025a). Unlike digital addiction, which emphasizes compulsive use, digital obesity highlights the cumulative burden of continuous, often passive exposure to excessive digital stimuli (High et al., 2023).

The results confirmed that students with higher digital obesity scores were significantly more likely to report digital addiction symptoms. This supports previous research demonstrating that excessive and unbalanced digital consumption undermines self-regulation mechanisms, impairs attentional control, and fosters dependency (Firth et al., 2024; Schmitt et al., 2018). Furthermore, regression analysis indicated that digital obesity was the strongest predictor of addiction, explaining a substantial portion of variance. This finding underscores the need to conceptualize digital obesity not merely as an antecedent but as a central mechanism that intensifies and sustains addictive behaviors.

In addition, the distinction between digital obesity and digital addiction has important preventive implications. Because digital obesity may represent a stage of excessive use before the onset of compulsive addictive behaviors, it offers a critical window for early intervention. Addressing digital obesity through awareness programs, digital literacy initiatives, and self-regulation training may help reduce the likelihood of progression to full-scale addiction.

The implications are both theoretical and practical. Theoretically, these findings lend empirical support to the I-PACE model (Brand et al., 2019), which posits that addictive behaviors emerge from interactions between individual predispositions and environmental exposures. Practically, they suggest that interventions targeting addiction must also address broader patterns of excessive digital engagement, including passive consumption and information overload.

The Protective Role of Desire for Self-Control in Digital Addiction

Another central finding of this study is the negative relationship between desire for self-control and digital addiction. Desire for self-control is defined as a motivational drive reflecting individuals' dissatisfaction with their current level of self-control and their aspiration to improve it (Şimşir & Koç, 2022). Students with

stronger motivation to enhance their self-regulation were less likely to display addictive tendencies.

This aligns with prior studies demonstrating that individuals with higher self-control capacity are better able to resist digital distractions and experience lower levels of digital burnout and anxiety (Avcı & Yıldız Durak, 2025; Hofmann et al., 2012). Importantly, the results indicate that desire for self-control not only mitigates addictive behaviors but also correlates positively with academic performance. Thus, it appears to function as a dual protective factor: reducing vulnerability to digital risks while simultaneously enhancing academic achievement.

These findings have important implications for interventions. While much attention has been devoted to reducing screen time or limiting online access, our results suggest that strengthening students' motivational resources for self-control may be equally, if not more, effective. Programs that enhance self-regulatory motivation through training in goal setting, mindfulness, or cognitive-behavioral strategies may provide sustainable protection against digital addiction.

Age-Related Developmental Trajectories of Digital Behaviors

The correlation analysis revealed that as age increased, students' digital obesity and addiction scores also rose, while GPA and desire for self-control declined. This suggests that prolonged digital exposure during emerging adulthood may elevate risks over time. Previous studies have similarly shown that older university students tend to spend more time on digital platforms, reinforcing addictive behaviors (Gautam et al., 2024; Kuss & Griffiths, 2017; Salici, 2020).

However, regression analyses indicated that the direct effect of age on addiction was not statistically significant. Instead, age appears to influence addiction indirectly through its associations with digital obesity and declining self-control motivation. This nuanced finding highlights that age should not be seen merely as a chronological factor but rather as a developmental indicator of how students' digital habits evolve.

Some studies report contrasting results, suggesting that as students progress through higher education, they may adopt more conscious usage patterns, leading to reduced addiction (Durmuş et al., 2018; Han et al., 2025). Such inconsistencies may be explained by contextual factors, including academic pressures, field of study, and coping strategies. The decline in desire for self-control with age observed in this study is particularly concerning, as it suggests that protective mechanisms weaken over time, leaving students more vulnerable to digital risks.

The Contextual Role of Academic Achievement

A key issue raised by the reviewers concerned the positioning of academic achievement (GPA) within the manuscript. In the introduction, GPA was described as one of several contextual factors influencing digital behaviors (along with age, academic year, and daily internet use). In the discussion, however, GPA was initially framed alongside digital obesity, digital addiction, and self-control as a central construct.

To ensure consistency, it is important to clarify that academic achievement was not a primary variable of interest but rather a

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contextual and demographic factor. Nevertheless, the observed associations were significant and theoretically meaningful. The GPA was negatively correlated with both digital obesity and digital addiction, suggesting that excessive and uncontrolled digital consumption impairs academic performance. This finding echoes previous studies linking internet addiction to lower GPA among students (Afrin et al., 2023; Javaeed et al., 2020).

At the same time, GPA was positively correlated with desire for self-control, indicating that higher-achieving students demonstrate stronger motivation to improve self-regulation. This suggests that self-control motivation may be both a contributor to and a consequence of academic success, reinforcing a virtuous cycle. Thus, while GPA served as a secondary variable, its associations illuminate important pathways linking digital behaviors and academic outcomes.

Daily Internet Usage as a Predictor of Digital Addiction

Daily internet usage emerged as a significant positive predictor of addiction. Students who spent more time online were more likely to report addictive symptoms, consistent with findings that prolonged screen time undermines control over online activities (Kuss & Griffiths, 2017) and exacerbates mental health problems (Twenge & Campbell, 2018). Importantly, while duration alone cannot explain addiction, when combined with digital obesity it substantially magnifies risks.

This result emphasizes that interventions should not only aim to reduce screen time but also address the quality of digital engagement. Excessive passive consumption, scrolling, multitasking, or exposure to irrelevant content may be more harmful than focused academic use.

Limitations and Directions/Suggestions for Future Research

This study has several limitations that should be acknowledged. First, the cross-sectional design restricts the ability to infer causality; the findings reflect correlational associations rather than causal relationships. Longitudinal and experimental studies would be more suitable for identifying the temporal and dynamic interactions between digital obesity and digital addiction.

Second, the sample consisted exclusively of university students, which limits the generalizability of the findings to broader age groups and different occupational or cultural contexts. Future research should therefore include more heterogeneous samples across diverse sociodemographic backgrounds to enhance cross-cultural and intergenerational validity. Third, the reliance on self-report instruments raises the risk of biases such as social desirability, recall errors, and inaccurate self-assessment. To mitigate this, future studies are encouraged to integrate objective measures such as digital usage tracking, behavioral observations, or mixed-methods approaches. Fourth, this study addressed digital addiction in a general manner, without differentiating between specific subtypes such as internet use, social media, online gaming, or smartphone usage. This lack of distinction may limit the specificity and applicability of the findings. Future studies should examine subtypes of digital addiction separately to provide more nuanced insights and targeted recommendations.

In terms of practical implications, interventions targeting digital obesity and digital addiction in young adults should be

prioritized. Psychoeducational programs, digital literacy training, and structured awareness campaigns aimed at strengthening self-regulation and self-control capacities could provide protective benefits. Institutional strategies within universities such as implementing digital detox programs, integrating time management and stress management workshops, and offering counseling or guidance services are recommended to promote digital well-being (Akdeniz Kudubeş et al., 2025). In addition, future research should explore the role of potential mediators and moderators (e.g., psychological resilience, coping strategies, social support, and academic stress) to better explain the mechanisms underlying the link between digital obesity and digital addiction. Such efforts would not only deepen theoretical understanding but also contribute to designing evidence-based prevention and intervention models.

Strengths of the Study

This study has several noteworthy strengths. First, the relatively large sample size ($n = 500$) enhances the statistical power and reliability of the findings. Second, the use of validated and reliable instruments, including the DOS, DAS, and Desire for Self-Control Scale, provides strong measurement validity. Third, the regression model explained a high proportion of variance in digital addiction (68.4%), indicating robust explanatory power. Finally, the theoretical contribution of the study lies in integrating digital obesity, digital addiction, desire for self-control, and academic achievement into a single empirical framework, offering novel insights into the behavioral risks of the digital age.

This study examined the relationships between digital obesity, digital addiction, desire for self-control, and academic achievement among university students. Findings demonstrated that digital obesity was the strongest predictor of digital addiction, daily internet usage increased addiction risk, and desire for self-control acted as a protective factor. Additionally, it was found that as age increased, students reported higher levels of digital obesity and digital addiction but lower levels of academic achievement and desire for self-control. These results underscore that digital addiction should be addressed not only in terms of screen time but also through cognitive and psychological factors.

This study has several strengths, including a relatively large sample size, the use of validated and reliable instruments, and the novel integration of digital obesity into the addiction literature, offering new theoretical contributions. However, certain limitations should be noted, such as the cross-sectional design, reliance on self-report measures, and the focus on university students, which restricts generalizability.

Overall, the findings suggest that intervention and prevention programs for university students should not only aim to reduce screen time but also focus on lowering digital obesity and enhancing self-control skills. Such approaches could contribute to safeguarding both academic success and psychological well-being. In addition, future studies should employ longitudinal and cross-cultural designs, include more diverse populations, and examine potential mediators and moderators to provide a more comprehensive understanding of the mechanisms linking digital obesity and digital addiction.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Artvin Çoruh University (Approval no: E-18457941-050.99-181917; Date: 11 June 2025).

Informed Consent: Informed consent was obtained from the participants who agreed to take part in the study.

Peer-review: Externally peer-reviewed.

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ORIGINAL ARTICLE

The Relations between Eating Behaviors, Body Appreciation, Problematic Internet Use, and Impulsivity: A Research on Testing Different Structural Models*

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Main Points

- In the hypothetical models, problematic internet use and body appreciation were tested as mediators between impulsivity and eating behaviors across five groups (general, female, male, high body mass index, and normal body mass index).
- The model fit was better in the female and normal body mass index groups compared to the male and high body mass index groups.
- In the alternative model, impulsivity mediated the relationship between body appreciation, problematic internet use, and eating behaviors in the general sample.
- The alternative model represented the general sample better than the hypothetical model.
- Impulsivity was a key variable, acting both as an independent and a mediating variable, highlighting its risk potential.

Abstract

This study aims to examine the relationships between eating behaviors, body appreciation, problematic internet use, and impulsivity. The study included 828 university students, 583 females (70.4%) and 245 males (29.6%), aged between 18 and 35, with a mean age of 21.08 years (standard deviation = 3.51). Personal Information Form, Three-Factor Eating Behavior Scale, Body Appreciation Scale, Young Internet Addiction Scale Short Form, and Barratt Impulsivity Scale Short Form were used to collect data. Hypothetical and alternative models were developed for structural equation modeling analysis. For the hypothetical model, five models were created: general sample, female sample, male sample, sample group with high body mass index, and sample group with normal body mass index, and it was examined whether problematic internet use and body appreciation mediated the relationship between impulsivity and eating behaviors, and the sample group representing this mediation best was determined by comparing the models between the groups. In the alternative model, it was investigated whether impulsivity mediated the relationship between body appreciation and problematic internet use and eating behaviors in the general sample group, and finally, the model representing the general sample group best was determined by comparing the general sample group in the hypothetical model with the general sample group in the alternative model.

Keywords: Body appreciation, eating behaviors, impulsivity, problematic internet use, structural equation modeling

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Introduction

Due to changes in life, many people experience eating problems and struggle with obesity or eating disorders, which can lead them to develop negative health conditions. It is known that it is difficult to fully recover from impaired eating behavior (EB), causing various health problems, and that the disorder recurs at high rates (Eltan et al., 2021).

Problems in EBs negatively affect body mass index (BMI). In a similar study, BMI showed a significant positive relationship with cognitive restrictive eating and eating disorders symptoms (Mohorić et al., 2022). Being overweight in late adolescence and early adulthood may increase the risk of bulimia neurosis symptoms. Individuals at this risk are constantly preoccupied with their body shape and weight and are affected by the fear of gaining weight. They also restrict their calorie intake and completely avoid certain food groups (Mohajan & Mohajan, 2023).

Young adulthood is a developmental stage often characterized by concerns about weight and appearance, as well as changes in eating habits. Young adulthood is considered a risky period for developing eating disorders (Azzeh et al., 2022). A recent longitudinal study showed that preoccupation with body weight, body dissatisfaction, and bulimic behaviors increased from 11 seconds to 25 seconds (Slane et al., 2014).

There has been a recent increase in studies on EBs (Baudinet et al., 2020). The prevalence of eating disorders has been gradually increasing in both men and women over the years (Alici, 2021). In different studies conducted on university students, the prevalence of eating disorder risk was 40.5% among female students and 21.7% among male students (Tayhan, 2023).

The effect of problematic internet use (PIU) on eating disorders has been known for years. Various social networks on the internet are also increasingly used as an information source on beauty and ideal body forms. On these platforms, users tend to compare their own physical features with unrealistic and unattainable body ideals. On the internet, photos, videos, and advertisements aiming to inspire individuals to stay physically fit through strict exercise and diet, especially for achieving an ideal and attractive body, may cause individuals to develop restrictive EBs and excessive weight loss (Giorgetti et al., 2020). In a sample of 18- to 25-year-old women, researchers found that body shame and body image avoidance mediated the effect of weekly internet use on bulimic symptoms (Melioli et al., 2015). A positive significant relationship was observed between discussing body-related topics on social networking sites and restrictive eating, and it was found that the fear of negative appearance evaluation and body shame separately and serially mediated the relationship between discussing body-related topics on social networking sites and restrictive eating (Wang et al., 2023).

Impulsivity has also been effective on EBs in recent years. People classified as overweight and obese are reported to have deficits in food-specific impulse control (Flack et al., 2023). The hasty decision-making mechanism of impulsive individuals is considered a risk factor for EBs. Since impulsive behaviors lead to actions focused on instant rewards, individuals taking impulsive actions

are more sensitive to delicious foods containing sugar and fat (Bénard et al., 2019).

Body appreciation (BA) may also be affected by the negative consequences of impulsivity. In the literature, it is stated that individuals with high impulsivity have high body dissatisfaction, which may cause eating disorders (Scherr et al., 2010). Viewing idealized body images on social media causes increased body dissatisfaction among young women and men (Fioravanti et al., 2022). Targeting BA may support improvement in impaired EBs.

This study examines the relationships between EBs, BA, PIU, and impulsivity, drawing on dual-process decision-making theory (Hollander & Eyers, 2001) and reward sensitivity theory (Gullo & Dawe, 2008). These perspectives suggest that impulsivity plays a central role in decision-making and reward-driven behaviors. Based on this, two rival structural equation models (SEM) were developed to explore the mechanisms underlying EBs. In the hypothetical model, impulsivity is treated as an independent variable, while PIU and BA serve as mediators. This structure reflects the view of impulsivity as a relatively stable trait that predisposes individuals to maladaptive behaviors. In contrast, the alternative model positions impulsivity as a mediating variable, shaped by PIU and low BA. This model aligns with perspectives emphasizing the role of contextual and environmental factors in shaping impulsivity (Dickman, 1990). Comparing these two models enables a deeper understanding of the directionality and strength of these relationships. The hypothetical model was selected as the primary one due to its stronger theoretical foundation in personality and decision-making frameworks, while the alternative model offers a contrasting viewpoint to test the robustness of findings. Ultimately, this comparison offers insight into the mechanisms through which impulsivity influences EBs and enhances the empirical understanding of the interplay between trait-based and context-dependent theoretical frameworks.

Material and Methods

The study group consisted of 1003 young adults aged 18 – 35 who continued their education in the 2022 – 2023 academic year. Convenient sampling, one of the non-random sampling methods, was used to form the study group. In the convenience sampling method, researchers create a sample starting from the most accessible respondents until they reach the size needed (Büyüköztürk et al., 2016). Those with any diagnosed psychiatric disorder and those with a metabolic disorder that may affect any EB were not included in the analysis. With the outlier analysis, 51 participants were not included in the study group due to outlier values. The final sample set consisted of 828 participants. 70.4% of the participants were female, 29.6% were male, the average age was 21.08, the average body weight (kg) was 62.18, and the average height (cm) was 167.84. 14.6% of the participants were “underweight,” 68.4% had normal BMI, and 17% had high BMI.

Individuals were informed in writing about the purpose of the research and expectations before the data collection process, and after their consent was obtained through the informed consent form, they started to answer the measurement tools. This study has been approved by the Necmettin Erbakan University Social Sciences and Humanities Research Ethics Committee (decision no: 2022/143 dated 08/04/2022).

Personal Information Form

The Personal Information Form included demographic questions such as gender, age, anthropometric measurements (height and weight), educational background, marital status, and residential area.

Three-Factor Eating Questionnaire

The TFEQ-R21 (Karlson et al., 2000) is a 21-item scale assessing cognitive restraint, emotional eating, and uncontrolled eating. Items are rated on a 4-point Likert scale. Higher scores indicate greater tendencies in each domain. The Turkish version by Karakuş et al. (2016) preserved the original structure. In this study, Cronbach's alpha values were .84, .92, and .86 for the three subscales, respectively. The structural model established for CFA showed fit indices between excellent and acceptable: $\chi^2/df = 4.03$, CFI = .93, TLI = .92, RMSEA = .061 (Barret, 2007; Jöreskog, 2004; Kline, 2011; Tabachnick & Fidell, 2007).

Body Appreciation Scale

Developed by Avalos et al. (2005) and adapted into Turkish by Bakalın and Taşdelen-Karçkay (2016), the BAS includes 13 items rated on a 5-point Likert scale ("Never" to "Always"), measuring general BA and body image investment. Higher scores reflect greater appreciation. In this study, Cronbach's alpha was .92. The structural model established for CFA showed fit indices between excellent and acceptable: $\chi^2/df = 4.00$, CFI = .97, TLI = .95, RMSEA = .075 (Barret, 2007; Jöreskog, 2004; Kline, 2011; Tabachnick & Fidell, 2007).

Young Internet Addiction Test-Short Form

Developed by Pawlikowski et al. (2013) based on Young's (1998) original scale, the YIAT-SF includes 12 items rated on a 5-point Likert scale ("Never" to "Always") assessing PIU. Higher scores indicate greater risk. The Turkish version showed good reliability ($\alpha = .91$; Kutlu et al., 2016). In this study, Cronbach's alpha was .88. The structural model established for CFA showed fit indices between excellent and acceptable: $\chi^2/df = 4.57$, CFI = .93, TLI = .91, RMSEA = .074 (Barret, 2007; Jöreskog, 2004; Kline, 2011; Tabachnick & Fidell, 2007).

Barratt Impulsiveness Scale Short Form

The BIS-11-SF (Spinella, 2007) includes 15 items rated on a 4-point scale ("Rarely/Never" to "Almost Always/Always"), measuring Inability to Plan, Motor Impulsivity, and Attentional Impulsivity, with a total score calculated. Higher scores reflect greater impulsivity. The Turkish version showed good reliability ($\alpha = .82$; Tamam, Güleç, & Karataş, 2013). In this study,

Cronbach's alphas were .80, .77, .70, and .79 (total). CFA showed fit indices between excellent and acceptable: $\chi^2/df = 3.89$, CFI = .92, TLI = .90, RMSEA = .059 (Barret, 2007; Jöreskog, 2004; Kline, 2011; Tabachnick & Fidell, 2007).

Statistical Analysis

This study was conducted in accordance with the relational survey model methods to explain the relationships between EBs, BA, PIU and impulsivity. The relational survey model aims to determine whether there is a co-variation between two or more variables and, if so, its degree (Büyüköztürk et al., 2016). Structural equation modeling (SEM) was created to be tested in the study. Structural equation modeling is the general name of multivariate statistical analysis, which is a combination of factor analysis and regression analysis and is generally used to test models containing observed and latent variables (Tabachnick & Fidell, 2007). Structural equation modeling analysis was conducted with the AMOS 24 program. The statistical analyses were conducted using AMOS version 24.0 (IBM Corp., Armonk, NY, USA). The bootstrapping technique was used to test the mediation models. The bootstrapping technique is used in various fields, including finance, economics, and social sciences (Wang & Preacher, 2015).

Results

Testing Structural Models

In this section, in the hypothetical model, the effect of impulsivity on EBs through PIU and BA was tested in the general sample, in the male and female sample, in the high BMI sample, and in the normal BMI sample, respectively. This model was compared with the male and female groups, and normal BMI and high BMI groups, to reveal which study group best represented this model. Then, an alternative model was tested to test the effect of PIU and BA on EB through impulsivity in the general sample. Finally, these two different models were compared. On the path from PIU and BA to EB, solid lines indicate full mediation and dashed lines indicate partial mediation.

Hypothetical Model

General Sample

Figure 1 shows the structural model created in the general sample. According to the path parameters of the model, the path from Impulsivity to BA was statistically significant and negative ($\beta = -0.251$, $p < .001$). Impulsivity explained 6% of BM ($R^2 = 0.063$). The path from Impulsivity to PIU was statistically significant

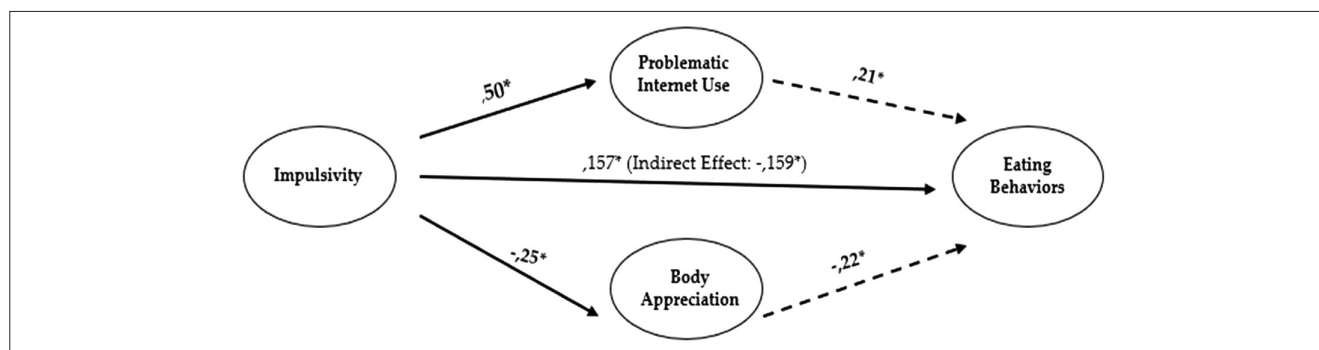


Figure 1. Structural Model of the General Sample, * $p < .05$.

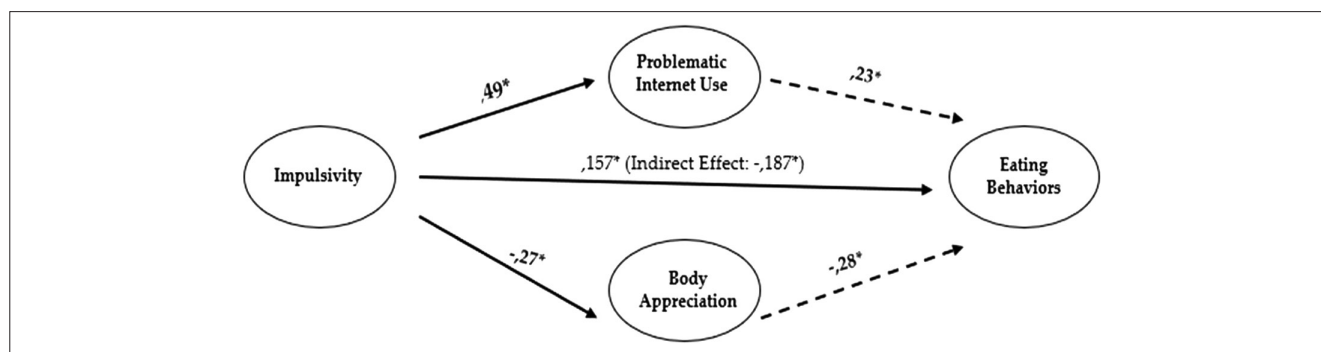


Figure 2. Structural Model of the Female Sample, *p < .05.

and positive ($\beta = 0.498, p < .001$). Impulsivity explained 25% of the PIU ($R^2 = 0.248$). The paths from BA ($\beta = -0.219$), PIU ($\beta = 0.210$), and impulsivity ($\beta = 0.157$) to EB were statistically significant ($p < .05$). The ratio of the three variables to explain EB was 18% ($R^2 = 0.178$). PIU and BA together had a partial mediation effect on the effect of Impulsivity on EB [95% CI (LB: 0.076, UB: 0.240)].

Female Sample

Figure 2 shows the structural model created for the female sample. According to the path parameters of the model, the path from Impulsivity to BA was statistically significant and negative ($\beta = -0.267, p < .001$). Impulsivity explained 7% of BA ($R^2 = 0.071$). The path from Impulsivity to PIU was statistically significant and positive ($\beta = 0.487, p < .001$). Impulsivity explained 24% of the PIU ($R^2 = 0.237$). The paths from BA ($\beta = -0.280$), PIU ($\beta = 0.230$), and impulsivity ($\beta = 0.135$) to EB were statistically significant ($p < .05$). The ratio of the three variables to explain EB was 22% ($R^2 = 0.217$). Problematic internet use and BA together had a partial mediation effect on the effect of Impulsivity on EB [95% CI (LB: 0.100, UB: 0.271)].

Male Sample

Dashed lines on the path from PIU and BA to EB indicate the absence of mediation.

Figure 3 shows the structural model created for the male sample. According to the path parameters of the model, the path from Impulsivity to PIU was statistically significant and positive ($\beta = 0.527, p < .001$). Impulsivity explained 28% of the PIU ($R^2 = 0.278$). Examining the paths from BA ($\beta = -0.20$), PIU ($\beta = 0.19$) and Impulsivity ($\beta = 0.250$) to EB, it was determined that only the path between Impulsivity and EB was statistically significant ($p < .05$). Problematic internet use and BA did not have a mediation effect together [95% CI (LB: -0.024, UB: 0.319)].

In Figures 2 and 3, the possible model for the indirect effects of Impulsivity on EB through PIU and BA was tested in the male and female samples. As seen in Table 1, in terms of AIC (Akaike Information Criterion) and ECVI (Expected Cross-Validation Index) values and goodness of fit indices as a result of the models (Barret, 2007; Jöreskog, 2004; Kline, 2011; Tabachnick & Fidell, 2007), it is understood that the *female sample group is the most

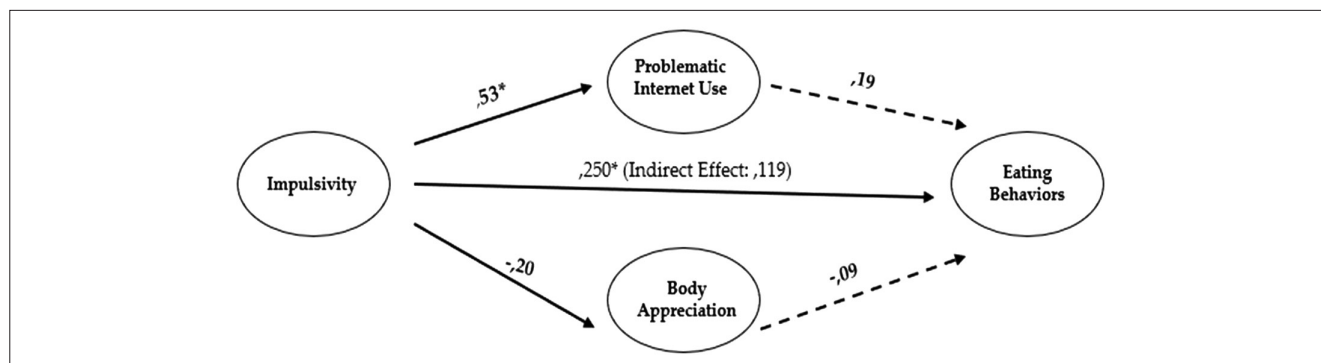


Figure 3. Structural Model of the Male Sample, *p < .05.

Table 1.
Goodness of Fit Values of Structural Models for Female and Male Samples

	(χ^2 /SD)	GFI	CFI	NFI	TLI	RMSEA	AIC	ECVI
*Female sample	2.064	0.853	0.895	0.865	0.901	0.043	2404.163	5.849
Male sample	1.586	0.850	0.863	0.852	0.856	0.049	2657.173	10.964

SD, Standard deviation; GFI, Goodness of Fit Index; CFI, Comparative Fit Index; NFI, Normed Fit Index; TLI, Tucker-Lewis Index, RMSEA, Root Mean Square Error of Approximation.

*The female sample model demonstrated the most preferable fit based on lower AIC and ECVI values and comparatively higher fit indices.

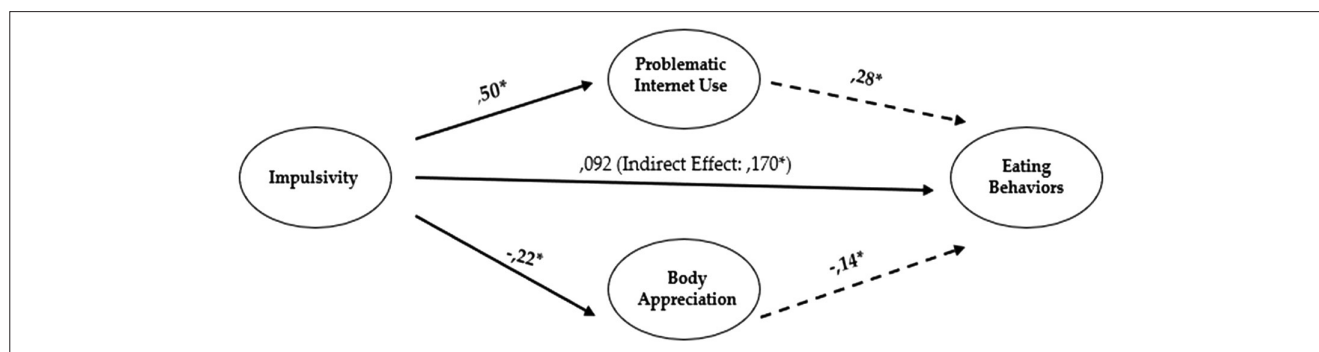


Figure 4. Structural Model of the BMI-Normal Sample, * $p < .05$. Solid lines from PIU and BA to EB indicate full mediation.

preferable model formed for the effect of Impulsivity on EB through PIU and BA.

Body Mass Index-Normal Sample

Figure 4 shows the structural model created in the BMI-normal sample. According to the path parameters of the model the path from Impulsivity to BA was statistically significant and negative ($\beta = -0.221, p < .05$). Impulsivity explained 5% of BA ($R^2 = 0.049$). The path from Impulsivity to PIU was statistically significant and positive ($\beta = 0.496, p < .001$). Impulsivity explained 25% of the PIU ($R^2 = 0.246$). Problematic internet use and BA together had a full mediation effect on the effect of Impulsivity on EB [95% CI (LB: 0.056, UB: 0.265)].

Body Mass Index-High Sample

Figure 5 shows the structural model created in the BMI-high sample. When the path parameters of the model are analyzed, there are 141 participants in the BMI-high sample group. In mediation models using bootstrap, the minimum sample sizes required in terms of statistical power vary between 40 and 1210 (Sim et al., 2022). Since the sample was sufficient in terms of statistical power, it was included in the model and analyzed.

According to the path parameters of the model created with the BMI-high sample, the path from Impulsivity to BA was statistically significant and negative ($\beta = -0.466, p < .05$). Impulsivity explained 22% of BA ($R^2 = 0.217$). The path from Impulsivity to PIU was statistically significant and positive ($\beta = 0.569, p < .05$). Impulsivity explained 32% of the PIU ($R^2 = 0.323$). Examining the paths from BA ($\beta = 0.296$), PIU ($\beta = -0.364$), and impulsivity ($\beta = -0.123$) to EB, the paths of the three relevant variables were not statistically significant ($p > .05$).

In Figures 4 and 5, the possible model for the indirect effects of Impulsivity on EB through PIU and BA in the BMI-normal and BMI-high samples was tested. As seen in Table 2, in terms of AIC and ECVI values and goodness of fit indices as a result of the models, (Barret, 2007; Jöreskog, 2004; Kline, 2011; Tabachnick & Fidell, 2007), it is understood that the *BMI-normal sample group is the most preferable model formed for the effect of Impulsivity on EB through PIU and BA.

Alternative Model

General Sample

In Figure 6, the alternative structural model created in the general sample shows the mediation role of Impulsivity in the effect of PIU and BA on EB. Figure 6 shows that the path from BA to Impulsivity was statistically significant and negative ($\beta = -0.156, p < .001$), while the path from PIU to Impulsivity was statistically significant and positive ($\beta = 0.447, p < .001$). The ratio of two variables together explaining I was 25% ($R^2 = 0.251$). The path from Impulsivity ($\beta = 0.145$), PIU ($\beta = 0.222$), and BA ($\beta = -0.228$) to EB was statistically significant. Impulsivity partially mediated the effect of PIU on EB [95% CI (LB: 0.019, UB: 0.124)]. Impulsivity partially mediated the effect of BA on EB [95% CI (LB: -0.048, UB: -0.005)].

Figure 1 and Figure 6 show the hypothetical and alternative models in the general sample. As seen in Table 3, in terms of AIC and ECVI values and goodness of fit indices as a result of the models, (Barret, 2007; Jöreskog, 2004; Kline, 2011; Tabachnick & Fidell, 2007), it is understood that the *alternative model that PIU and BA affect EB through impulsivity is the most preferable model.

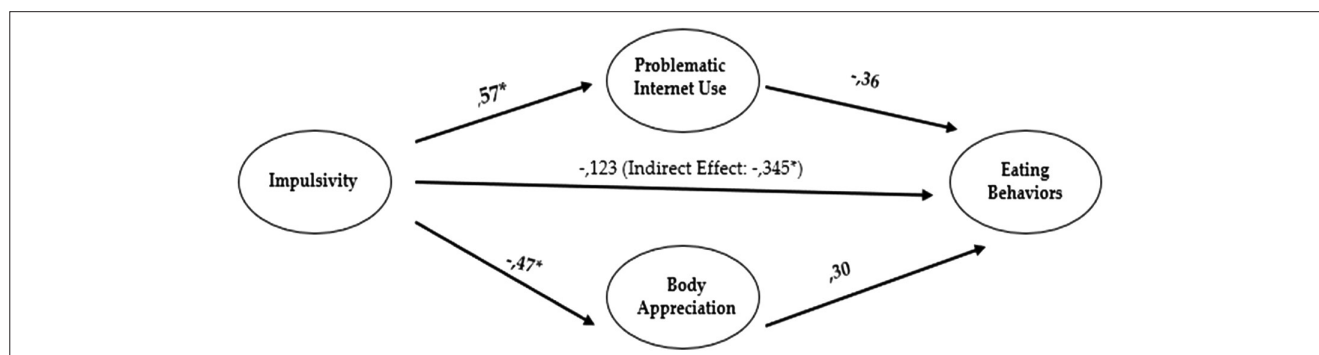


Figure 5. Structural Model of the BMI-High Sample, * $p < .05$.

Table 2.
Goodness of Fit Values of Structural Models for BMI-Normal and BMI-High Sample Groups

	(χ^2 /SD)	GFI	CFI	NFI	TLI	RMSEA	AIC	ECVI
*BMI-normal sample	1.992	0.866	0.896	0.851	0.891	0.042	3293.187	5.829
BMI-high sample	1.523	0.852	0.806	0.593	0.796	0.061	2579.952	18.428

Note: SD = Standard deviation.

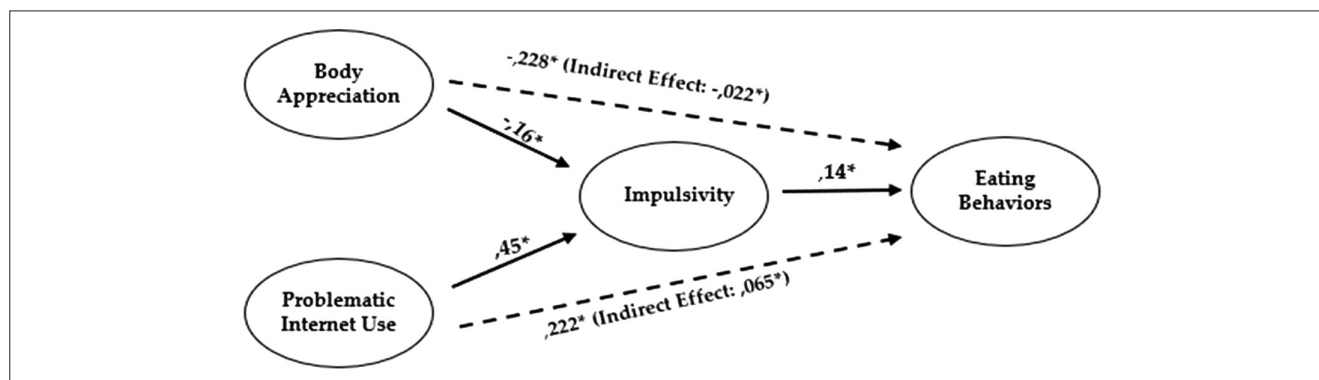


Figure 6. General Sample Alternative Structural Model, *p < .05.

Discussion

When the female and male sample groups were compared, the female sample group better represented the hypothetical model. Studies show that the frequency of EB disorder is higher in women than in men (Kartal & Aykut, 2019). This may be due to the fact that women, compared to men, are more preoccupied with behaviors such as maintaining body shape, body weight, and dieting, which support their attention, focus, and planning abilities. In a similar study, women were much more likely than men to report using an organized weight loss program to lose weight (Crane et al., 2017). In a longitudinal study on female college students, problematic Facebook use was associated with increased body dissatisfaction after 4 weeks, and decreases in BA and increases in EB were observed in its relationship with problematic Facebook use (Smith et al., 2013). More frequent use of pro-eating disorder websites by college women was associated with higher levels of body dissatisfaction, drive for thinness, and bulimic symptoms (Harper et al., 2008). Body appreciation is often problematic in women due to social pressures to be thin. In a similar study, negative body talk within the family was positively associated with emotional eating, and body dissatisfaction significantly mediated this relationship (Yang et al., 2023). Another study found that body shame was more common among women with higher BMI, but not among men. As women’s BMI increases, they may feel more shame, which is also associated with restrictive eating.

In the same study, impulsivity was associated with body shame, negative affect, and eating-related cognitions (Mason & Lewis, 2015). In women, negative mood and high emotional eating measures were associated with lower BA (Annesi, 2022). In a study on women with orthorexia tendency, a significant negative relationship was found between internet use and positive emotions associated with healthy eating habits (Waterman et al., 2022). In summary, the model in this study, created on young adult women, was generally supported in the relationship between similar studies in the literature.

When the BMI-normal and BMI-high samples were compared, the BMI-normal sample group better represented the hypothetical model. A study on young adults with normal BMI showed that social media addiction both directly and indirectly increased emotional eating, and that social media addiction was significantly associated with higher levels of body image anxiety, and body image anxiety was significantly associated with emotional eating (Mohsenpour et al, 2023). Another study revealed that there was a relationship between the frequency of comparing one’s own physical appearance with that of the people one follows on social media and body dissatisfaction and the drive to be thin, and that BMI did not have any effect on this process (Jiotsa et al., 2021). The term fat-negative body image can also be used to describe the excessive weight loss of young adults who think they are fat (negative body image) due to concern about

Table 3.
Goodness of Fit Values of Hypothetical and Alternative Models in the General Sample

	(χ^2 /SD)	GFI	CFI	NFI	TLI	RMSEA	AIC	ECVI
Hypothetical model	2.355	0.859	0.904	0.855	0.899	0.043	3846.064	4.651
*Alternative model	2.319	0.882	0.927	0.857	0.922	0.040	3790.774	4.584

Note: SD = Standard deviation.

their bodies, even if they are of normal weight ($18 \leq \text{BMI} < 23.5$). People with a fat-negative body perception schema have attentional bias towards body size and food stimulation and show selective preferences at different stages of information processing, such as attention, interpretation, and memory (Ralph-Nearman et al., 2019). This may cause impulsivity to negatively affect BA in young adults. Therefore, young adults may have a normal BMI but have problems with body perception. In the study by Radvan et al. (2019), a high rate of body perception dissatisfaction was observed, although the prevalence of excessive weight and obesity was low. Among normal weight students, those who perceived themselves as underweight or overweight were more likely to vomit, fast, use laxatives, and diet pills (Silva et al., 2018). In a study, the effect of negative and positive affect on disordered eating symptoms was tested through its effect on intuitive eating and body image flexibility, while the effect of BMI was controlled and addressed with a path model. The model revealed that the effect of negative and positive affect on disordered eating symptoms depends on the level of intuitive eating and body image flexibility, even when the effect of BMI is controlled. It was also explained to be a protective factor against disordered EB by reducing reactivity and impulsive eating in response to negative and positive affect (Cardoso et al., 2020). In summary, risk factors such as PIU, which may cause a deterioration in the perception of BA, may negatively affect EBs even if the BMI of the individual is normal.

When the hypothetical and alternative models were compared, the alternative model explained this model better. Impulsivity supported both models when it was considered as an independent variable in the hypothetical model and as a mediating variable in the alternative model. This finding supports that impulsivity has a multifaceted effect rather than a fixed and linear effect. In his study, Dickman (1990) indicates that impulsivity is a multifaceted structure, a combination of various phenomena and not a single type of impulsive behavior. This shows that this study also emphasizes the importance of considering the potential risks of impulsivity. In this study, impulsivity suggests a better model in the mediating role. While impulsivity is considered a core symptom of many psychiatric disorders (Hollander & Eysers, 2001), PIU can be explained as a behavioral reflection of these disorders. Many studies explain that psychiatric disorders, such as eating disorders, manifest themselves with excessive internet use (Mahmid et al., 2021; Wang et al., 2023). The increase in the tendency towards EBs, which have a pleasurable role (Shipton, 2017), as a result of the directive effect of PIU on novelty-seeking and risk-taking behaviors (Karaca, 2019) and the over-sensitivity aspect of impulsivity to reward-seeking sensitivity (Gullo ve Dawe, 2008) shows that the literature supports the current model.

These findings reinforce the conceptualization of impulsivity as a transtheoretical construct that underlies a variety of psychological difficulties through its interaction with cognitive and affective mechanisms (Prochaska, 2008). From a transtheoretical perspective, impulsivity can be conceptualized as a psychological vulnerability factor that transcends diagnostic categories and plays a role in the emergence and maintenance of various maladaptive behaviors. Rather than being confined to a single diagnostic category, impulsivity functions as a transdiagnostic risk factor—closely linked to cognitive distortions, emotional regulation

deficits, and attentional biases (Belloch, Roncero, & Perpiñá, 2016; Pearlstein et al., 2024). Within this framework, impulsivity may contribute not only to the persistence of disordered eating but also to compulsive behaviors such as PIU and gaming disorder, where similar cognitive-affective processes are involved. Framing impulsivity as a shared psychological substrate across diagnostic boundaries provides a broader understanding of how self-regulatory breakdowns manifest in distinct yet overlapping behavioral domains.

Limitations and Suggestions for Future Research

In conclusion, this study demonstrated that the hypothetical model better fit the general sample, female participants, and those with normal BMI, while the alternative model, in which impulsivity served as a mediating variable, offered a stronger overall explanation. These findings highlight impulsivity as a significant factor influencing both EB and PIU. Although the study sample consisted of university students, future research should include individuals from diverse age groups, educational levels, and clinical backgrounds to enhance external validity. Moreover, with the increasing prevalence of compulsive digital behaviors such as gaming disorder, it is essential to examine impulsivity within broader behavioral addiction frameworks. Addressing impulsivity as a transdiagnostic mechanism may improve early identification and intervention strategies in at-risk populations.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

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ORIGINAL ARTICLE

Smartphone-Related Distractibility, Flow, and Short Video Addiction: Implications for the Mental Health of Pre-Service Special Education Teachers

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Main Points

- Smartphone-related distractibility significantly predicts both short video flow and short video addiction, highlighting multiple pathways of risk for pre-service special education teachers.
- Short video flow partially mediates the relationship between distractibility and addiction, explaining how motivational immersion can simultaneously foster engagement and reinforce problematic use.
- The integrated application of Flow Theory, Compensatory Internet Use Theory, and Uses and Gratifications Theory provides a novel explanatory framework for teachers' digital media behaviors.
- Findings emphasize that digital distractibility threatens attentional control and professional efficacy in special education contexts, where cognitive and emotional resources are especially critical.
- Results call for teacher education programs and policy initiatives that embed digital attention management and well-being competencies to mitigate risks and strengthen professional practice.

Abstract

The rapid growth of short video platforms such as TikTok, Instagram Reels, and YouTube Shorts has heightened concerns about smartphone-related distractibility, flow experiences, and addictive engagement. Excessive use of these platforms has been linked to attention deficits, stress, and diminished psychological well-being, yet little is known about these processes among pre-service special education teachers—a group requiring high levels of attentional control for their future professional roles. This study examined the explanatory role of short video flow in the relationship between smartphone-related distractibility and short video addiction. It aimed to integrate Flow Theory, Compensatory Internet Use Theory, and Uses and Gratifications Theory to explain how motivational, compensatory, and gratification-seeking mechanisms jointly contribute to addictive short video use and its mental health implications. Participants were 323 pre-service special education teachers (42.4% male, 57.6% female; $M = 20.54$, standard deviation = 2.73). Validated self-report measures were administered, including the Smartphone-Related Distractibility Scale, the Short Video Flow Scale, and the Short Video Addiction Scale. Structural equation modeling with bootstrapping was employed to test direct and indirect effects. Smartphone-related distractibility was positively associated with short video flow ($\beta = .569, p < .001$) and short video addiction ($\beta = .263, p < .001$). Short video flow significantly mediated the relationship between distractibility and addiction ($\beta = .343, 95\% \text{ CI } [.249, .418], p < .001$). The partial mediation model provided the best fit ($\chi^2/df = 2.50$; Comparative Fit Index (CFI) = .989; Tucker-Lewis Index (TLI) = .975; Root Mean Square Error of Approximation (RMSEA) = .068). The model accounted for 42% of the variance in flow and 51% of the variance in addiction, indicating substantial explanatory power. These findings suggest that flow experiences play an important role in explaining how digital distractibility relates to problematic short video use. The results also highlight the importance of supporting digital attention skills and promoting well-being practices within teacher education programs.

Keywords: Pre-service special education teachers, short video addiction, short video flow, smartphone-related distractibility

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Introduction

The widespread integration of smartphones into daily life has transformed numerous domains on a global scale, ranging from communication and entertainment to education. International reports indicate that smartphone usage rates exceed 90% among young adults in both developed and developing countries (Pew Research Center, 2023; Statista, 2024). While smartphones offer unparalleled opportunities for access to information and connectivity, an increasing number of cross-cultural studies reveal their associations with challenges such as sustained attention deficits, impulsivity, and cognitive overload (Billieux, 2012; Montag et al., 2021). These risks have become even more salient with the rapid rise of short video platforms such as TikTok, YouTube Shorts, and Instagram Reels, which have gained significant popularity across Asia, North America, and Europe (Anderson, 2023; Zhang et al., 2023). Research conducted in different cultural contexts demonstrates that excessive use of these platforms is associated with impairments in executive functioning, weakened attentional control, and heightened tendencies toward addiction (Chen et al., 2023; Smith et al., 2022; Ye et al., 2025). Longitudinal studies in both Western and Eastern societies further show that these platforms—characterized by algorithmic personalization and fast-paced content streams—reinforce compulsive use and attention-related difficulties (Zhao & Wagner, 2023; van Driel et al., 2022). Collectively, these findings underscore the urgent need to investigate how short video use intersects with attention regulation and addiction across diverse sociocultural contexts.

Flow Theory (Csikszentmihalyi, 1990), Compensatory Internet Use Theory (CIUT; Kardefelt-Winther, 2014), and Uses and Gratifications Theory (UGT; Katz et al., 1974) provide complementary, and at times contradictory, perspectives on the psychological underpinnings of short video use. Flow Theory emphasizes the positive effects of concentration and immersion experiences on learning and motivation. For instance, flow experiences during teachers' engagement with professional content have been shown to enhance learning outcomes (Hamari et al., 2016). However, the same process may also diminish self-regulation, obscure time awareness, and induce distractibility, thereby increasing the risk of addiction (Zhao & Wagner, 2023). Thus, flow can yield both positive (motivation, learning) and negative (addiction, attentional disruption) outcomes in the context of short video use. Compensatory Internet Use Theory extends this discussion by suggesting that individuals use digital media not only for intrinsic pleasure but also to compensate for negative emotions such as stress, anxiety, and loneliness (Kardefelt-Winther, 2014). For example, Chen and Zhong (2022) found that teachers frequently employ social media as a coping mechanism to manage workload and professional stress. Similarly, Smith et al. (2023) demonstrated that short video consumption serves a compensatory function, particularly among teachers experiencing loneliness and burnout, but may simultaneously undermine academic performance and classroom management. Uses and Gratifications Theory situates these processes within a broader framework, positing that users actively seek gratifications such as entertainment, social connection, or information (Sundar & Limperos, 2013). Also, Wong et al. (2015) reported that teachers primarily use social media for professional content sharing and seeking social support, while Jones and Patel (2022) highlighted the role of short video platforms in knowledge acquisition and

professional community building. These three theories collectively provide a multidimensional understanding of short video engagement—where flow explains the depth of immersion, CIUT reveals compensatory motives, and UGT identifies the gratifications users pursue.

In the Turkish context, several studies have documented the increasing prevalence of social media and smartphone dependency among in-service teachers. For instance, Döş and Özşahin (2019) found that social media addiction was negatively correlated with teachers' self-efficacy and motivation levels in a sample of 289 teachers from Adıyaman-Besni. Similarly, Tekin (2019) reported that 53% of teachers showed moderate to high levels of social media addiction, which was positively associated with procrastination tendencies. Karataş and Gül (2023) also highlighted that frequent social media engagement during working hours could interfere with teachers' professional productivity and instructional focus. In addition, Avcı (2020) revealed that teachers often perceive social media as “addictive,” “distracting,” and “time-consuming,” developing metaphors that emphasize its negative impact on attention and professional engagement. Collectively, these findings suggest that problematic social media use among teachers may undermine professional efficacy and increase procrastination. However, despite these insights, limited attention has been given to short video – based social media platforms (e.g., TikTok, Reels), which have rapidly become dominant in Türkiye's digital ecosystem. Addressing this gap is crucial for understanding how the global trend of short video consumption manifests within the professional and cultural context of Turkish teachers. Therefore, examining the motivational, compensatory, and gratification-oriented processes underlying teachers' digital media use is of critical importance.

Accordingly, the primary aim of this study is to examine the explanatory role of flow experiences in the relationship between smartphone-related distractibility and short video addiction within the context of pre-service special education teachers. The theoretical contribution of this study lies in synthesizing theories often applied separately to explain teachers' digital media interactions, while its practical contribution is to inform interventions that may strengthen the professional practices of special education teachers.

Research Hypotheses

H1: There is a positive relationship between smartphone-related distractibility and short video addiction.

H2: There is a positive relationship between smartphone-related distractibility and short video flow.

H3: There is a positive relationship between short video flow and short video addiction.

H4: Short video flow plays an explanatory role in the relationship between smartphone-related distractibility and short video addiction.

Material and Methods

Participants and Procedure

The study sample consisted of 323 pre-service special education teachers. Participants' ages ranged between 18 and 45 years, with a mean age of 20.54 (standard deviation = 2.73). Regarding

gender distribution, 42.4% were male ($n = 137$) and 57.6% were female ($n = 186$). Socioeconomic status distribution was as follows: 23.8% low, 69.7% middle, and 6.5% high. Participants reported their daily screen time using four categories: 0 – 1 hours, 1 – 2 hours, 2 – 3 hours, and more than 3 hours. Among the 323 participants, 45 (14%) reported 0 – 1 hour, 120 (37%) reported 1 – 2 hours, 95 (29%) reported 2 – 3 hours, and 63 (20%) reported more than 3 hours per day on their smartphones. Regarding the most frequently used short video platforms, Instagram Reels was the most popular, used by 120 participants (37%), followed by TikTok with 95 participants (29%), YouTube Shorts with 85 participants (26%), and Facebook Watch with 23 participants (8%).

Research data were collected online on a voluntary basis. Participants were informed about the aim of the study, principles of confidentiality, and voluntary participation. Only individuals who provided written informed consent could access the survey form. Prior to data collection, ethical approval was obtained from the Ethics Committee of the researcher's university, and all procedures were conducted in accordance with ethical principles. Data were collected between March and May 2024 from pre-service special education teachers enrolled at three public universities in central Türkiye. Participants were recruited through online announcements shared via university mailing lists and social media platforms (e.g., WhatsApp groups for pre-service teachers). Participation was voluntary, and no incentives were provided. To prevent duplicate responses, the survey platform was configured to allow only one submission per account/Internet Protocol (IP) address.

Ethical approval for the study was obtained from the Ethics Committee of Trakya University (Approval No.: 07/03; Date: February 5, 2024). All procedures complied with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments.

Measures

Smartphone-Related Distractibility Scale

Smartphone-related distractibility was measured using a 16-item, four-factor scale developed by Throuvala et al. (2021) and adapted into Turkish by Bilge et al. (2022). The subdimensions were: Attention/Impulsivity, Online Vigilance, Multitasking, and Emotion Regulation. Reliability analyses based on Cronbach's alpha showed values of .88 for Attention/Impulsivity, .80 for Online Vigilance, .76 for Multitasking, and .76 for Emotion Regulation. Item – total correlations ranged from .49 to .76, indicating satisfactory internal consistency. Confirmatory factor analysis supported the four-factor structure of the 16-item scale. All items were rated on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree). Sample items include: "Notifications from my phone distract me" (Attention/Impulsivity), "I feel anxious if I do not immediately check messages on my phone" (Online Vigilance), "I use multiple apps on my phone while working" (Multitasking), and "Using my phone prevents me from engaging in unpleasant activities" (Emotion Regulation). Higher scores indicate greater levels of distractibility related to smartphone use. There are no established cut-off points; thus, scores were treated as continuous variables. In the present study, Cronbach's alpha coefficients were .837 for Attention/Impulsivity, .795 for Online Vigilance, .703 for Multitasking, and .752 for Emotion Regulation.

Short Video Flow Scale

Short video flow was assessed using the Short Video Flow Scale developed by Ye et al. (2025) and adapted into Turkish by Türk and Yıldırım (2023). The Short Video Flow Scale (SVFS) is a unidimensional scale consisting of eight items. Items are rated on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree), with scores ranging from 8 to 40. Higher scores indicate stronger flow experiences during short video watching. The internal consistency coefficient was $\alpha = .87$ in the original study, with item – total correlations ranging from .56 to .76. Confirmatory factor analysis results supported the single-factor structure. A sample item is: "While watching short videos, I lose track of time and continue watching without realizing how much time has passed." In the present study, the Cronbach's alpha coefficient was .855.

Short Video Addiction Scale

Short video addiction was measured using the Short Video Addiction Scale (SVAS), developed based on the Video Addiction Scale by Ye et al. and adapted into Turkish by Türk and Yıldırım (2023). The SVAS consists of 10 items with a unidimensional structure. Responses are rated on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree), with total scores ranging from 10 to 50. Higher scores indicate greater short video addiction. Reliability analyses revealed a Cronbach's alpha coefficient of .82 in the original study. Item – total correlations ranged from .45 to .72, confirming item consistency. Confirmatory factor analysis supported the unidimensional structure. A sample item is: "I spend more time watching short videos than I planned." In the present study, Cronbach's alpha was .893.

Data Analysis

First, descriptive statistics were calculated for the study variables, followed by correlation analyses to examine the relationships among them. To test the theoretical model and evaluate causal relationships between the variables, a two-step structural equation modeling procedure was conducted. Structural equation modeling is a comprehensive statistical technique that allows simultaneous testing of multivariate relationships between observed and latent variables (Kline, 2015; Hoyle, 2012).

Model validity was evaluated using several fit indices and established threshold values: $\chi^2/df < 5$, Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), Incremental Fit Index (IFI), and Tucker-Lewis Index (TLI) $\geq .90$, and standardized root mean square residual (SRMR) and RMSEA $\leq .08$ were considered indicators of good model fit (Hu & Bentler, 1999; Schermelleh-Engel et al., 2003). Finally, the bootstrapping method was employed to test direct and indirect effects, as it is widely recommended for producing robust results in mediation analyses (Preacher & Hayes, 2008).

Results

Preliminary Analyses

Descriptive statistics and correlation analysis findings of the variables are presented in Table 1. The skewness values of the variables ranged between -1.163 and $.865$, while the kurtosis values ranged between $.878$ and 2.681 . According to Browne and Cudeck (1993), skewness values between -3 and $+3$ and kurtosis values between -10 and $+10$ are acceptable for ensuring normality. In this context, the results fell within acceptable ranges, indicating that all variables exhibited normal distribution characteristics.

Table 1.
Descriptive Statistics and Correlations

Variables	M	SD	Skewness	Kurtosis	1	2	3	4	5	6
1. Short video flow	19.97	5.76	.708	.726	–					
2. Short video addiction	25.99	7.32	.259	.323	.752***	–				
3. Attention/Impulsivity	11.59	3.19	.020	–.101	.432***	.456***	–			
4. Online vigilance	10.67	3.41	.295	–.067	.472***	.469***	.678***	–		
5. Multitasking	11.50	2.84	.034	–.050	.327***	.368***	.421***	.460***	–	
6. Emotion regulation	11.05	3.04	–.051	–.019	.434***	.496***	.550***	.551***	.519***	–

*** $p < .001$.**Structural Model**

In the first step of the analysis, a fully mediated model was tested in which the effect of smartphone-related distractibility on short video addiction was assumed to occur only through short video flow. The model fit indices indicated that the proposed structure demonstrated an adequate fit with the data: $\chi^2(8, N = 323) = 24.958$; $\chi^2/df = 3.12$, $p = .002$; GFI = .973; CFI = .980; NFI = .971; IFI = .980; TLI = .963; SRMR = .0300; RMSEA = .081 [.046 – .118]. To evaluate the robustness of the hypothesized mediation model, alternative models were also tested. A partial mediation model, in which smartphone-related distractibility was allowed to predict short video addiction both directly and indirectly via short video flow, was compared with the full mediation model. Results indicated that the partial mediation model provided a significantly better fit to the data ($\Delta\chi^2 = 7.46$, $\Delta df = 1$, $p < .01$). This finding supports the view that both direct and indirect pathways contribute to the relationship between smartphone-related distractibility and short video addiction. The full mediation model demonstrated (Table 2) acceptable fit ($\chi^2_{(8)} = 24.96$, $\chi^2/df = 3.12$, CFI = .980, TLI = .963, RMSEA = .081 [.046 – .118], SRMR = .030). In comparison, the partial mediation model showed improved fit ($\chi^2_{(7)} = 17.50$, $\chi^2/df = 2.50$, CFI = .989, TLI = .975, RMSEA = .068 [.032 – .103], SRMR = .028). The chi-square difference test confirmed that the partial mediation model fit the data significantly better than the full mediation model ($\Delta\chi^2 = 7.46$, $\Delta df = 1$, $p = .006$). The structural relationships and standardized path coefficients of this model are presented in Figure 1.

Bootstrapping

The bootstrapping method was employed to test the proposed model. The standardized path coefficients are displayed in Figure 1. Accordingly, the indirect effect coefficients and their 95% CIs are presented in Table 3.

Direct and Indirect Effects

When examining the standardized direct effect coefficients, the effect of smartphone-related distractibility (SRDS) on SVFS was found to be significant ($\beta = .569$, $p < .001$). In addition, SRDS significantly predicted the subdimensions of distractibility:

Emotional Impulsivity ($\beta = .724$, $p < .001$), Multitasking ($\beta = .592$, $p < .001$), Online Vigilance ($\beta = .811$, $p < .001$), and Attention/Impulsivity ($\beta = .788$, $p < .001$). Moreover, the direct effect of SRDS on SVAS was also statistically significant ($\beta = .263$, $p < .001$).

The proposed mediational pathways were also tested. The indirect effect of SRDS on SVAS through SVFS was significant ($\beta = .343$, 95% CI [.249, .418], $p < .01$). This finding indicates that the flow experience during short video use partially mediates the relationship between smartphone-related distractibility and short video addiction.

Overall, these results demonstrate that both direct and indirect effects in the model are significant, supporting the notion that the influence of smartphone-related distractibility on short video addiction operates through multiple pathways. In particular, short video flow emerges as a critical mediating mechanism in this relationship.

The model accounted for 42% of the variance in short video flow ($R^2 = .42$) and 51% of the variance in short video addiction ($R^2 = .51$), indicating moderate-to-large explanatory power (Cohen, 1988). Effect size estimates further supported the practical significance of the findings: the direct effect of smartphone-related distractibility on short video addiction corresponded to a medium effect size ($f^2 = .15$), while the indirect effect via short video flow reflected a large effect ($f^2 = .25$) (Kruschke, 2015). The model's SRMR (SRMR = .030) also confirmed a good fit, reinforcing the robustness of the hypothesized relationships.

Discussion

The findings of this study reveal that teachers' experiences of distractibility, particularly in the context of short video platforms, have both positive and negative implications. Consistent with Flow Theory, short videos can provide intense concentration and immediate gratification, highlighting their motivational value. However, sustained engagement depletes teachers' cognitive resources, leading to increased distractibility and addictive

Table 2.
Model Fit Indices for Full and Partial Mediation Models

Model	χ^2 (df)	χ^2/df	CFI	TLI	RMSEA [90% CI]	SRMR
Full mediation model	24.96 (8)	3.12	.980	.963	.081 [.046 – .118]	.030
Partial mediation model	17.50 (7)	2.50	.989	.975	.068 [.032 – .103]	.028

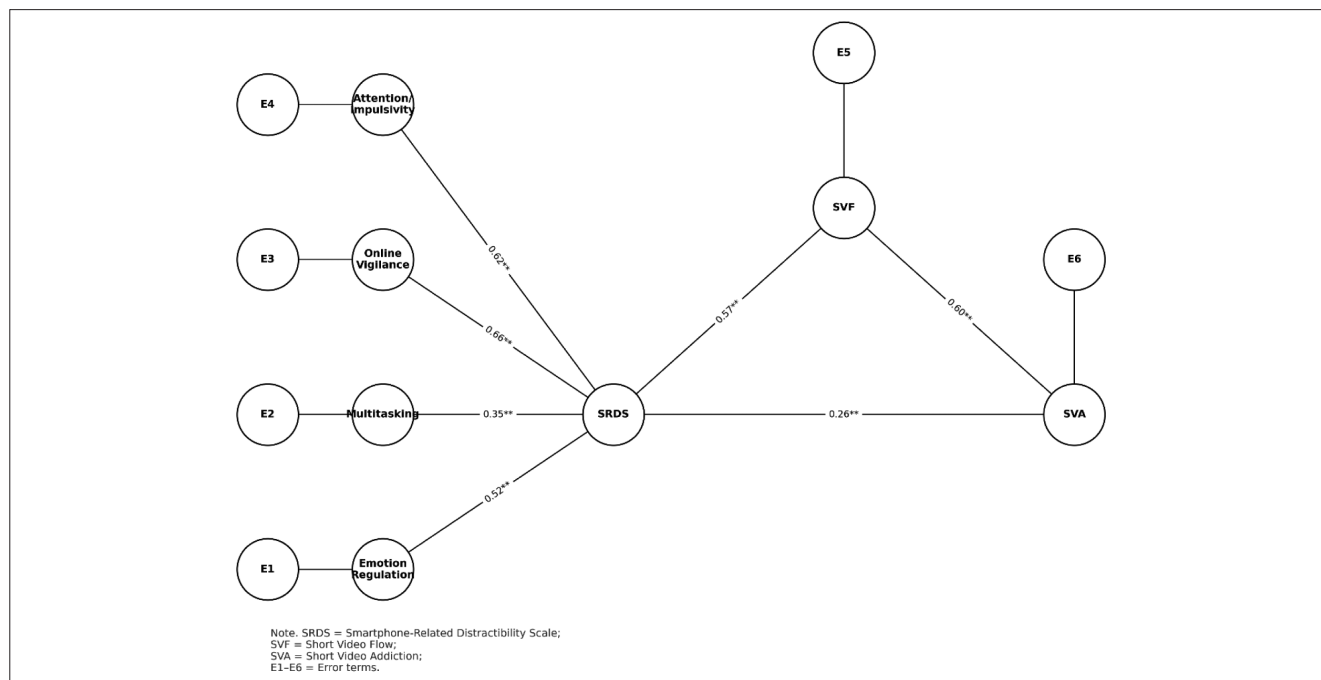


Figure 1. Structural Model.

behaviors. This duality confirms the tension between Flow’s “optimal experience” and its “absorption” dimensions, which may foster distraction and problematic use (Csikszentmihalyi, 1990; Tateno et al., 2019). Beyond statistical significance, the model explained a substantial proportion of variance in both short video flow (42%) and short video addiction (51%), underscoring the practical importance of smartphone-related distractibility in shaping teachers’ digital behaviors.

This study makes a distinctive theoretical contribution by integrating Flow Theory, CIUT, and UGT within a single explanatory model. While each framework has been applied separately in digital media research, their combined use in the context of pre-service special education teachers is novel. This integrative approach demonstrates how motivational immersion (Flow), compensatory coping (CIUT), and goal-directed gratifications (UGT) jointly shape distractibility and short video addiction. More importantly, by applying this synthesis to teacher education, the study extends educational psychology literature and

introduces a new perspective on how digital behaviors intersect with professional competencies. This originality lies in moving beyond single-theory explanations and offering a multi-layered framework that captures both the motivational and detrimental aspects of short video use.

A particularly salient finding is that short video – induced distractibility is especially consequential for special education teachers. Working with cognitively and behaviorally vulnerable students requires higher levels of patience, persistence, and attentional control (Pellicano et al., 2022; Smith et al., 2023). The results suggest that intensive short video use compromises these skills, thereby indirectly affecting student learning. Previous studies have highlighted that problematic media use undermines classroom practices (Chen & Zhong, 2022; Wong et al., 2015), but very few have examined this issue within special education contexts. This study addresses this gap by showing that special education teachers face a dual burden: sustaining professional responsibilities while contending with distracting digital environments.

Furthermore, evidence from pre-service teachers indicates that such risks emerge even before professional entry. For example, Brown et al. (2023) reported that short video addiction tendencies were inversely related to teaching self-efficacy beliefs, highlighting the threat of distractibility for both teacher preparation and long-term professional development.

When interpreting these findings, it is also important to consider the cultural and educational context in which the study took place. In Türkiye, teacher education programs have become increasingly digitalized in recent years, yet the topic of digital well-being and attention management has not received sufficient emphasis in formal training. The popularity of platforms such as TikTok, Instagram Reels, and YouTube Shorts among university students reflects a wider cultural trend toward rapid, high-stimulation media use. Therefore, the present findings may partly

Table 3.
Indirect Effects for the Mediation Model

Model Pathways	Direct Effect (β)	Indirect Effect (β)	95% CI Lower	95% CI Upper
SRDS → SVFS	.569***	–	–	–
SRFS → SVAS	.343***	–	–	–
SRDS → SVAS (Direct)	.263***	–	–	–
SRDS → SVFS → SVAS (Indirect)	–	.343***	.249	.418

Note: SRDS = Smartphone-Related Distractibility Scale; SVFS = Short Video Flow Scale; SVAS = Short Video Addiction Scale.
****p* < .001.

mirror these sociocultural tendencies, suggesting that teachers' digital distractibility is influenced not only by individual factors but also by the broader digital environment in which they are trained.

In addition to these cultural factors, national policies and initiatives in Türkiye have increasingly addressed digital media use and well-being among educators. The Ministry of National Education (Millî Eğitim Bakanlığı, MEB) has introduced several digital literacy and teacher training programs emphasizing responsible technology use and classroom attention management (MEB, 2023). Similarly, the Green Crescent (Yeşilay) has developed nationwide campaigns and educational modules aimed at preventing digital addiction among both students and teachers (Yeşilay, 2021). Integrating such institutional efforts with teacher education curricula could further strengthen awareness and behavioral regulation regarding short video use. Therefore, the findings of this study not only align with but also provide empirical support for these ongoing national initiatives, underscoring the need for their systematic inclusion in pre-service teacher programs.

Beyond theoretical insights, the findings offer several implications for teacher education and policy. Teacher education curricula should include structured modules on digital attention management, addressing strategies for cognitive load regulation, minimizing distraction from short-form content, and understanding the mechanisms of algorithmic reinforcement. Such training can help pre-service teachers develop sustainable digital habits prior to professional entry.

At the institutional level, faculties of education should establish clear guidelines for responsible digital media use and organize workshops promoting self-regulation strategies. At the national level, policymakers might consider incorporating digital well-being competencies into teacher standards, particularly in special education programs where attentional demands are higher. Linking these recommendations to existing evidence on teachers' digital competence and professional performance (e.g., García-Martín & Cantón-Mayo, 2019; van Driel et al., 2022; Zhao & Wagner, 2023) would also strengthen their empirical grounding and make them more actionable.

Limitations and Directions

Several limitations should be acknowledged. First, the study relied on self-report measures, which may be influenced by social desirability bias and common method variance. Second, the research was conducted with pre-service special education teachers in a single national context, which limits the generalizability of the findings to other teacher populations and to in-service educators who may experience different digital and professional conditions.

Additionally, certain personal factors that could have affected the results—such as personality traits, impulsivity, or overall screen time habits—were not included in the analysis. Future studies could incorporate these variables to better understand how individual characteristics shape distractibility and short video engagement.

Another limitation concerns the assumption that all short video platforms function similarly. In reality, applications like TikTok, Instagram Reels, and YouTube Shorts vary in their design,

algorithms, and user interactions. Recognizing these differences would allow for a more nuanced understanding of how platform-specific features influence user attention and flow experiences.

Although an integrated theoretical model was tested, causal relationships among the frameworks were not directly assessed. Longitudinal and experimental research could provide stronger evidence regarding the directionality of these relationships.

Future studies should also examine the interaction between digital distractibility, attention management strategies, and student outcomes, particularly within special education settings. Comparative studies involving pre-service and in-service teachers may clarify how professional experience shapes vulnerability to distraction. Moreover, experimental and intervention-based approaches—such as digital self-regulation training—could offer practical insights into how teachers can reduce the negative effects of short video use.

This study systematically examined the impact of short video – induced distractibility on teachers—particularly special education teachers—within an integrated framework of Flow Theory, CIUT, and UGT. Findings reveal that short videos compromise teachers' cognitive focus, which in turn undermines classroom management and pedagogical effectiveness. In special education contexts, this threat extends beyond professional performance to the learning rights of the most vulnerable students.

The originality of this study lies in its integration of three theoretical perspectives into a single explanatory model and its application to teacher education. By demonstrating how motivational, compensatory, and gratification mechanisms operate simultaneously, the study frames digital distractibility not merely as an individual habit but as a systemic issue in education.

From a practical standpoint, the findings underscore the need for structured interventions in teacher education and continuous professional development. Unless such strategies are implemented, digital distractibility will continue to pose a systematic risk not only to teachers' competencies but also to students' learning opportunities.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Trakya University (Approval No.: 2025.07.03; Date: 05.08.2025).

Informed Consent: Written informed consent was obtained from the participants who agreed to take part in the study.

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ORIGINAL ARTICLE

Unveiling the Mediating Role of Boredom Proneness in the Relationship Between FoMO and Problematic Smartphone Use among Undergraduates

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Main Points

- Fear of missing out significantly predicts problematic smartphone use among university students.
- Boredom proneness partially mediates the relationship between fear of missing out and problematic smartphone use.
- The findings emphasize the importance of addressing boredom proneness in interventions aimed at reducing problematic smartphone use.
- Intervention programs for university students should focus on managing fear of missing out and developing healthier coping strategies to reduce problematic smartphone use risk.

Abstract

Problematic smartphone use refers to a pattern of behavior that negatively affects individuals' psychological, social, and physical well-being and has therefore become a significant focus of academic research. Individuals engaging in problematic smartphone use often experience withdrawal symptoms when unable to access their smartphones, which can disrupt daily life, academic performance, and social relationships. The development of problematic smartphone use has been linked to several psychological factors, with the fear of missing out emerging as a key predictor. Fear of missing out is conceptualized as an outcome of unmet basic psychological needs, as explained within the framework of Self-Determination Theory. Moreover, previous studies suggest that boredom proneness may also play a role in problematic smartphone use, as individuals prone to boredom tend to use smartphones to seek stimulating or rewarding experiences. Given the adverse consequences of problematic smartphone use, it is crucial to better understand the underlying factors contributing to this behavior. The present study investigated the mediating role of boredom proneness in the relationship between fear of missing out and problematic smartphone use among university students. In this study, these relationships were examined theoretically within the framework of the Person-Emotion-Cognition-Application Interaction model. According to this theoretical perspective, boredom proneness serves as an affective reaction mechanism in the relationship between fear of missing out and problematic smartphone use. A total of 515 university students from a state university participated in this cross-sectional study, completing an online survey via Google Forms. Measures included the Short Boredom Proneness Scale, the Smartphone Addiction Scale – Short Form, and the Fear of Missing Out Scale. Analyses controlled for gender. The mediation pattern held after controlling for gender; female students reported higher problematic smartphone use than males, whereas gender did not predict boredom proneness. The findings revealed that fear of missing out has both a direct and an indirect effect on problematic smartphone use, with boredom proneness serving as a partial mediator in this relationship. These results highlight the importance of targeting both fear of missing out and boredom proneness in intervention and prevention strategies aimed at reducing problematic smartphone use.

Keywords Boredom proneness, FoMO, I-PACE, problematic smartphone use

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Introduction

The trend of digitalization is swiftly accelerating worldwide. Smartphones, being an essential component of contemporary life and regarded as an extension of the self, are pivotal in the digitalization process (Gezgin et al., 2019). We Are Social's February 2025 research indicates that 97.8% of the global population and 96% of individuals in Türkiye utilize smartphones. The pervasive adoption of smartphones is due not only to their function as communication devices but also to the convenience they provide for social interaction, engagement with the opposite sex, information access, entertainment, and the execution of daily tasks. Excessive, problematic, and constant use of smartphones, especially among young individuals, poses specific hazards (Elhai et al., 2017). The primary concern is problematic smartphone use (PSU), which is defined by an inability to regulate smartphone usage and the adverse effects this lack of regulation has on everyday functioning (Fischer-Grote et al., 2019). Problematic smartphone use has emerged as a focal point of academic inquiry in recent years due to its digital behavior pattern, which can result in various adverse outcomes, including impacts on academic performance, social relationships, psychological well-being, and physical health (Paterna et al., 2024; Ru et al., 2025; Soraci et al., 2025).

One of the prominent psychological factors associated with PSU is the fear of missing out (FoMO). Fear of missing out is conceptualized as a pervasive apprehension that others might be having rewarding experiences from which one is absent, and it is defined by a desire to stay continually connected with what others are doing (Przybylski et al., 2013). Within the framework of Self-Determination Theory (SDT), FoMO is regarded as a consequence of unmet fundamental psychological needs, namely autonomy, competence, and relatedness (Ryan & Deci, 2000). As such, individuals experiencing FoMO are more likely to excessively check their smartphones for updates, notifications, or social network sites activity in an attempt to satisfy these needs (Przybylski et al., 2013; Servidio et al., 2021). Numerous studies have indicated a significant positive association between FoMO and PSU (Elhai et al., 2016; Gezgin, 2018; Li et al., 2022; Rozgonjuk et al., 2019), suggesting that FoMO may serve as a critical psychological mechanism underlying excessive and maladaptive smartphone engagement. However, while FoMO has been widely recognized as a direct predictor of PSU, it is equally important to explore the underlying psychological mechanisms through which this association may operate. Prior studies have pointed to various mediating factors such as depression (Liu et al., 2024; Elhai et al., 2016), emotional well-being (Gugushvili, et al., 2020), and anxiety (Elhai et al., 2017) as potential pathways linking FoMO to PSU. Among these, boredom proneness has recently emerged as a particularly salient factor in the digital age, especially among young adults. Therefore, the present study focuses on boredom proneness as a potential mediator to further elucidate the relationship between FoMO and PSU. Consistent with the Interaction of Person-Affect-Cognition-Execution (I-PACE) model (Brand et al., 2019), trait predispositions and affective states are expected to channel motivational tendencies (e.g., FoMO) into specific patterns of problematic technology use, providing a framework for testing potential mediators. Within this model, FoMO functions as a person-related predisposing factor (trait level), whereas boredom proneness represents an

affective response mechanism that mediates maladaptive behavioral outcomes

Boredom is defined as a state of dissatisfaction and discomfort that arises when individuals wish to engage in meaningful or stimulating activities but are unable to do so (Eastwood et al., 2012). Transient episodes of boredom are common and often situational (Chin et al., 2017), emerging from the interaction between personal characteristics and environmental context (Mercer-Lynn et al., 2014). However, beyond state-level boredom, researchers have also focused on boredom proneness, a trait-like tendency to frequently experience boredom, as initially conceptualized by Farmer and Sundberg (1986). While momentary boredom may sometimes lead to adaptive outcomes (e.g., reflection or creativity), boredom proneness has been consistently linked to maladaptive consequences and reduced well-being (Fahlman et al., 2009).

Individuals with high boredom proneness scores are more likely to report being bored across a range of situations (Mercer-Lynn et al., 2014). Previous studies have shown that boredom proneness is associated with various psychosocial problems (Dahlen et al., 2004; Sommers & Vodanovich, 2000; Struk et al., 2017; Tze et al., 2016; Weybright et al., 2015). In the context of technology use, bored individuals often turn to smartphones as a means of escaping this aversive state through activities such as browsing social networking sites (SNSs), messaging, or online gaming (Lin et al., 2009; Skues et al., 2016). Supporting this view, Wolniewicz et al. (2020) identified a significant relationship between boredom proneness and PSU, with FoMO acting as a mediator. Similarly, Zarei (2020) found that both boredom and FoMO mediated the relationship between depressive symptoms and PSU. In another study, Sarıtaş et al. (2024) reported that FoMO positively predicted feelings of boredom, which in turn mediated the relationship between FoMO and social media addiction. Likewise, Duygun et al. (2022) indicated that leisure boredom significantly predicted social media addiction.

Although many of these studies focus specifically on social media, their findings are generalizable to smartphone use more broadly, given that social media addiction is often conceptualized as a subtype of PSU. In this regard, a growing body of empirical research consistently identifies boredom proneness as a key psychological risk factor for PSU (Bozaci, 2020; Elhai et al., 2017; Leung, 2008; Matic et al., 2015; Schroeter et al., 2015; Yang et al., 2020). Therefore, the present study supports the notion that boredom proneness plays a critical role in explaining PSU among young individuals.

These findings collectively suggest a dynamic interplay between FoMO, boredom proneness, and PSU. However, variations in model directionality and the positioning of mediators across existing studies reflect a theoretical inconsistency in the literature. The present study addresses this gap by integrating SDT and the I-PACE model to build a more coherent conceptual framework. From the SDT perspective, FoMO is viewed as a manifestation of unmet basic psychological needs, particularly relatedness and autonomy. Individuals who feel socially disconnected or lack control over their environment may develop persistent anxiety about missing out on rewarding experiences—what has been conceptualized as trait FoMO (Wegmann et al., 2017). This dispositional characteristic can undermine intrinsic motivation and emotional

stability, increasing the likelihood of disengagement and negative affective states such as boredom proneness. Liu et al. (2025) found that frustration of autonomy and relatedness needs significantly predicted heightened levels of boredom in university students. This reinforces the theoretical view that boredom can emerge as a psychological consequence of thwarted basic needs, especially in educational and social environments that fail to satisfy students' motivational drives.

Building on this, the I-PACE model provides an explanatory framework for how these traits and affective states interact to promote maladaptive technology use. In this framework, trait-level FoMO functions as a distal person-related factor, while boredom proneness acts as an affective state that may mediate the pathway from dispositional anxiety to behavioral outcomes like PSU. Unlike previous models that positioned FoMO as a mediator (e.g., between depressive symptoms and PSU), the current study treats trait FoMO as a foundational psychological predisposition, exploring boredom proneness as the affective mechanism that explains its translation into problematic smartphone behavior. This theoretical reframing not only aligns with both SDT and I-PACE but also contributes to the literature by clarifying the directional nature of these psychological processes. Smartphones, in this context, offer an easily accessible coping mechanism—providing immediate, albeit temporary, relief from internal discomfort and perceived social exclusion. Furthermore, as social participation constitutes a key source of meaning and engagement, individuals with high boredom proneness may turn to their smartphones to fill experiential voids, maintain social connectivity, or alleviate emotional discomfort, thereby increasing the risk of PSU (Elhai et al., 2017; Yang et al., 2020; Zhang et al., 2019).

Taken together, this study aimed to examine the mediating role of boredom proneness in the relationship between FoMO and PSU among undergraduate students. Within the I-PACE model framework, trait-level FoMO represents a distal person-related factor, boredom proneness operates as a state-level affective mediator, and PSU emerges as the resulting maladaptive behavioral outcome. Unlike prior studies that often conceptualized FoMO as a situational response or mediating mechanism, this study conceptualizes trait FoMO as a stable dispositional factor, thereby offering a novel perspective on the psychological processes underlying PSU. In line with SDT and I-PACE, FoMO was conceptualized as a trait-level predisposition (X) and boredom proneness as an affective state (M) mediating its relationship with PSU (Y). This theoretical positioning clarifies the directionality of the model and justifies the mediation pathway tested in the present study. Based on theoretical assumptions from SDT and I-PACE, the following hypotheses were formulated:

H₁: FoMO is positively associated with boredom proneness.

H₂: Boredom proneness is positively associated with PSU.

H₃: FoMO is positively associated with PSU after accounting for boredom proneness.

H₄: Boredom proneness mediates the association between FoMO and PSU.

The conceptual model illustrating the hypothesized relationships is presented in Figure 1.

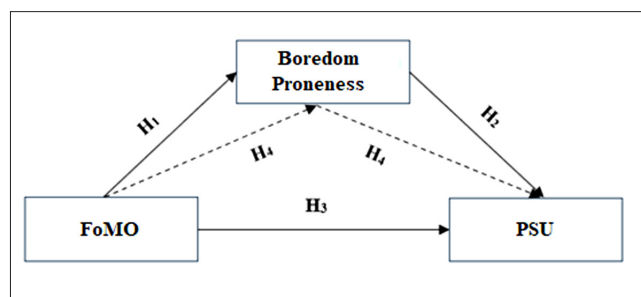


Figure 1. The Proposed Mediation Model. Note: Gender was included as a covariate (coded as 1 = female, 2 = male).

Material and Methods

This research is cross-sectional in design and uses a correlational survey model to reveal the relationships between variables. Cross-sectional studies aim to examine the current situation and relationships between variables at a specific point in time through data collected during that period (Olsen & George, 2004). The correlational survey model, as one of the quantitative research methods, is an approach aimed at identifying relationships and interactions between continuous or ordinal variables (Büyükoztürk et al., 2017). In this context, the relationships between the variables of boredom proneness, FoMO, and PSU were statistically analyzed using the collected data.

Participants

The cross-sectional study was conducted in May 2025. Data were collected via an online survey administered through Google Forms, which was shared on the MS Teams platform. Participants were recruited through a convenience sampling method from students enrolled in a public university in Türkiye, specifically those attending the elective course “Addictions and Prevention of Addictions” at a public university in Türkiye. All participants were active users of the internet and SNSs, with an average daily social network use time of 4 hours and 19 minutes. The final sample consisted of 515 university students, with a mean age of 22.21 years (standard deviation [SD] = 2.65), ranging from 18 to 45 years. Of the participants, 323 (62.7%) were female and 192 (37.3%) were male. The demographic characteristics of the participants are shown in Table 1.

Data Collection Tools

Fear of Missing Out Scale

The Fear of Missing Out Scale (Przybylski et al., 2013) consists of 10 items that assess the FoMO on developments on SNSs. Response options range from “1 = Does not apply to me at all” to “5 = Applies to me completely.” Higher scores indicate that individuals are more prone to the FoMO. “When I go on holiday, I continue to follow what my friends are doing” is one of the sample items from the FoMO Scale. In this study, the Turkish version of the scale (Gökler et al., 2016) was used. The reliability coefficient of the original scale, determined using Cronbach’s alpha coefficient, is 0.95. In the study, the internal consistency coefficient was found to be 0.861.

The smartphone addiction scale - short form

The Smartphone Addiction Scale - Short Form was developed by Kwon et al. (2013) to measure the risk of smartphone addiction and was adapted into Turkish by Noyan et al. (2015). The scale

Table 1.
Demographic Characteristics of the Participants

Variables	Categories	N	%
Gender	Female	323	62.7
	Male	192	37.3
Grade level	1st year	27	5.2
	2nd year	69	13.4
	3rd year	215	41.7
	4th year	197	38.3
	5th year	7	1.4
Department	Mechanical Engineering	63	12.2
	Nursing	55	10.7
	Finance	33	6.4
	Business Administration	26	5.0
	Public Administration	24	4.7
	Turkish Language and Literature	24	4.7
	Health Management	23	4.5
	Sports Management	22	4.3
	Communication and Design	17	3.3
	History	15	2.9
	Electrical and Electronics Engineering	13	2.5
	Genetic ve Bioengineering	13	2.5
	Food Engineering	13	2.5
	Architecture	13	2.5
	English Translation and Interpreting	12	2.3
	Biology	11	2.1
	Audiology	11	2.1
	Nutrition and Dietetics	10	1.9
	Economics	10	1.9
	Landscape Architecture	10	1.9
Others (Chemistry, Mathematics, Econometrics etc.)	97	19.1	
Frequently used SNS app	Instagram	354	68.7
	X	54	10.5
	TikTok	45	8.8
	WhatsApp	31	6.0
	YouTube	31	6.0
Total participants		515	100.0

Note: SNS = Social networking site.

consists of 10 items; each scored on a scale from 1 = Strongly Disagree to 6 = Strongly Agree; an example item is “I delay planned tasks because of smartphone use.” The total score that can be obtained from the scale ranges from 10 to 60. In the reliability study of the scale, the Cronbach’s alpha coefficient was reported as 0.867, and in this study, it was calculated as 0.895.

Short Boredom Proneness Scale

The scale developed by Struk et al. (2017) aims to assess individuals’ levels of boredom proneness and was adapted into Turkish by Güner et al. (2021). The scale consists of eight items rated on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). The total score ranges from 8 to 56, with higher scores indicating a greater tendency toward boredom. An example item from the scale is: “It is difficult for me to entertain myself.” The internal consistency coefficient (Cronbach’s alpha) of the original scale was reported as .91, and it was calculated as .871 in this study.

Data Collection and Analysis

Data collection took place during the last 2 weeks of May in 2025. Participants were informed about the research. The principle of voluntariness was emphasized, and participation was secured through consent forms. The online research forms took approximately 10 – 15 minutes to complete. Prior to the study, ethics committee approval was obtained from Trakya University Social and Human Sciences Research Ethics Committee (Protocol No.: 2022/03, Decision No.: 842989, Decision Date: May 7, 2025).

In the analysis process, descriptive statistics (e.g., mean, standard deviation), normality assumptions, and internal consistency coefficients were calculated. Then, Pearson product-moment correlation analysis was conducted to investigate the relationships between boredom proneness, FoMO and PSU. In addition, skewness and kurtosis values of the variables were calculated to test the normality assumption, and all values were within the acceptable range of -1.5 to $+1.5$ (Tabachnick & Fidell, 2013), indicating no substantial violations of normality. Then, the PROCESS macro (Model 4) for SPSS version 3.4 (SPSS Inc.; Chicago, IL, USA) (Hayes, 2018) was used to analyze the mediating role of boredom proneness in the relationship between FoMO and PSU. The analysis results of the tested mediation model were interpreted using unstandardized and standardized path prediction (β) scores. In order to provide additional evidence for the significance of the direct and indirect effects of the variables in the tested mediation model, Bootstrap analyses were conducted by resampling 10,000 by selecting a 95% CI. In bootstrap analysis, when the CIs do not cover zero, the examined effect is considered to be significant (Hayes, 2018; Preacher & Hayes, 2008). Moreover, gender was used as a covariate in the mediation model to mitigate any confounding effects arising from the disproportionate distribution of male and female individuals in the sample.

Results

Preliminary Analysis

Table 2 presents the descriptive statistics, reliability, and correlation values for the study variables. The mean score for FoMO was 2.53 (SD = 0.80), with skewness of -0.002 and kurtosis of -0.533 . Boredom proneness had a mean of 3.36 (SD = 1.24), with skewness of 0.018 and kurtosis of -0.428 . Problematic smartphone use showed a mean of 3.04 (SD = 1.09), with skewness of 0.325

Table 2.
Descriptive Statistics, Reliabilities and Correlations Among Study Variables ($N = 515$)

Variables	Mean	SD	Skewness	Kurtosis	α	AVE	CR	1	2	3
(1) FoMO	2.53	.800	-.002	-.533	.861	.405	.870	1		
(2) Boredom Proneness	3.36	1.244	.018	-.428	.871	.461	.872	.431**	1	
(3) PSU	3.04	1.088	.325	-.293	.895	.474	.899	.567**	.486**	1

Note: AVE = Average variance extracted (convergent validity); CR = Composite reliability; FoMO = Fear of missing out; PSU = Problematic smartphone use; SD = Standard deviation; α = Cronbach's alpha (internal consistency).

** $p < .001$.

and kurtosis of -0.293 . The skewness and kurtosis values for all variables fall within acceptable ranges, indicating no substantial violations of normality assumptions. Additionally, the Durbin – Watson statistic was calculated as 1.995, suggesting no significant autocorrelation among the residuals. Multicollinearity diagnostics revealed that the Variance Inflation Factor values for all predictors were 1.288, well below the recommended threshold of 10, indicating no multicollinearity concerns. The highest condition index observed was 7.898, which also confirms the absence of multicollinearity problems. Regarding internal consistency, Cronbach's alpha coefficients ranged from .861 to .895, demonstrating high reliability for all study variables (Tabachnick et al., 2013).

The correlation analysis revealed significant, positive, and moderate-level relationships among the study variables. Specifically, FoMO showed a positive and moderate correlation with boredom ($r = .431, p < .01$) and PSU ($r = .567, p < .01$). Similarly, boredom proneness was positively and moderately correlated with PSU ($r = .486, p < .01$). These findings indicate that higher levels of FoMO and boredom proneness are associated with increased levels of PSU.

Mediation Analysis

In this study, a mediation model was conducted to examine the mediating role of boredom proneness in the relationship between FoMO and PSU, while controlling for gender (coded as 1 = female, 2 = male). The findings are presented in Figure 2 and Table 3. Results showed that FoMO had a significant positive effect on boredom proneness ($B = 0.666, SE = 0.06, p < .001; \beta = 0.428$), indicating that increases in FoMO are associated with higher levels of boredom proneness. Gender was not a significant predictor of boredom proneness ($B = -0.037, p = .72$). After including the mediator, FoMO still had a significant direct effect on PSU ($B = 0.568, SE = 0.05, p < .001; \beta = 0.417$). Boredom

proneness also significantly predicted PSU ($B = 0.257, SE = 0.03, p < .001; \beta = 0.294$). In addition, gender significantly predicted PSU ($B = -0.302, SE = 0.08, p < .001; \beta = -0.134$), indicating that female students reported higher PSU scores compared to males. The total effect of FoMO on PSU was significant ($B = 0.739, SE = 0.05, p < .001; \beta = 0.543$). The indirect effect of FoMO on PSU through boredom proneness was also significant ($B = 0.171, BootSE = 0.03, 95\% CI [0.112, 0.241]; \beta = 0.126$), based on 10,000 bootstrap samples. Since the CI did not include zero, the mediation effect was confirmed. These findings support $H_1, H_2, H_3,$ and H_4 , indicating that boredom proneness partially mediates the relationship between FoMO and PSU.

Discussion

This study aimed to investigate the mediating role of boredom proneness in the relationship between FoMO and PSU among Turkish university students. The findings confirmed the fourth and main hypothesis (H_4), indicating that boredom proneness significantly mediates the relationship between FoMO and PSU. This suggests that boredom proneness functions as a key psychological mechanism through which FoMO contributes to PSU. However, the direct effect of FoMO on PSU remained significant even after accounting for boredom proneness, indicating partial mediation. Therefore, while boredom proneness explains a significant portion of the link between FoMO and PSU, other unmeasured mechanisms may also play a role in this association. After controlling for gender, the mediation effect of boredom proneness remained significant, suggesting that the indirect effect of FoMO on PSU through boredom proneness was not confounded by gender. Interestingly, gender significantly predicted PSU, with female students reporting higher levels compared to males, whereas no gender differences were found in boredom proneness. This finding is consistent with previous studies indicating that female students tend to exhibit higher levels of PSU, possibly due to differences in social media engagement patterns.

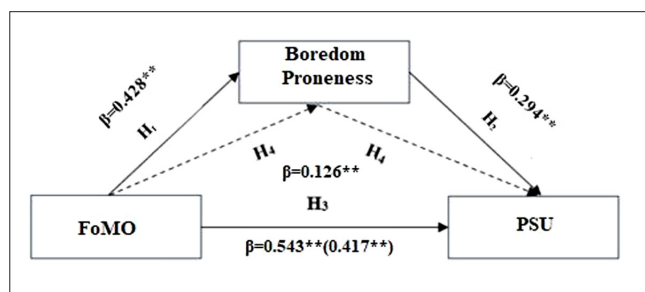


Figure 2. Results of the Mediation Model with Standardized Coefficients (* $p < .01$, ** $p < .001$). Note: Gender was included as a covariate (coded as 1 = female, 2 = male).

The first hypothesis was also supported in the study. Consistent with H_1 , individuals who experience higher levels of FoMO were more likely to report increased feelings of boredom proneness. This may be due to the tension and dissatisfaction associated with unmet psychological needs, such as autonomy and relatedness, as posited by Self-Determination Theory (Ryan & Deci, 2000). A study conducted by Al-Saggaf (2021) revealed that situational phubbing increases as status boredom and status FoMO increase. However, this study addressed situational FoMO and, unlike the current study, defined FoMO as a partial mediator between situational boredom and situational phubbing. Additionally, some studies have suggested that spending a significant amount of

Table 3.

Coefficients for the Mediation Model; Total, Direct and Indirect Effects of Boredom Proneness on Problematic Smartphone Use, and 95% Bootstrap CIs

	Coeff. (B)	SE	t	p	95% CI Lower	95% CI Upper	Std. Coeff. (β)
Mediation Path (X → M)							
Constant (M: Boredom Proneness)	1.7216	0.2376	7.2454	<.001	1.2548	2.1885	–
FoMO → Boredom Proneness	0.6659	0.0630	10.5668	<.001	0.5421	0.7897	0.4281
Gender → Boredom Proneness	-.0374	.1042	-.3593	.7195	-.2421	.1672	-.0146
Outcome Model (X, M, C → Y)							
Constant (Y: PSU)	1.1502	0.1858	6.1904	<.001	0.7852	1.5152	N/A
FoMO → PSU (Direct)	0.5675	0.0518	10.9575	<.001	0.4657	0.6692	0.4172
Boredom Proneness → PSU (Mediator)	0.2570	0.0329	7.8075	<.001	0.1923	0.3216	0.2938
Gender → PSU	-.3020	.0776	-3.8932	<.001	-.4545	-.1496	-.1343
Total Effect (X → Y)							
FoMO → PSU (Total)	0.7386	0.0496	14.8916	<.001	0.6412	0.8360	0.5430
Indirect Effect (X → M → Y)							
FoMO → Boredom Proneness → PSU	0.1711	0.0331	N/A	N/A	0.1117	0.2409	0.1275

Note: Coeff = Unstandardized coefficient; FoMO = Fear of missing out; M = Mediator variables; PSU = Problematic smartphone use; SE = Standard error; X = Independent variable; Y = Dependent variable.

time on SNSs may help reduce distress (Rauch & Schanz, 2013; Stockdale & Coyne, 2020). These findings confirm the relationship between FoMO and boredom proneness through intensive SNSs use. In a study that examined these two variables from different perspectives, it was stated that bored individuals are more likely to think that they missed out on a rewarding experience because they were unable to enjoy themselves cognitively (Holte & Ferraro, 2020). While previous studies have frequently conceptualized FoMO as a mediator between boredom proneness and technology-related behaviors (Al-Saggaf, 2021), the present study adopts a different theoretical approach by positioning FoMO as the independent variable and boredom proneness as the mediator. Grounded in the I-PACE model, this structure reflects the notion that FoMO itself arises from unmet psychological needs and may give rise to emotional states such as boredom proneness. Whereas prior models framed boredom proneness as a precursor to FoMO, this study proposes that individuals with trait FoMO may be more prone to feelings of boredom proneness due to their inability to find satisfaction or meaning in offline activities. This distinction underscores the theoretical nuance of the current model and offers a novel pathway from FoMO to PSU through boredom proneness, thereby contributing to the literature.

The second hypothesis (H₂) was also confirmed, showing that boredom proneness is positively associated with PSU. This supports previous findings suggesting that boredom can prompt individuals to engage in maladaptive digital behaviors in an attempt to escape aversive emotional states (Elhai et al., 2017; Leung, 2008; Yang et al., 2020; Wolniewicz et al., 2020). Supporting this, a study by Lepp et al. (2017) investigated the role of leisure boredom, a concept closely aligned with general boredom tendencies, in a sample of university students. The authors found that higher levels of leisure boredom were associated with more frequent self-reported smartphone use. Although the term refers specifically to

boredom experienced during leisure time, the findings highlight that difficulties in finding satisfying or meaningful leisure activities may contribute to PSU. Furthermore, boredom proneness has been shown to be closely related to sensation-seeking tendencies (Dahlen et al., 2004), which may drive individuals to seek stimulation via digital means such as smartphones. Social participation, often regarded as a fundamental source of meaning in individuals' lives, can be facilitated through smartphone use (Yang et al., 2020). In this light, it is plausible that individuals who struggle to satisfy their psychological needs, such as experiencing a lack of autonomy, relatedness, or engagement, may turn to smartphones to compensate for these deficits.

Lastly, consistent with H₃, FoMO was found to have a significant positive effect on PSU, echoing a substantial body of literature highlighting FoMO as a strong predictor of PSU. This finding is consistent with previous literature identifying FoMO as a strong predictor of PSU (Elhai et al., 2025; Gezgin, 2018; Gezgin et al., 2025; Hussain et al., 2024; Liu et al., 2024). These results may also help explain the widespread use of SNSs among university students, who often express themselves through such online behaviors. As highlighted by Li et al. (2022), when basic psychological needs are not adequately fulfilled in daily life, and the motivation to engage with social networking platforms is strong, individuals may become increasingly vulnerable to heightened levels of FoMO and excessive smartphone use or even PSU. The current findings are consistent with this perspective, further reinforcing the idea that unmet psychological needs may lead individuals to rely on smartphones as a means of self-expression, social connection, and emotional regulation.

In conclusion, this study contributes to research on PSU by demonstrating that boredom proneness acts as a partial mediating mechanism in the relationship between FoMO and PSU. Utilizing

the I-PACE model, this study proposes a new framework for understanding the relationship between FoMO and PSU. The findings indicate that FoMO, conceptualized as a multidimensional construct encompassing both state and trait characteristics (Wegmann et al., 2017), may manifest as PSU in this study through the trait component. According to the I-PACE model, individual predispositions (FoMO) may influence addiction-like behaviors through emotional responses (boredom proneness). Despite its cross-sectional design limiting causal relationships, the results suggest that university students experiencing higher levels of FoMO, and consequently greater boredom proneness, may be more prone to problematic technology usage patterns. The results highlight the importance of developing comprehensive psychoeducational approaches that target not only FoMO but also university students' tendencies toward boredom in intervention and prevention programs for such digital behaviors. Furthermore, future research should include repeat studies using psychometric tools that can measure trait FoMO and test the causal relationships between these variables more robustly using longitudinal research designs, thereby contributing to the strengthening of the theoretical framework.

Limitations

Notwithstanding the valuable contributions of the present study, it is important to acknowledge its limitations. Firstly, the cross-sectional design restricts the ability to infer causality among the variables. Despite the theoretical underpinnings and statistical substantiation of the mediation model, the utilization of longitudinal or experimental designs would be more appropriate for establishing temporal precedence and directionality. Secondly, it is important to note that all data were collected through self-report instruments, which may be susceptible to biases such as social desirability and common method variance. Future research could benefit from incorporating objective behavioral measures or multi-informant approaches to enhance data validity. Thirdly, the study sample comprised just Turkish university students, potentially constraining the generalizability of the findings to other cultural or age demographics. The sample had a greater percentage of female participants (62.7%); nevertheless, gender was statistically controlled as a covariate, so guaranteeing that the observed connections among FoMO, boredom proneness, and PSU were not confounded by gender disparities. To evaluate the model's robustness and cross-cultural applicability, it is advisable to duplicate the study across various populations and contexts. Finally, although the phenomenon of boredom proneness was examined as a potential mediator, other potentially influential psychological constructs, such as impulsivity, difficulties in emotional regulation, or feelings of loneliness, were not included in the model. It is possible that these factors may offer additional explanatory power in future studies.

Data Availability: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethical Approval: Ethical approval for this study was obtained from Trakya University Social and Human Sciences Research Ethics Committee (Protocol No.: 2022/03, Decision No.: 842989, Decision Date: May 7, 2025).

Informed Consent: Written informed consent was obtained from the participants who agreed to take part in the study.

Declaration of Interests: The author has no conflict of interest to declare.

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ORIGINAL ARTICLE

Evaluation of Internet News through a Strategic Communication Document for Combating Addiction

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Main Points

- The analysis of 181 digital news pieces demonstrated that 55.8% had stigmatizing or inadequate language, while 1.1% were in line with the SCDCA, hence signaling a big gap between ethical recommendations and journalistic behavior.
- Of the analyzed content, nearly one-third included explicit labeling and discriminatory expressions, and 17% presented narratives that might normalize or encourage harmful behavior; thus, digital news in Türkiye often amplifies stigma rather than supports communication for recovery.
- These findings highlight the need to make addiction-sensitive journalism and national media literacy programs a priority to reduce stigma, ensure ethical communication, and promote a public health perspective in addiction reporting.

Abstract

This study investigates the influence of addiction-related language in digital news on societal perceptions and stigma. It highlights the crucial role of journalists in Türkiye in reporting addiction with increased accuracy and sensitivity. Using the Strategic Communication Document for Combating Addiction by the Turkish Ministry of Health as a framework, 181 news articles from five leading Turkish news websites—Hürriyet, Milliyet, Habertürk, Sabah, and Sözcü—were analyzed. The results show that 55.8% of the articles used inappropriate language, whereas only 1.1% adhered to the recommended guidelines. This indicates a considerable gap in the effective application of these guidelines. The findings indicate that the media's portrayal of addiction may deter individuals from seeking treatment and that the Strategic Communication Document for Combating Addiction's recommendations have not been effectively incorporated into digital news coverage. Common issues include negative stereotypes about people with addiction, sensationalizing drug-related news, and stressing the economic value of illegal substances. Greater adherence to ethical standards in addiction coverage and comprehensive journalist training programs are essential for promoting ethical and responsible reporting on addiction, reducing stigma, and fighting misinformation. The results reveal a substantial gap between recommended practices and actual reporting, highlighting the need for improved media literacy.

Keywords: Addiction stigma, ethical journalism, media representation, misinformation, public perception, strategic communication

Introduction

The language used to discuss addiction significantly influences societal views, individual self-perception, and treatment outcomes. Stigmatizing terms such as “addict,” “abuser,” and “alcoholic” reinforce societal prejudices, which negatively affect treatment outcomes and people's willingness to seek

help (Atlam & Coskunol, 2022; Barry et al., 2014; Botticelli & Koh, 2016; Broyles et al., 2016; Shi et al., 2022; Zwick et al., 2020).

In the language of addiction, it is essential to use medically precise terms, personalized language, avoid judgmental expressions, and maintain hopefulness about recovery. Documentation and

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communication should adopt respectful language and consistent terminology (Alinsky, 2022; Botticelli & Koh, 2016; Broyles et al., 2016; Zgierska et al., 2020). Furthermore, labels may lead health professionals to develop negative attitudes toward people with substance use disorders, which can hinder health service delivery (Ashford et al., 2019; van Boekel et al., 2013). Additionally, individuals who use substances or alcohol might withdraw from society and treatment due to communication and behavioral patterns that foster self-stigmatization (Şimşek & Ögel, 2023).

Moreover, the societal impact of language of addiction has prompted the publication of various guidelines, such as the International Society of Addiction Journal Editors Statement on Addiction Terminology (2015) and the Recovery Research Institute's (RRI) "Addictionary," which includes over 200 addiction-related terms. There is a "stigma alert" warning in 20 words in this dictionary (RRI, n.d.). There are also two separate resource guides obtained from RRI training materials and published on the Substance Abuse and Mental Health Services Administration website (SAMSHA, 2018a, 2018b). In the article titled "Words Matter - Terms to Use and Avoid When Talking About Addiction," published on the website of the National Institute of Drug Abuse, the terms that should not be used in relation to addiction are shared with appropriate alternatives (National Institute of Drug Abuse, 2021). The common idea in these regulations is that the term person with a substance use disorder should be used instead of the terms junkie, abuser, addict, and whether a substance is detected in urinalysis should be conveyed as x positive or x negative instead of clean or dirty.

News plays a crucial role in informing the public. According to media frame theory, news cannot be presented objectively and impartially. The selection of information in news content, along with the points that are emphasized or not emphasized, creates a new reality. This new reality may lead to many concepts being recreated or misunderstood. News is influenced by many factors, such as the values of media organizations and their employees, market competition pressures, and government policies. The news that results from the interaction of all these variables changes in a way that influences readers' perceptions and attitudes (Le, 2024).

Media frame theory highlights how perceptions of news elements are reflected. However, to better understand how the perceptions and values of media employees develop, it is important to examine the effects of theories rooted in social psychology. Stigma Theory (Goffman, 1963) and Labeling Theory (Becker, 1963) describe how individuals with addiction are socially demeaned when branded as morally flawed or dangerous, with such labels often causing them to internalize deviant identities, which then negatively impact their self-perception, social roles, and access to treatment and social integration. While Stigma and Labeling Theories describe the social devaluation of individuals with addiction, Social Identity Theory (Tajfel & Turner, 1979) and Social Categorization Theory (Fiske et al., 2002) propose that perceptions of different groups can be shaped by the prominence of group identities in the media. Both theories demonstrate how prejudices and social hierarchies are perpetuated through the media by emphasizing distinctions between the general population and those with substance use disorders.

The media is one of the key areas used to spread accurate information about the terms related to addiction to the wider society. Consequently, topics involving addiction and addictive substances are highly newsworthy. Many issues, such as the trade and economic value of illegal substances, the link between criminal organizations and substances, security operations, and deaths following substance use, are of interest to the public (Gezen, 2018).

In addition to the independent initiatives of the Associated Press and Reporting on Addiction in the US, the Mindframe Alcohol and Other Drugs Guideline was developed by the Australian Ministry of Health, and the Strategic Communication Document on Combating Addiction (SCDCA) was published by the Ministry of Health in Türkiye. This effort aims to reduce stigma surrounding alcohol and drug use, encourage individuals who may need treatment or support to seek help, and mitigate potential harm (Associated Press, 2020; Everymind, 2019; Reporting on Addiction, 2022; Sağlık Bakanlığı, 2019).

In Türkiye, the SCDCA, edited by Sağlık Bakanlığı in 2019, was developed to "put forward a sustainable framework that includes the necessary communication strategies and techniques in communication activities to be carried out in order to increase social awareness and consciousness, prevent health risks and social risks, and ensure attitude and behaviour change" regarding addictions. It was stated that, through strategic communication, emphasis will be placed on highlighting that individuals are subjects, not objects, without using discriminatory or labeling language (p.32). In the SCDCA, the content of messages to be used in media tools was evaluated under twenty different headings. It is evident that these titles aim to ensure the expressions used in media tools are not labeling, as well as to promote access to accurate information about treatment and avoid encouraging harmful messages (Sağlık Bakanlığı, 2019). Four of the twenty headings (headings 1, 10, 11, & 20) differ from the other headings in their mode of expression. While the other sixteen headings focus on issues to be avoided, these four contain empowering messages.

Although these guides were initially created for all media, the growth of technology and internet usage has shifted news consumption from traditional to digital platforms, enabled by the widespread availability of mobile devices and workplace computers. (Newman, 2023). Consequently, digital media tools have become a vital data source for assessing addiction-related news.

Addiction news in digital media influences the social aspects of supply, demand, and treatment of addiction. News articles about addiction on five of the most popular news websites in Türkiye were examined according to the twenty headings outlined in SCDCA (Similarweb, 2023). This approach will help identify the practical equivalents of SCDCA's headings and support the development of new suggestions. To date, there has been no evaluation of printed or digital media news content within the scope of SCDCA recommendations. Therefore, this research is expected to offer a unique contribution.

This paper explores how language used in digital media coverage of addiction influences societal perceptions and stigma surrounding substance use disorders. It also aims to determine whether the guidelines and recommendations outlined in

strategic communication documents, such as the SCDCA, are being adhered to in digital media, particularly in addiction-related news reporting. Through this analysis, the paper seeks to provide insights into how the media can help reduce stigma, encourage help-seeking behaviors, and foster a more compassionate and accurate portrayal of addiction.

Material and Methods

This study uses a qualitative research design with directed content analysis, which is well-suited for systematically examining how addiction is portrayed in the media based on predefined categories and for identifying patterns and themes within news content language (Hsieh & Shannon, 2005). This approach concentrates solely on communication language and message delivery, excluding visual content related to news. The method enabled a detailed analysis of how addiction language appears in the chosen news articles. Since three of the twenty titles in the SCDCA (titles 4, 5, and 6) relate to “marginalization, discrimination and reputation,” these were evaluated by the researchers under the category of “labeling.”

This research consisted of articles published by five of the most widely visited online news outlets in Türkiye: Hürriyet, Milliyet, Habertürk, Sabah, and Sözcü (Similarweb, 2023). These outlets were selected because of their large audience reach and their influence on shaping public opinion. Additionally, their editorial positioning (centrist, pro-government, opposition, tabloid) was considered to capture a broad ideological and stylistic diversity within Turkish digital media. The data was collected by scanning the news on the main screen of these five popular news websites at 10:00 a.m. every day from September 27, 2023, to May 21, 2024. Although the SCDCA was published in 2019, this time frame was chosen to fill a gap in the literature by observing how the principles of the SCDCA are reflected in recent digital news content in Türkiye.

As a result of the scanning conducted by the researchers between the specified dates, 181 news items about addiction were collected. In non-probability samples, researchers may determine that saturation has been reached when no new information or themes are observed. Based on this, data collection was halted by mutual agreement of the researchers after 181 news items, as no further information could be obtained (Guest et al., 2006). This was regarded as evidence that the data saturation in the qualitative research had been achieved. These news items were stored together with the news texts and links. When the data collection process was finished, the news articles were assessed by both researchers in terms of headlines in the SCDCA - Content of Messages section. Although no formal inter-coder reliability coefficient was calculated, both researchers independently coded the data, compared their results, and resolved discrepancies through discussion until full consensus was reached.

Results

As presented in Table 1, approximately 56.9% ($n = 103$) of the news items matched the content specified in the guidelines. Other news items were excluded from the targeted content analysis because they did not match the content. Some of the news items matching the content in the SCDCA may fall under more than one theme.

Table 1.
Evaluation of News According to the Content in Strategic Communication Document for Combating Addiction

	Yes		No		News That Does Not Match the Content	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Compatible with the content in the SCDCA	2	1.1	101	55.8	78	43.1

Note: SCDCA = Strategic Communication Document for Combating Addiction.

As shown in Table 2, the news content aligns with 16 of the headlines in the SCDCA. News items do not match four titles (10, 11, 13, and 15). Considering the challenge of finding content related to positive messages in news coverage, the absence of matches for headlines with empowering explanations, such as 10 (highlighting treatment options) and 11 (presenting success stories), is understandable within the framework of digital news, which tends to favor more sensational content. Additionally, it is important to note the need to consider SCDCA headings 4, 5, and 6 collectively. Due to the difficulty in distinguishing these three items from each other, they were grouped under the label “labeling.” This theme was recurring (30%) and often featured stigmatizing phrases such as “addict,” “junkie,” and references linking individuals to crime and violence. Furthermore, 17.37% of the news was identified as encouraging misbehavior by providing explicit or sensational details regarding substance use methods, particularly in crime reports. Another significant finding is that 11.05% of the content mainly focused on the tabloid aspect of addiction, frequently highlighting celebrity drug scandals or sensational crime headlines. These trends indicate a persistent tendency within Turkish online news platforms to prioritize stigmatizing, criminalizing, and sensational narratives over health-oriented, informative, or rights-based reporting on addiction.

1. The risk of addiction is possible for everyone in society.

Murray has identified the situation as a public health crisis, particularly highlighting the alarming levels of drug use in Glasgow, Scotland, which the British Government must address to prevent further harm (Sabah, October 4, 2023).

2. The fleeting and illusory feeling of well-being caused by addiction should not be overstated.

In a recent incident in Beyoğlu, Istanbul, authorities confiscated two kilograms and 697 grams of cannabis during a police raid. The individual in custody, Ş.T., claimed that he used the drug because it was said to relieve a toothache (Hürriyet, November 6, 2023).

In another instance, during a trial, the defendant, Hüseyin P., commented on the heating properties of “Bonzai,” a synthetic drug, to the presiding judge, prompting a laugh in the courtroom (Sözcü, January 11, 2024).

3. Adjectives or language that promote the normalization of drug, tobacco, and excessive technology use should be avoided.

Table 2.
News Matching Content in Strategic Communication Document for Combating Addiction

Themes	n	%
1. The risk of addiction is possible for everyone in society.*	1	0.53
2. The temporary and illusory sense of well-being induced by addiction should not be emphasized.	4	2.1
3. Adjectives or language that normalize the use of drugs, tobacco, and excessive technology should be avoided.	2	1.05
4. The reputation of addicts should not be harmed.	57	30
5. Addicts should not be marginalized		
6. Addicts should not be subjected to discrimination.		
7. Generalizations that target specific individuals and institutions should be avoided.	11	5.79
8. Exaggerated expressions should be avoided	12	6.32
9. Providing unnecessary information should not result in wrong behavior.	33	17.37
10. Messages on how young people can resist and resist negative attitudes, expectations or peer demands should be included.*	0	0
11. The treatment process should be accurately explained *	0	0
12. Care should be taken not to give encouraging and intriguing implicit messages in visual, written or audio media messages.	7	3.68
13. Addiction should not be portrayed as a normalized or glamorized aspect of popular culture.	0	0
14. Addictive substances should not be normalized.	9	4.74
15. Addictive substances should not be romanticized.	0	0
16. The market value of addictive substances should be excluded	14	7.37
17. Techniques for combating addictive substances should not be disclosed.	2	1.05
18. The lifestyles of drug traffickers should not be promoted.	16	8.42
19. Sensational and tabloid-style coverage of addiction should be avoided, as it undermines the gravity of the issue and hinders a sensitive, thoughtful approach to addressing it.	21	11.05
20. Success stories should be incorporated. *	1	0.53
Total	190	100

*Headings containing empowering statements.

The candy, which contains psychoactive substances, is labeled with the government warning “not intended for use by people under 21 years of age,” and the packaging also notes that the product has not been approved by the FDA. In Jamaica, regulations introduced in 2015 classify the possession of up to 57 grams of cannabis by individuals over the age of 18 as a “misdemeanor.” (Sözcü, October 3, 2023).

6 kilograms of cocaine were stolen from the courthouse safe ... Everyone knew the officer was a smoker! (Hürriyet, Mynet, March 19, 2024).

4. The reputation of addicts should not be damaged.

E.A1*, who has a history of substance addiction, reportedly killed two cats and assaulted his mother and siblings when they intervened to stop him from attacking his 10-year-old son (Hürriyet, January 26, 2024).

S.D*, the elder sister of businessperson D.P.1*, was detained after admitting to drug use live on social media. (Hürriyet, October 1, 2023).

During a raid on singer K.'s1* home, 15 grams of skunk were seized. Singer K.1* said she was not a dealer but a user.

5. Addicts should not be marginalized.

Relatives of individuals imprisoned for drug-related offenses have expressed relief at their imprisonment, citing the harm caused to the family and environment. One parent stated, “We begged and pleaded with him to stay away from drugs, but he would not listen. Would a parent be happy that their child is in prison? In our case, we are happy because it has brought some relief to our lives.” This sentiment reflects the complex emotions families experience when dealing with addiction and its consequences (Milliyet, April 11, 2024).

6. Addicts should not face discrimination.

Law enforcement authorities carried out a raid at a workplace in Bursa’s Woodworking Small Industrial Site, detaining three foreign nationals suspected of involvement in drug trafficking (Sözcü, April 15, 2024).

Like a zombie film: The difficult situation of drug-addicted homeless individuals in the United States has attracted international attention, raising concerns in other countries. A journalist remarked, “We should pray that this doesn’t happen here,” while emphasizing the impact of drug use on urban areas in the US (Sabah October 4, 2023)

7. Avoid generalizations that focus on specific individuals and institutions.

“Police Cannot Enter”: A social media personality, identified as M.Ö., known for creating content about “Türkiye’s dangerous and inaccessible neighborhoods,” published a video featuring the Tatlıcak* Neighborhood on his social media account. During subsequent searches conducted by law enforcement, authorities seized 190 drug pills, 166 grams of heroin (in two separate packages), a cannabis plant, 25 grams of marijuana, two unlicensed pistols, one precision scale allegedly used for drug trafficking, and three shotguns (Mynet, October 9, 2023).

Rap music, in certain subgenres, is often linked to themes such as drug use, gang violence, and the promotion of a philosophy that justifies extreme behaviors as a way of escaping poverty. These themes may include depictions of violence, firearm use, objectification of women, and a skewed view of sexuality (Sabah, April 7, 2024).

8. Exaggerated expressions should be avoided.

The drama of a family destroyed by drugs: Save us from my brother. He set the house on fire and watched. Opening the window and shouting “I’m going to eat cat meat,” Altan killed two cats fed by the family and, with a porcelain plate in his hand, threw them from the third floor to the street. (Hürriyet, January 26, 2024).

When I didn’t give him money, he would give me an example of the child who cut off his mother’s head and say, “I will cut off your head.” One day again, he used violence until he broke my mouth and nose. I went to the police station, and they told me to go to a shelter. Then I went to the prosecutor’s office; I showed my bruises, and the next day they came and took me from the house. If he had not gone to prison, he would have killed me or someone else (Milliyet, April 11, 2024).

9. Providing unnecessary information should not lead to wrongful behavior.

WE USED OTHERS’ IDENTIFICATION INFORMATION! I was shown how to prescribe medication using the “my prescription” system by S.1* He mentioned that many doctors are unfamiliar with this application and offered to demonstrate it to them when prescribing medication. I accompanied M.1* and O.1* to different hospitals, where I prescribed medication using the ID numbers that MK.1* sent via WhatsApp (Sabah, November 19, 2023).

PLASTIC BOTTLE AND DRUGS FOUND ON HIM! The detained individual was identified as the person featured in social media images using drugs with a plastic bottle on a moving tram. He was charged with “possession and use of drugs” but was subsequently released from police custody (Hürriyet, March 5, 2024).

A “national emergency” was declared due to the emergence of a drug known as “kush.” This drug is prepared by combining several chemical substances with ground human bones to enhance its effects (Sözcü, April 5, 2024).

They were found to be involved in the separation and multiplication of cocaine impregnated in fertilizer in vineyard houses (Milliyet, Mynet, Sözcü, April 11, 2024).

12. Care should be taken not to send encouraging and intriguing implicit messages through visual, written, or audio media.

Location: Istanbul – An individual, referred to as “Pikachu,” was apprehended in the forest under suspicious circumstances (Milliyet, Mynet, April 13, 2024).

A drug operation resembling the tactics seen in films was carried out in Istanbul (Sözcü, April 11, 2024).

14. Addictive substances must not be normalized.

28 grams of bonzai (Sabah, April 8, 2024), 23 units of ecstasy (Hürriyet, October 3, 2023)

N.F.C.1*, associated with Cranberry Sorbet, was reported to have had phone conversations with a drug dealer. During one conversation, she mentioned her intention to try drugs for the first time. Another conversation involved a discussion about price fluctuations, with N.F.C. suggesting that the old price be maintained for the day. He used expressions indicating the types of drugs such as “1.5 T, half L, taxi” (Sabah, May 15, 2024).

16. The market value of addictive substances ought to be excluded.

A record seizure of 8 billion Turkish lira worth of illegal commercial goods and drugs was reported by the Ministry of Trade. This achievement resulted from successful operations carried out by the Customs Enforcement units in the first 3 months of 2024, marking an increase of approximately 300% compared to the same period in the previous year (Sabah, Sözcü, April 18, 2024).

In Spain, a \$686 million cannabis trafficking gang has been dismantled, according to a statement by the Spanish National Police. It was found that the gang, which was involved in a \$686 million cannabis fraud, had established a marketing system (Milliyet, April 13, 2024).

17. Techniques for combating addictive substances must not be disclosed.

In a social media post about the operation, Minister of Trade Ömer Bolat announced that a methamphetamine-type drug, with an estimated market value of around 500 million TL, was seized. The drug was attempting to be smuggled into the country hidden within a 1-ton cotton load (Mynet, October 4, 2023).

Police officers from the Sultanbeyli District Security Directorate identified an unusual swelling on the ground in a wooded area during a surveillance drone flight (Sabah, April 13, 2024).

18. The lifestyles of drug traffickers should not be promoted.

The transition from shopkeeper to mafia boss: “K.1* had no assets in the past and made his living as a shopkeeper. Today, his wealth has surpassed what I can count. His involvement in the drug trade marked the beginning of his rise to power” (Hürriyet, February 26, 2024).

Drug smugglers were apprehended following a shootout, during which large amounts of foreign currency and Turkish lira were seized. Two luxury cars, found in the garden and used by the smugglers, were impounded and taken to the police parking lot (Hürriyet, March 17, 2024).

19. Sensational and tabloid-style coverage of addiction should be avoided, as it diminishes the seriousness of the issue and hampers a sensitive, thoughtful approach to addressing it.

S.D.1*, the elder sister of businessperson and social media influencer D.P., admitted to using cocaine during a live broadcast on her social media account (Habertürk, Hürriyet, Sözcü, October 1, 2023).

He remarked, “Bonzai warms you up well, Mr. President,” to the presiding judge, which provoked laughter in the courtroom (Sözcü, January 11, 2024).

20. Success stories ought to be incorporated.

A.G.1*, a contestant on *Who Wants to Be a Millionaire* hosted by Kenan İmirzalıoğlu, shared her personal story with the audience, revealing that her three children were placed in a Child Protection Institution. During the competition, she discussed her experiences with substance abuse, stating, “The disease of our age is substance abuse, which affected our family like a lightning strike. I became a drug addict myself, but I eventually quit.” Gündüz, now working at the Bursa Association for Combating Drugs, expressed her pride in helping thirteen individuals recover from addiction. She concluded by saying, “Life passes in one way or another, but the most important thing is how you look at life” (Mynet, October 9, 2023).

Results

In total, 181 addiction-related news articles published on five major Turkish online news sites were analyzed in accordance with the 20 thematic headings of the Strategic Communication Document for Combating Addiction (SCDCA). The findings revealed that 55.8% (n = 101) of the articles used inappropriate or stigmatizing language, while only 1.1% (n = 2) fully adhered to the ethical and linguistic guidelines of the SCDCA.

A full 30% of the news contained stigmatizing or labeling expressions like “addict,” “junkie,” or phrases that associate users with crime and violence. Moreover, 17.37% of the news items contained explicit or sensational information that may promote misbehavior, especially crime news. About 11.05% were tabloid-oriented, focusing on celebrities with drug scandals or sensationalizing addiction-based events.

The analysis also showed that empowering and health-oriented messages recommended by the SCDCA were almost entirely absent. None of the reviewed articles contained content under Headings 10, 11, 13, or 15 — which emphasize treatment processes, positive resistance among youth, and the avoidance of normalization or romanticization of addiction. Instead, a significant portion of news stories emphasized criminality, tragedy, and the market value of illegal substances (7.37%), reflecting a tendency to frame addiction primarily as a law enforcement issue rather than a public health matter. Overall, the results of

the present study clearly show that there is a gap between the principles of the SCDCA and real journalistic practices in digital news media, with stigmatizing, sensational, and criminalizing narratives dominating Turkish online reporting about addiction.

Discussion

In this study, addiction-related news published on Turkish online news sites was evaluated in accordance with the 20 headlines of the SCDCA. When the results from this study are compared with those in the literature, it becomes evident that the tendency to use sensational language is not limited to Türkiye. A study conducted by Sunderland et al. (2023), examining 2007 news stories about alcohol and other drugs in Australia found that 38% of the news stories used sensationalist language, 22% used influencer language, and only 1% provided information to seek help. Similarly, it was McGinty et al. (2019) reported that 49% of media coverage during the opioid epidemic in the United States involved stigmatizing language. The findings of this study are consistent with international literature.

The findings also support the claims made by Sağlık Bakanlığı (2019) when developing the SCDCA. Notably, most news content consists of material that fosters stigma, emphasizes the criminal nature of addiction, and lacks solution-oriented messages. The frequent use of stigmatizing terms like “addict” and the association of individuals with crime and violence in 30% of the news content illustrate the mechanisms described in Stigma Theory (Goffman, 1963), where people with substance use disorders are socially devalued and marginalized, reinforcing societal prejudices and limiting their access to treatment and social integration. Additionally, consistent with Labeling Theory (Becker, 1963), the tendency to label individuals using negative language and framing crime not only influences social attitudes but also contributes to the internalization of these attitudes by affected individuals, thereby hindering their help-seeking behavior and reintegration into society.

Another notable aspect of the findings is the prevalence of tabloid-style news stories that emphasize the tragic and sensational elements of addiction. These results align with Media Framing Theory (Le, 2024), which suggests that the way addiction is presented in media content is shaped by editorial values, market competition, and audience expectations, ultimately creating a reality that favors sensationalism over public health-focused narratives. Furthermore, the fact that the analyzed news items lacked content on resilience to negative behaviors or treatment options indicates that media outlets tend to avoid this aspect of addiction-related news.

This tendency reinforces the social categorization processes outlined by Social Identity Theory (Tajfel & Turner, 1979) and the Stereotype Content Model (Fiske et al., 2002), aiding in the exclusion of substance users from mainstream social groups and bolstering “us versus them” distinctions in public discourse.

In Türkiye, addiction-related content is mainly shown through crime and tabloid news. Particularly, phrases like “the person found dead in his apartment with a syringe in his arm,” “the family who destroyed the house while searching for drugs,” and “the person who killed his mother because she did not give him money

for drugs” illustrate this trend. These examples again show the media’s focus on individual tragedy, criminality, and moral decline, rather than public health issues or recovery options. This study’s findings support previous research and highlight that, despite existing national and international ethical guidelines on addiction reporting, there are notable shortcomings in media practices.

Based on the findings, it is recommended that collaborations with media organizations take place to develop journalist training programs focused on addiction-sensitive reporting, establish addiction-specific ethical reporting guidelines, and incorporate nationwide media literacy initiatives into public education campaigns to reduce stigma, misinformation, and promote help-seeking behaviors.

Limitations and Directions for Future Research

This study uses a limited sample that examines news articles from the most popular internet news sites within a specific timeframe.

Assessing both the news articles and the accompanying images in line with SCDCA will improve the understanding of the overall message conveyed by the news. It would be advantageous to gather scientific data covering broader time periods while comparing traditional media tools, internet news sites, and social media platforms.

One limitation of this study is the use of the term “addict” in line with the language adopted in the SCDCA framework. While this terminology was maintained to ensure consistency with the official categories, it is acknowledged that the term is considered stigmatizing in current addiction literature. Future studies should prefer person-first and non-stigmatizing language to align with ethical guidelines and reduce unintended bias.

Future research could expand on this analysis by exploring how addiction is portrayed across social media platforms, traditional broadcast media, and influencer-driven content. Comparative studies between digital news media, social media, and influencer posts would provide valuable insights into the wider media environment shaping public perceptions of addiction.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: This study was exempt from ethical review as it exclusively analyzed documents and data available in the public domain, with no involvement of human subjects.

Informed Consent: As the study does not involve human participants, informed consent was not applicable for this study. This research was based on the content analysis of publicly available documents, such as news articles.

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ORIGINAL ARTICLE

Impact of Workplace Stress on Addictive Behaviors among Workers in a Tunisian Petroleum Industry

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Main Points

The main points of this study are:

- Focus on occupational stress: The study investigates the relationship between occupational stress and health-related behaviors, specifically smoking, alcohol consumption, and caffeine intake, among Tunisian onshore oil workers using validated tools.
- Addictive behaviors linked to stress: The findings reveal that low social support is significantly associated with smoking behaviors (OR = 2.65), suggesting that psychosocial factors play a crucial role in how workers cope with stress.
- Call for interventions: The research underscores the need for targeted workplace interventions aimed at reducing occupational stress and promoting healthier behaviors to improve overall worker well-being and productivity in the Tunisian oil sector.

Abstract

Occupational stress is one of the major health hazards of the modern workplace. It has been linked to a poor mental health and increased rates of addictive behaviors on and off the job. This remains relatively unexamined, especially in the Tunisian working environment, where it is the first time that this specific issue is being studied. The objective was to investigate and explore the correlation amid occupational stress, health-related behaviors of smoking/alcohol usage, and caffeine consumption among Tunisian onshore oil workers. A cross-sectional survey was conducted among 94 onshore oil installation workers of a Tunisian private oil company over a period of 6 months from January to June 2018. They were investigated with a self-administered questionnaire about sociodemographic characteristics and health-related behaviors. Workplace stress was evaluated with job content questionnaire. Smoking dependence was assessed via the Fagerström score and the motivation to quit by Richmond test. Alcohol consumption was measured by the questionnaire of fast alcohol consumption evaluation. Data were analyzed using SPSS and $p < .05$ was considered statistically significant. This cross-sectional study included exclusively male workers with an average age of 41.17 years. The majority of employees were married (72.6%). Almost the half had a high level of education. An average of professional seniority was about 14.03 years. Of 94 workers, 33 (35.1%) were current smokers and 18 (18.9%) were current drinkers. The average caffeine consumption was 277.22 ± 153.638 mg/day. Job strain and iso-strain were respectively noted in 48.9% and 27.7%. The statistical analysis indicated that current smoking was significantly associated with low social support with an OR = 2.65 (95% CI [1.034 – 6.802]). The findings indicate that a substantial proportion of workers experience high levels of job strain and iso-strain, with 48.9% and 27.7%, respectively. These conditions are known to contribute to adverse health outcomes, including mental health issues and increased addictive behaviors. The significant association between low social support and current smoking (OR = 2.65) underscores the role of psychosocial factors in addictive behaviors. This aligns with existing literature that suggests individuals under stress may resort to smoking as a coping mechanism, reflecting a broader trend observed in various occupational settings. The prevalence of smoking (35.1%) and alcohol consumption (18.9%) among the participants is concerning, particularly given the high-stress environment of the oil industry. These behaviors not only pose direct health risks but

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can also impair job performance and safety. These data provide evidence that petroleum workers are exposed to a monotonous lifestyle in the workplace, leading to high psychosocial risks. In response to varying levels of stress, employees may adopt different addictive behaviors. All above mentioned factors can directly or indirectly threaten the workers' health and work productivity.

Keywords: Addictions to alcohol, addictions to tobacco, occupational stress, onshore oil workers, social support

Introduction

Work is essential to the existence because it allows us to satisfy the deepest needs for achievement, creation, and purpose. Taking part in a rewarding job has a positive impact on the general well-being. However, occupations that restrict people's capacity to use their brains, creativity, and decision-making abilities can cause a great deal of stress. Individual variables and job expectations interact to cause work-related stress, which alters a person's psychological and/or physiological state (Richardson & Rothstein, 2008). Research has shown that psychological hazards and stress at work have a negative impact on workers' health, safety, and well-being, as well as the performance of the company as a whole (Stansfeld & Candy, 2006). An association between work-related stress and physical and mental health problems has been repeatedly demonstrated by numerous studies (Choy & Wong, 2017; Desouky & Allam, 2017; Jodier, 2018; Quick & Henderson, 2016; Tripathi et al., 2018; Zare et al., 2017). The American Institute of Stress claims that one of the main causes of the larger mental health epidemic is workplace stress. People are frequently exposed to ongoing pressures at work, which can increase their vulnerability to addictive behaviors (Sinha & Jastreboff, 2013). These behaviors may serve as coping strategies but can raise long-term health risks (Conway et al., 1981; Murphy et al., 1999; Ragland et al., 2000; Schmidt et al., 2010). Examples of these behaviors include smoking, excessive caffeine use, and alcohol usage. Greater absenteeism and presenteeism rates, strained labor relations, lower employee motivation and satisfaction, less creativity, and greater turnover rates are all consequences of these problems in the workplace (Elstad & Vabo, 2008; Heo et al., 2015). When taken as a whole, these issues have a substantial influence on productivity and cost businesses money directly and indirectly, which eventually lowers their ability to compete in the market.

Working conditions for petroleum workers are difficult, especially in the Tunisian desert where the study is conducted. Workers here face isolation and harsh weather, including storms, hot summers, and cold winters (Jiang et al., 2017; Jiang et al., 2018). Working in the field while living in staff dorms causes them to be away from their families for extended periods of time, which can have a negative psychological impact and result in feelings of loneliness, anxiety, and despair (Shaygan & Yazdanpanah, 2019). Furthermore, this workforce frequently leads to unhealthy lifestyles that include smoking, excessive alcohol use, irregular eating patterns, and other harmful activities (Chen et al., 2008; Li et al., 2016).

Onshore and offshore work environments in the oil and gas sector differ greatly, which has an impact on mental and physical health in distinct ways. Compared to their offshore colleagues, onshore employees frequently feel more pressured at work and think their jobs are more repetitious (Bergh et al., 2018). Furthermore, differences in how these two groups view their jobs and health have been observed according to the type of job (Bjerkan, 2011).

To the best of knowledge, no studies have specifically addressed this issue among onshore Tunisians. This study, which intends to investigate the connection between occupational stress and addictive behaviors among workers in an onshore oil field in Tunisia, was motivated by this gap in the literature.

Material and Methods

Population and Study Design

This study was a cross-sectional analysis conducted from January 1 to June 30, 2018. Participants were employees of an onshore oil production firm in the desert of Tunisia. Employees had to have worked for at least a year and adhere to a regular schedule of two weeks on the platforms and two weeks off at home in order to be eligible. Of the 200 employees polled during their onshore rotation, 94 completed the survey, yielding a 47% response rate. The company manager was briefed on the purpose of the survey and the data collection methods prior to the start of data collection. Either conventional paper-and-pencil techniques or a secure web-based questionnaire system were used to gather data. Participants received comprehensive information regarding their rights, the purpose of the study, and the safeguards in place to protect their privacy and data. The Ethics Committee of Sfax University Faculty of Medicine granted ethical approval for this study (Approval no: 24/25, Date: 25/03/2025). Informed consent was obtained from the participants who agreed to take part in the study.

Research Instruments

Sociodemographics

The questionnaire's first portion asked questions intended to collect sociodemographic data about the study population, including marital status, educational attainment, and work-related traits.

Addictive Behaviors

Using a self-reporting technique, addictive behaviors such as smoking, drinking alcohol, and consuming tea and coffee were evaluated.

* "Do you smoke?" was the inquiry used to gauge smoking behavior. The question had three possible answers: 1 for current smokers (those who routinely smoke at least one cigarette a day and have done so for at least a year), 2 for never, and 3 for ex-smokers (those who have quit smoking for a year or more). The Fagerström test for nicotine dependence (FTND), a recognized and reliable tool for determining the degree of physical nicotine addiction, was then used to evaluate nicotine dependence in smokers (Etter et al., 1999). It includes six measures that assess cigarette usage, dependence, and urge to consume. The FTND is assessed using a range of 0 to 1 for yes/no items and 0 to 3 for multiple-choice items. A total score of 0 – 10 is obtained by adding up all of the items. The degree of the patient's physical nicotine dependence increases with the total Fagerström score. The European Psychiatric Association recently advised using

it in routine therapeutic practice (Rüther et al., 2014). The person’s readiness to change and motivation to stop smoking were assessed using the Richmond exam (Richmond et al., 1993). It is a 4-item test used to assess smoking cessation motivation. The overall score is in the range of 0 to 10. Low motivation is indicated by a score of 0 – 4, moderate motivation by a score of 5 – 6, and great motivation to quit by a score of 7 – 10.

* The yes-or-no question, “Do you drink?” was used to gauge drinking habits. There were three options: 1 for current drinker (having routinely consumed alcohol at least once a week for at least a year), 2 for never, and 3 for ex-drinker (having abstained from alcohol for at least a year). The fast alcohol consumption evaluation (FACE) questionnaire, which consists of five questions, was used to analyze drinkers’ alcohol intake over the course of the previous 12 months. For French general practitioners, it is a suitable screening tool and a valid questionnaire (Dewost et al., 2006). The overall score is in the range of 0 to 12. Scores below 5 for men suggest minimal or no risk, scores between 5 and 8 indicate heavy alcohol use, and scores above 8 indicate alcohol dependency.

*Intake of coffee, tea, and caffeine was determined by asking participants to indicate how much coffee and tea they typically drank during the previous 12 months. The average consumption of tea (50 mg/cup) and coffee (100 mg/cup) was used to estimate daily caffeine intake (Bracken et al., 2003).

Workplace Stress Evaluation

Karasek’s job demand-control model served as the foundation for potential psychological risk factors (Karasek Jr, 1979). The self-administered Karasek questionnaire (version 26 items) is a tool used to assess the psychological and social aspects of employment. The high demand/low control/low support model of job strain development is measured using the following scales: (a) decision latitude related to the dimensional control; (b) psychological demands; and (c) social support. The main tenet of the concept is that jobs that are associated with high job demands and limited job control will experience the highest levels of stress (Karasek et al., 1998). Two conditions can be distinguished: “iso-strain,” which is job strain combined with exposure to low social support at work, and “job strain,” which is the mismatch between high psychological demands and limited choice freedom. Multiple-choice questions were completed by the subject, who received scores ranging from 1 (strongly disagree) to 4 (strongly agree).

Statistical Analysis

SPSS for Windows version 20.0 (IBM SPSS Corp.; Armonk, NY, USA) was used for statistical analysis. The sample’s demographic and occupational features, as well as its addictive behaviors (average intake of tea and coffee, smoking, and drinking habits), were evaluated using descriptive statistics. Differences in these factors between workers with Karasek summary scores were compared using the chi-square or Fisher’s exact test. The statistical association between two continuous variables (total caffeine consumption and Karasek’s model scales) was assessed using Pearson’s correlation. The mean scores of the Karasek model with nicotine dependence (which is classified as a binary variable, with moderate to high dependence coded as 1 and no to low dependence coded as 0) were compared using the student’s *t*-test. The threshold for statistical significance was *p* < .05.

Results

Sociodemographic Characteristics of subjects

The sample consisted of 94 petroleum workers with a mean age of 41.17 (SD = 9.6) years, with a range of 27 to 63. The population was exclusively male, with an average professional seniority of 14.03 (SD = 10.6) years and a range of 1 – 38. Other sample sociodemographic characteristics are presented in Table 1.

Descriptive Analysis of Smoking, Alcohol Consumption, and Coffee/Tea Average Intake

Of 94 workers, 33 (35.1%) were current smokers, and 25 (26.6%) were ex-smokers. Almost half (48.5%) of smokers had a moderate to high nicotine dependence. According to the Richmond test, half of the population intended to quit smoking, and 25% of active smokers had a good motivation to quit. There were 18 (19.1%) current drinkers and 11 (11.7%) ex-drinkers. Coffee and tea consumption were noted in 83 (88.3%) and 71(75.5%) respectively. The average caffeine consumption was 277.22 (SD = 153.638) mg/day, ranging from 50 to 750 mg/day. More details are given in Table 2.

Occupational Stress Variables in the Petroleum Workers According to Karasek’s Model

Situations of “job strain” and “iso-strain” were respectively noted in 48.9% and 27.7%. More details of this model are presented in Table 3.

Association between Occupational Stress and Addictive Behaviors

The statistical analysis indicated that current smoking was significantly associated with low social support with an OR = 2.65 (95% CI [1.034 – 6.802]). A statistically significant association was found between moderate to high nicotine dependence and job strain (OR = 5.41 (95% CI [1.19 – 24.52])). There were no statistically significant differences among other variables, which

Table 1.
Demographic Characteristics among Onshore Oil Workers

Demographic Characteristics	n (%)
Marital status	
Single	21 (22.3)
Married	71 (75.5)
Divorced	2 (2.1)
Widowed	0
Children	
Yes	64 (68.1)
No	9 (9.6)
Parents in charge	
Yes	41 (43.6)
No	53 (56.4)
Education level	
Primary school	11 (11.7)
High school	24 (25.5)
University	59 (62.8)
Job type	
Labor	20 (21.3)
Supervisor	42 (44.7)
Senior supervisor	32 (34)

Table 2.
Addictive Behaviors among Petroleum Workers

Addictive Behaviors	n (%)	Addictive Behaviors	n (%)
Do you smoke?		Do you drink coffee?	
Never smokers	36 (38.3)	Yes	83 (88.3)
Ex-smokers	25 (26.6)	No	11 (11.7)
Current smokers	33 (35.1)	Number of cups/day	
		1	27 (32.5)
		2	29 (34.9)
		≥3	27 (32.5)
FTND's score		Do you drink tea?	
1 – 2 = no dependence	7 (21.2)	Yes	71 (75.5)
3 – 4 = low dependence	10 (30.3)	No	23 (24.5)
5 – 6 = moderate dependence	9 (27.3)	Number of cups/day	
7 – 10 = high dependence	7 (21.2)	1	40 (56.3)
		2	15 (21.1)
		≥3	16 (22.5)
Richmond test's score		Total caffeine consumption(mg/day)	
0 – 4 = low motivation	14 (42.4)	[1 – 150]	27 (30)
5 – 6 = moderate motivation	7 (21.2)	[151 – 300]	35 (38.9)
7 – 10 = high motivation	12 (36.4)	>300	28 (31.1)
Do you drink?		FACE's scores	
Never drinkers	65 (69.1)	<5 = low or no risk	11 (61.1)
Ex-drinkers	11 (11.7)	5 – 8 = excessive alcohol Consumption	4 (22.2)
Current drinkers	18 (19.1)	>8 = alcohol dependence	3 (16.7)

Table 3.
Psychosocial Risks According to Karasek's Model

Karasek's Variables	n (%)
High psychological demand	
Yes	60 (63.8)
No	34 (36.2)
Low decision latitude	
Yes	77 (81.9)
No	17 (18.1)
Low social support	
Yes	58 (61.7)
No	36 (38.8)
Job strain	
Yes	46 (48.9)
No	48 (51.1)
Iso-strain	
Yes	26 (27.7)
No	68 (72.3)

included alcohol consumption and coffee/tea average intake ($p > .05$) (Table 4). No significant association was observed between caffeine consumption and Karasek's scores.

Discussion

The current study looked into how Tunisian onshore workers' addictive behaviors were affected by workplace stress. The study offered empirical support for the impact of mental health on petroleum workers, despite the low response rate of 47%. Comparison of the sample's sociodemographic characteristics with those of the non-respondents revealed similarity with the general population in terms of age, sex, marital status,

educational attainment, and professional seniority. Conclusions about the representativeness of the data in the sample were significantly reinforced by these findings.

The results show a robust correlation between occupational stress and nicotine dependency. The effects of stress at work on tobacco addiction have been the subject of numerous studies. According to Hassani S. et al. (Hassani et al., 2014), there was a strong correlation between the prevalence of smoking and the demand domain of occupational stress, which included job control, workload, and work pace. Furthermore, Radi et al. discovered that smoking among men was linked to increased job strain after adjusting for age, education, marital status, and antagonistic behaviors (Radi et al., 2007). This is probably caused by a variety of psychosocial hazards at work, such as inclement weather, loud noises, exposure to crude oil, excessive workloads, and shift-related sleep disturbances. In order to meet their performance targets, they frequently put in extra hours and miss out on leisure activities. There is evidence that stress can lead to smoking, and all of these factors may play a significant role in burnout (Goeders & Guerin, 1994). The study's findings showed that current smoking was significantly correlated with low social support, which is consistent with a review that examined the relationship between psychosocial stress at work and risky health behaviors. The review emphasized that smoking is a complex phenomenon that is influenced by psychosocial factors like social support and occupational stress (Siegrist & Rodel, 2006). In actuality, desert petroleum workers spend weeks at a time working in distant areas, which means they are separated from friends and family—two crucial support networks whose absence can affect well-being and create feelings of loneliness.

The results of this study show a statistically significant correlation between employees' workplace stress and moderate to high levels of

Table 4.*Association between Occupational Stress and Addictive Behaviors Presented by Odds Ratio (OR) and 95% CIs*

Karasek's Variables	Current Smoking	Current Drinking	Tea Consumption	Coffee Consumption
High psychological demand	0.66 (0.27~1.58)	0.89 (0.36~2.21)	0.54 (0.19~1.54)	0.62 (0.15~2.54)
Low decision latitude	0.99 (0.33~2.97)	1.56 (0.46~5.28)	0.93 (0.27~3.22)	0.41 (0.05~3.51)
Low social support	2.65 (1.03~6.80)*	1.98 (0.76~5.14)	1.33 (0.51~3.46)	3.25 (0.88~12.06)
Job strain	0.6 (0.28~1.56)	0.96 (0.40~2.31)	0.52 (0.20~1.37)	0.50 (0.13~1.86)
Iso-strain	1.22 (0.47~3.11)	0.99 (0.37~2.64)	0.83 (0.29~2.34)	1.02 (0.24~4.19)

nicotine dependency. According to earlier studies, smoking is a common coping strategy used by people who are under stress at work. They utilize nicotine to reduce tension and anxiety related to their workplace. Research has indicated that workers in stressful jobs are more likely to smoke to cope with their stress (Son et al., 2016).

There was no correlation between drinking alcohol and stress at work. It's interesting to note that this link was not found in the majority of cross-sectional research (Siegrist & Rodell, 2006). One potential explanation is that alcohol use is forbidden during the onshore work cycle, which can persuade employees to give up alcohol. Another explanation is that significant individual differences in the propensity to increase or decrease habitual substance use in response to different stress levels may be the cause. Additionally, it is common for people to underreport their alcohol use (Boniface et al., 2014). In contrast to the present findings, a meta-analysis of 142,140 participants found that heavy drinkers are more likely than moderate drinkers to suffer stress at work (Heikkila et al., 2012).

Caffeine use and stress did not significantly correlate, according to a number of earlier studies (Conway et al., 1981; Rios et al., 2013). The results also support the conclusions of the investigation. The finding could be explained by the fact that different individuals react differently to stress. These findings demonstrate that petroleum employees face significant psychosocial hazards due to their exposure to a repetitive work environment. Employees may engage in various addictive behaviors in reaction to differing stress levels. All of the aforementioned elements have the potential to directly or indirectly endanger the productivity and well-being of employees. Therefore, in order to support health and well-being in the workplace, interventions to modify addictive behaviors must be planned and carried out. Stress management approaches may also be utilized to reduce absenteeism.

Limitations and Directions/Suggestions for Future Research

This study has a number of limitations even if it offers insightful information. First, the cross-sectional design of the study makes it difficult to determine a direct link between addictive behaviors and work-related stress. Longitudinal designs should be explored in future studies to gain a deeper understanding of these changes over time.

Furthermore, using self-administered questionnaires could lead to biases such as social desirability bias, in which individuals over-report positive traits or underreport unhealthy habits. Including objective measurements could improve the data's validity.

Although the study concentrated on alcohol, coffee, and smoking, it did not look at other possible addictive habits or health-related problems. Future studies might examine a greater variety of health-related habits and how they interact.

These limitations should be addressed in future studies by using longitudinal techniques and larger, more varied populations.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

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Informed Consent: Informed consent was obtained from the participants who agreed to take part in the study.

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REVIEW

A Roadmap to Problematic Pornography Use: Research, Assessment, and Treatment

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Main Points

- Conceptualization and measurement: Problematic pornography use remains positioned at the intersection of addiction, impulse control, and compulsive behavior models. However, no consensus has been reached, and there is a need for standardized diagnostic criteria and culturally valid, psychometrically robust instruments aligned with International Statistical Classification of Diseases, Eleventh Revision.
- Methodological limitations: Current research relies heavily on university and online self-selected samples, limiting representativeness and generalizability across national and cultural contexts. More inclusive, longitudinal, and mixed-method studies are needed.
- Risk and protective factors: Traits such as impulsivity, insecure attachment, and early exposure often serve as risk factors, while family functioning, social support, and religious or ethical commitments emerge as protective factors. Integrating both risk and resilience into developmental and cultural models is essential.
- Effects and content differences: Problematic pornography use is associated with psychological distress, sexual dysfunction, relationship difficulties, and aggressive attitudes. However, these effects are heterogeneous and often shaped by gender, sexual orientation, usage context, and cultural background. Most studies neglect the role of content type (e.g., violent vs. nonviolent, amateur vs. romantic) in shaping outcomes.
- Interventions and future directions: Cognitive behavioral therapy, acceptance and commitment therapy, mindfulness-based programs, pharmacological treatments, and online self-help tools show promising results. Yet, evidence is limited by small, male-dominated samples, short follow-up periods, and reliance on self-report. More rigorous, long-term, and diverse intervention studies are required.

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ABSTRACT

Problematic pornography use has gained increasing scholarly and clinical attention over the past decade. Despite this, definitions remain contested, classification models are inconsistent, and measurement approaches vary, creating barriers for cumulative knowledge and evidence-based practice. This review provides an overview of the conceptual, methodological, and clinical landscape of problematic pornography use. The goal is to guide researchers and practitioners by summarizing current knowledge, identifying research gaps, and highlighting future directions. A narrative review of the literature was conducted, synthesizing theoretical models, epidemiological findings, measurement tools, identified risk and protective factors, and available intervention approaches. Special attention was given to cultural variation, usage characteristics, and the role of moral incongruence. Findings indicate that problematic pornography use is situated at the intersection of behavioral addictions, impulse-control difficulties, and compulsive tendencies, with no consensus on a unifying framework. Prevalence estimates vary widely due to sampling bias and definitional inconsistencies. Risk factors include impulsivity, insecure attachment, and early exposure, while protective factors such as family support and ethical disapproval may buffer risk. Excessive pornography use has been linked to psychological distress, relationship difficulties, and aggressive sexual attitudes, though associations are moderated by contextual variables. Measurement remains inconsistent, with few tools aligned with diagnostic criteria. Interventions such as cognitive behavioral therapy, acceptance and commitment therapy, mindfulness, and pharmacological options show promise, but evidence is limited by small samples and short follow-ups. Future research should prioritize standardized definitions, culturally adapted measurement, inclusion of content-type variables, and methodologically rigorous longitudinal designs. Clinical efforts must expand to diverse populations and relational contexts, moving the field toward an empirically grounded and ethically responsible science of problematic pornography use.

Keywords: Addictions to technology, pornography research, Problematic pornography use

Introduction

Pornography is one of the most widely consumed digital media formats, driven by technological advancements and internet accessibility (Peter & Valkenburg, 2016). Beyond entertainment, it operates as a multibillion-dollar industry that shapes sexual norms and expectations (Altman & Watson, 2019; Dines, 2010; Tarrant, 2016). The digital era has expanded on-demand access and user-generated content, transforming production and consumption patterns (Naghdechi et al., 2022).

Emerging technologies, such as virtual reality and artificial intelligence, are further reshaping pornography consumption, making it more personalized and interactive (Marshall & Miller, 2019). This evolution has intensified research on its effects on individuals and society (Sinković et al., 2013; Zatonni et al., 2020).

While these developments deepen users' relationships with pornography, they also trigger problematic usage behavior in some individuals. An increasing number of individuals report compulsive use leading to psychological distress (Camilleri et al., 2021; Maddock et al., 2019), relationship dissatisfaction (Willoughby & Dover, 2024), and cognitive dissonance based on moral incongruence (Lewczuk et al., 2020). Early exposure, especially in adolescence, is associated with unrealistic sexual expectations and risk-taking behaviors (Adarsh & Sahoo, 2023).

Despite growing concerns, problematic pornography use (PPU) is not classified as a distinct disorder in DSM-5 but is recognized under compulsive sexual behavior disorder (CSBD) in the International Classification of Diseases, Eleventh Edition (ICD-11), which defines it as an inability to control sexual urges, causing distress and functional impairment.

In sum, in modern societies—and particularly within Western cultural contexts—pornography has evolved into an ordinary, normalized component of daily life. As technology moves toward an era shaped by artificial intelligence and virtual or augmented reality, pornography occupies

As technology moves toward an era shaped by artificial intelligence and virtual or augmented reality, the topic continues to be a focal point in public health and developmental psychology—particularly regarding young people's perceptions of their bodies, relationships, and sexual scripts—the clinical implications of problematic use extend to both theoretical (e.g., classification systems, research methodologies) and practical (e.g., effects, antecedents and consequences, treatment strategies) levels.

At this point, there is a clear need for a comprehensive and integrative overview of this field. This review aims to serve as a roadmap for researchers and clinicians seeking to understand and address PPU. Specifically, it outlines key issues related to the definition, classification, prevalence, psychological and relational impacts, assessment tools, and intervention strategies associated with PPU, drawing on interdisciplinary perspectives and the most recent empirical findings.

Methods

This narrative review is based on literature searches conducted in PubMed, PsycINFO, Web of Science, Scopus, and Google Scholar between 2018 and 2024. English-language articles published within the past 5 years were prioritized. The main search terms included “problematic pornography use,” “compulsive sexual behavior disorder,” “pornography addiction,” “hypersexual behavior,” “sexual compulsivity,” “sexual addiction,” “sexually explicit material,” and “cybersex addiction.” However, classical or seminal papers were also included when relevant, based on the authors' expertise, to provide a historical perspective on the conceptualization and development of PPU.

Results and Discussion

The results are organized into six main sections: Conceptual framework of PPU, prevalence, measuring PPU, prevalence, risk, and protective factors, effects of PPU, treatment approaches for PPU, and protective and preventive interventions. Each section includes several subtopics that integrate theoretical, empirical, and clinical perspectives from the reviewed literature.

Conceptual Framework of Problematic Pornography Use

Defining Pornography: A Persistent Challenge

Defining pornography remains a key challenge in this research area, with terms such as sexual visual stimuli, erotica, and sexually explicit media used interchangeably (Vaillancourt-Morel et al., 2019). The internet's vast and diverse content makes it difficult to reach a unified consensus on its definitions (De Alarcón et al., 2019; Kohut et al., 2020).

Furthermore, the definition of pornography varies among individuals (Hald et al., 2014; Willoughby & Busby, 2016), and the literature highlights the ongoing definitional difficulties (Busby et al., 2020; Kohut et al., 2020; McKee et al., 2020). In a panel study, social scientists defined pornography as "obscene material intended to arouse sexually," while humanities scholars framed it as a "structure" and "process" shaped by power dynamics (McKee et al., 2020). Recently, Kohut et al. (2020, p. 12) proposed a comprehensive conceptual definition that captures the multifaceted nature of pornography:

"Pornography use is a common but stigmatized behavior, in which one or more people intentionally expose themselves to representations of nudity which may or may not include depictions of sexual behavior, or who seek out, create, modify, exchange, or store such materials."

Classification of Problematic Pornography Use

The classification of PPU remains a subject of debate, with different frameworks suggesting links to hypersexuality (Kafka, 2010; Reid et al., 2011), addiction (Delmonico, 1997; Griffiths, 2012; Kor et al., 2013; Potenza, 2017; Young, 1998, 2004), obsessive-compulsive disorder (Cooper et al., 2004), and impulse control disorders (Kraus et al., 2018). However, although some scholars associated PPU with the notions outlined above, early scholars relied on quantitative studies and associated PPU with the frequency of usage. For example, according to a previous study, individuals spending more than 11 hours per week on pornography (Cooper et al., 1999) or experiencing more than seven orgasms per week (Kafka, 2010) were considered problematic. Despite this finding, later studies have highlighted that the frequency alone may not be a significant indicator of PPU. Instead, the subjective sense of loss of control and its functional impairments have become central to determining PPU, which distinguishes between non-problematic low/high-frequency use and problematic high-frequency use (Böthe et al., 2020).

First classification attempt was made in 2010 by Martin P. Kafka, for the inclusion of out-of-control sexual behavior, named Hypersexual Disorder for DSM-5, emphasizes recurrent and excessive sexual urges or behaviors leading to distress and significant impairments (Kafka, 2010). However, the DSM-5 committee ultimately rejected the proposal, citing concerns over forensic misuse and insufficient empirical support (Reid & Kafka, 2014). Despite ongoing classification efforts, PPU is not currently recognized as an independent disorder in either the DSM or ICD. One of the primary reasons for this is the limited number of empirical studies specifically addressing PPU (Ince et al., 2021). Furthermore, to formalize the classification of compulsive sexual behaviors, the World Health Organization introduced CSBD in

ICD-11. According to ICD-11, CSBD is categorized under impulse control disorders and includes a wide range of behaviors associated with sexual behaviors such as masturbation, cybersex, and pornography use. Nevertheless, CSBD is categorized under impulse control disorders in the ICD-11; some researchers argue that it exhibits more compulsive than impulsive characteristics (Lew-Starowicz & Coleman, 2022). Despite this controversy, according to ICD-11, CSBD is defined by a persistent loss of control, functional impairment, and repeated unsuccessful attempts to reduce the frequency or intensity of compulsive sexual behaviors (Kraus et al., 2018). Given that pornography use is one of the most prevalent symptoms of CSBD, which is observed in approximately 80% of cases (Kafka, 2014; Wordecha et al., 2018), recent studies have conceptualized PPU within the context of CSBD. Based on this classification, PPU can be defined as repetitive and uncontrollable pornography use that leads to unsuccessful attempts to reduce pornography use, resulting in significant functional impairments in various domains, including academic, professional, and interpersonal areas. Furthermore, ongoing debates regarding the classification of CSBD persist, which are also addressed below.

Impulse Control Disorder Model

Impulse control disorders are characterized by a persistent inability to resist urges for short-term gratification, despite long-term negative consequences. Although CSBD is not classified strictly under impulse control disorders in ICD-11, it shares common features, such as impulsivity and diminished capacity to evaluate consequences. For example, excessive pornography consumption that impairs social or physical functioning is often cited as illustrative of such dysregulation (Gola & Potenza, 2018).

Impulsive-Compulsive Spectrum Model

Although CSBD is classified as an impulse control disorder in the ICD-11, its impulsive or compulsive nature remains debated. Impulsive behaviors are reward-driven, whereas compulsive behaviors develop as habitual responses to avoid harm. This distinction highlights the differences in the underlying mechanisms (Böthe et al., 2022). Furthermore, the addiction process has been proposed at the beginning as more impulsive in nature and later to become more compulsive, emphasizing its transitive nature (Brand et al., 2016). However, despite this proposed transition, some researchers have linked CSBD more strongly to impulsivity (Böthe et al., 2019), while others have associated it with compulsivity (Sassover & Weinstein, 2020).

Obsessive-Compulsive Spectrum Model

In the Obsessive-Compulsive Spectrum Model, the compulsivity component refers to repetitive behaviors aimed at avoiding negative consequences, while impulsivity is driven by the pursuit of immediate gratification. This distinction complicates the classification of CSBD and PPU within the spectrum (Kraus et al., 2018). Moreover, according to the ICD-11, such behaviors are more habitual and obligatory than pleasure-driven behaviors. Coleman's Impulsive/Compulsive Sexual Behavior Model suggests that these behaviors often have both impulsive and compulsive components (Coleman, 2018). For PPU to be considered compulsive, it typically involves rigid routines and strict patterns, such as watching pornography at the same time and in the same way, indicating habitual behavior (Antons & Brand, 2021).

Addiction Model

Addiction is traditionally defined as dopaminergic activation in the ventral reward pathways, leading to tolerance and withdrawal. However, research has shown that certain behaviors, independent of substance use, can trigger similar neurobiological changes, leading to the recognition of behavioral addictions (Olsen, 2022). Reflecting this, the DSM-5 classified gambling disorder under the substance-related and addictive disorders section and listed internet gaming disorder as a condition requiring further study to be recognized as a distinct condition (American Psychiatric Association, 2022). In contrast, ICD-11 (2018) classified gaming disorder as a behavioral addiction alongside gambling disorder. In ICD-11, gambling disorder, gaming disorder, and CSBD share several common components, including a loss of control, the continuation of behavior despite negative consequences, centrality in life (salience), and impairment in functionality.

According to this model, emotional distress plays a crucial role in the development of CSBD (Goodman, 1993). Sexual addiction theory further links CSBD to a “wounded sense of self,” suggesting compulsive sexual behaviors serve as coping mechanisms for psychological distress (Bóthe et al., 2022; Goodman, 1993) and regulation for negative emotions (Khantzian, 1997). The theory incorporates elements such as cognitive biases, mind preoccupation, triggers, and rituals into this cycle. Traditionally, this conceptualization has been defined by characteristics such as disorganized attachment styles, concomitant mood disorders, family structure with a history of addiction, and childhood trauma (e.g., abuse, neglect, or sexual abuse) (Bóthe et al., 2022). Recent research supports this framework, emphasizing insecure attachment and emotion regulation difficulties playing a significant role in the development of CSBD. Kotera and Rhodes (2019) found that anxious attachment mediates the link between childhood trauma, narcissism, and sex addiction, suggesting that attachment-related distress is a key factor in the development of CSBD. Similarly, Wizła and Lewczuk (2024) demonstrated that difficulties in emotion regulation mediate the relationship between insecure attachment and both CSBD and PPU, reinforcing the role of emotional dysregulation in compulsive sexual behaviors.

Unlike gambling and gaming, pornography addiction lacks clear empirical foundation. Hilton and Watts (2011) argue that PPU shares neurological and symptomatic similarities with other addictions, particularly affecting the mesolimbic system (responsible for reward, motivation, pleasure, and emotional regulation). Research has also shown increased Δ FosB protein production in pornography users, similar to substance addictions (Hilton & Watts, 2011). Sensitization studies have further indicated that brain regions activated in cocaine users when exposed to drug-related cues are also activated by erotic imagery (Phillips et al., 2015). However, methodological limitations and a lack of comprehensive empirical studies prevent classification of PPU as a behavioral addiction in ICD-11 (Bóthe et al., 2022, World Health Organization, 2018).

Beyond these perspectives, alternative models provide different approaches. For instance, the Dual-Control Model (Janssen & Bancroft, 2007) suggests an imbalance between excitatory and inhibitory systems, which may contribute to sexual dysfunctions and pathological behaviors. On the other hand, the

Non-Pathological Model (Bóthe et al., 2022; Vigorito & Braun-Harvey, 2017) argues that sexual behaviors are part of natural individual differences and excessive sexual activity may not be inherently pathological. These alternative models offer valuable insights that complement and sometimes challenge previously established theories.

Measuring Problematic Pornography Use

Measuring Quantity of Pornography Use

Although the quantitative aspect of pornography use was initially considered the primary indicator of PPU, over time it has become clear that relying solely on usage duration or frequency presents a significant limitation. This is because frequency of use may not necessarily predict PPU (Bóthe, Tóth-Király, et al., 2020). However, the quantitative aspect of use is still being questioned as an important variable in almost every research study. Among these studies, viewing duration was measured as weekly hours or minutes (Baranowski et al., 2019; Gola et al., 2016; Mennig et al., 2022), while recent studies favor session-based duration reporting (Bóthe et al., 2018). Pornography use frequency is frequently categorized as follows: never, once in the past year, 2–6 times, 7–11 times, monthly, 2–3 times a month, weekly, 2–3 times a week, 4–5 times a week, 6–7 times a week, and more than 7 times a week (Bóthe et al., 2020).

Widely Used Problematic Pornography Use Scales Worldwide

Over 20 different scales have been developed to assess PPU, utilizing various theoretical models. Some rely on Griffiths’ addiction model (Griffiths, 2005), others on the DSM-5 obsessive-compulsive disorder criteria (Compulsive Pornography Consumption Scale, Cyberporn Compulsivity Scale; APA, 2022) or Kafka’s hypersexuality criteria (Pornography Consumption Inventory; Kafka, 2010). Additionally, some scales focus on negative effects (Pornography Consumption Effect Scale, PCE-SF, PCE-R) or self-regulation deficits (Deficient Self-Regulation Scale, Habit Strength Scale, Negative Consequences Scale). However, many of these tools lack a strong theoretical grounding (Bóthe et al., 2018).

A systematic review by Fernandez and Griffiths (2021) highlighted that only two scales fully encompass the addiction dimensions (Griffiths, 2005). First, PPU Scale (Kor et al., 2014)—evaluates distress, functional impairment, excessive use, and control difficulties. Moreover, second, Problematic Pornography Consumption Scale (PPCS; Bóthe et al., 2018) includes salience, mood modification, conflict, tolerance, relapse, and withdrawal. Moreover, supporting their assumptions, a meta-analysis of 17 studies on PPCS reported an internal consistency of .91 (Demirgöl et al., 2024). The PPCS is unique in explicitly measuring both quantitative and qualitative tolerance, making it a widely accepted scale to measure PPU (Bóthe et al., 2018, 2023; Fernandez & Griffiths, 2021).

Scales Assessing Perceived Effects, Motivations, and Moral Disapproval

Some instruments do not directly measure PPU but instead focus on related constructs such as perceived effects, motivations, or moral disapproval—each of which represents a widely studied aspect of pornography use. Pornography Consumption Effect Scale (Hald & Malamuth, 2008) measures perceived

positive and negative effects of pornography use. Pornography Use Motivations Scale (Bóthe et al., 2021) measures eight motivations for pornography use, including sexual curiosity, pleasure, stress relief, and self-exploration. Pornography Craving Questionnaire (Kraus & Rosenberg, 2014) assesses craving, control difficulties, psychophysiological reactions, and emotional changes related to pornography consumption.

Moral disapproval is an essential factor that influences perceived PPU. Studies suggest that individuals may subjectively perceive their pornography use as problematic due to moral beliefs rather than actual consumption patterns (Grubbs et al., 2015). Moral Disapproval Scales (Grubbs et al., 2015; Volk et al., 2016) measure moral incongruence in pornography use. The Pornography Moral Disapproval Scale (Dinçer & Eksi, 2024) was developed to assess general moral attitudes toward pornography, particularly in religious populations, while intentionally excluding explicit religious language or framing.

These validated scales provide a multidimensional approach to studying pornography use, helping researchers assess problematic behaviors, motivations, psychological effects, and moral influences comprehensively.

Prevalence, Risk, and Protective Factors

Prevalence of Problematic Pornography Use

The epidemiology of PPU varies across studies due to differences in measurement methods, which range from validated scales to single, researcher-generated item assessments. An additional concern is the limited use of nationally representative samples in PPU research, which limits the generalizability of these findings.

Problematic pornography use has been increasingly recognized in recent literature and is often considered a common behavioral manifestation of CSBD (Kraus et al., 2018). In this context, the lifetime prevalence of CSBD among psychiatric inpatients, estimated at 4% to 5% (Jha & Banerjee, 2022), underscores the clinical significance of PPU. Furthermore, the rates of self-identified pornography addiction have been reported to range from 1% to 11% across studies (Grubbs et al., 2020). Although nationally representative studies are limited, their estimates of PPU prevalence suggest rates between 1% and 3% among women and between 4% and 11% among men (Grubbs et al., 2019; Grubbs et al., 2022; Rissel et al., 2017) indicating greater prevalence among men. Cross-cultural data collected from 42 countries revealed a prevalence of PPU ranging from 3.2% to 16%, with the highest rates reported in Taiwan, China, Malaysia, Türkiye, and Brazil respectively (Bóthe, Nagy et al., 2024).

Risk Factors

Identifying risk and protective factors for PPU informs evidence-based prevention and intervention strategies. A review of systematic reviews, meta-analyses, artificial intelligence (AI)-based studies, and comprehensive theses highlights key PPU risk factors (Bóthe et al., 2024; Chen, 2022; Dinçer, 2022; Grubbs et al., 2020; Seyedzadeh Dalooiy, Aghamohammadian Sharbaaf, et al., 2023)

Particularly, Bóthe et al. (2024) conducted an AI-supported meta-analysis with 112,397 individuals from 74 datasets across 16 countries. Using a random forest imputation algorithm, they

ranked risk factors based on their impact from highest to lowest, providing a structured classification of PPU risk determinants. Results are presented in Table 1.

The literature was reviewed, and the risk factors for PPU were categorized. However, some perspectives suggest that sexual desire is the most significant influence on pornography use and that including it as a variable may render other influences negligible (Binnie & Reavey, 2020). For instance, a recent meta-analysis of 51 studies involving 45,808 individuals identified sexual compulsivity as the most significant correlation of internet pornography use (Akbari et al., 2024). It should be emphasized that this effect is particularly significant when considered within the context of impulse control disorders. Nevertheless, the categorized presentation of the above table is expected to contribute to the literature.

Protective Factors

While most research has focused on the risk factors that cause PPU, protective factors that reduce the likelihood of PPU have also been examined. Religious commitment, spirituality, family functioning, social competence, self-esteem, self-control, social relationships, and school commitment were among the most effective protective factors against PPU. For example, religious practices and spiritual commitment contributed to more conservative attitudes and social norms toward pornography use (Hardy et al., 2013; Ma et al., 2017). Similarly, strong family ties and positive social relationships, characterized by emotional support, were associated with lower levels of PPU (Doornwaard et al., 2015; Mesch, 2009). These findings suggest that the promotion of protective factors may increase the effectiveness of interventions to reduce PPU. Results are presented in Table 2.

Effects of Problematic Pornography Use

Problematic pornography use has been associated with diverse negative outcomes across developmental, relational, and clinical domains. These effects may manifest as aggression, distorted sexual perceptions, relationship difficulties, mental health issues, and neurological changes (Wright et al., 2016; Bóthe et al., 2018). The effects vary depending on the frequency, content type, and socio-cultural context (Chen et al., 2021; Rowland & Uribe, 2020). On the other hand, it has been suggested that the true effects of internet pornography can only be revealed by completely eliminating its use (Wilson, 2016).

Mental Health and Psychological Well-Being

Problematic pornography use is linked to several negative mental health issues, including sexual problems, addiction-like behaviors, depression, anxiety, and social difficulties. A major factor is the loss of control over use, often leading to guilt, shame, or regret, which can worsen psychological distress. (Bóthe et al., 2018, Wéry & Billieux, 2017).

Some individuals use pornography to cope with negative emotions like stress, boredom, or loneliness. Over time, this can lead to compulsive use that disrupts daily life, affecting work, school, and relationships. Frequent engagement may also lower self-esteem, increasing social withdrawal and emotional isolation (Brand et al., 2016, Grubbs et al., 2015).

Table 1.
Categorized Risk Factors for Problematic Pornography Use

Categories	Risk Factors*
Sociodemographic risk factors	Male gender
	Young adults
	Loneliness
	Early onset of pornography use
	Lower religiosity
	Higher socioeconomic status
Personality characteristics	Non-heterosexual sexual orientation
	Impulsivity/lack of perseverance
	High sensation-seeking/novelty-seeking
	Pornography use to relieve distress
	Low self-control
	Low self-esteem
	Maladaptive coping strategies
	High neuroticism
Negative emotions	Proneness to boredom
	Emotional avoidance as pornography uses motivation
	Sexual shame
	Emotional dysregulation (difficulty in managing emotions)
	Stress reduction as pornography use motivation
Associated mental disorders	Guilty
	Stress reduction as pornography use motivation
	Anxiety symptoms
	Depressive symptoms
	ADHD
	Internet addiction
	Problematic gaming behavior
Borderline personality disorders	
Pornography use characteristics	Paraphilic disorders
	Substance use disorders
	More frequent pornography use
Pornography use characteristics	Moral incongruence toward pornography use
	Excessive time spent on pornography (session duration)

*Risk factors are ranked according to the literature, from the highest to the lowest impact value.

However, the link between PPU and mental health is complex and not always straightforward. Research suggests that factors like loneliness, anxiety, and low self-esteem often play a role.

Current studies also have limitations, such as using samples that are mostly male, heterosexual, and from Western cultures. Future research should include more diverse participants to provide a clearer and more sensitive understanding of the issue (Vieira & Griffiths, 2024).

Neurological Effects of Problematic Pornography Use

Problematic pornography use is associated with changes in the brain structures involved in reward processing, impulse control, and self-regulation. These include reduced striatal volume, impaired prefrontal-limbic connectivity, and increased tolerance to sexual stimuli (Kühn & Gallinat, 2014; Schmidt et al., 2017). Attention biases toward erotic stimuli mirror patterns observed in substance addiction (Wang et al., 2022; Golec et al., 2021), with findings pointing to sensitization, hypofrontality, and HPA axis dysregulation (Banca et al., 2016; Simsarian et al., 2023). In women, pornography use has been linked to increased activation in Brodmann area 45, which is potentially related to empathy circuits (Cuesta et al., 2020), while adolescents show heightened vulnerability due to underdeveloped emotional regulation (Faisal et al., 2022). However, causality remains unclear, emphasizing the need for longitudinal studies.

Relational Effects

Problematic pornography use has been consistently associated with a range of adverse relational and sexual outcomes, though these associations are shaped by contextual factors such as frequency, secrecy, and partner alignment. Studies indicate that PPU—particularly when hidden from one's partner or perceived as excessive—can undermine relational satisfaction by eroding trust and intimacy, often leading to emotional distancing or conflict (Koletic & Vlahov, 2025; Vaillancourt-Morel et al., 2020). Gender-specific patterns have also emerged: while frequent solitary use among men is linked to reduced sexual desire and satisfaction, women's pornography use tends to be associated with increased sexual interest and partnered activity (Kohut et al., 2021; Wright & Tokunaga, 2025).

On the sexual functioning side, high-frequency use (e.g., 3+ times per week) has been linked to erectile difficulties, dissatisfaction with one's sex life, and reduced ability to engage in desired sexual behaviors (Malki et al., 2021). Event-level research also shows that solitary use on days of partnered sex may predict heightened sexual distress in partners (Vaillancourt-Morel et al., 2021). While the COVID-19 pandemic saw a spike in pornography consumption, there is no conclusive evidence suggesting that this led to a parallel increase in sexual dysfunction (Fotinos et al., 2024). Overall, the literature suggests that the impact of PPU is not uniform but varies significantly depending on usage patterns, individual differences, and partner dynamics.

Distorted Perceptions and Sexual Scripts

Problematic pornography use significantly shapes an individual's internal understanding of sex, relationships, and self-worth by presenting exaggerated and unrealistic sexual presentations and scenarios. This exposure can foster misleading sexual scripts, particularly among adolescents and young adults, by cultivating problematic expectations such as rigid dominance-submission dynamics and highly specific gendered sexual roles (Peter & Valkenburg, 2016; Sun et al., 2016). Furthermore, the pervasive display of idealized body images and performance standards in pornography can lead to profound issues with body

Table 2.
Protective Factors against Problematic Pornography Use and Its Strongest Predictors in Adolescents and Adults Participants

Protective Factor	Description/Explanation	Related Studies
Religious devotion and worship	Engaging in religious practices and adherence to religious norms helps to develop more conservative attitudes toward pornography use.	Hardy et al. (2013); Baltazar et al. (2010); Grubbs et al. (2020); Rasmussen et al. (2018)
Spirituality	Adherence to religious or spiritual values was negatively associated with PPU.	Ma et al. (2017)
Family functionality	Providing emotional intimacy and support within the family reduces PPU.	Doornwaard et al. (2015); Greenfield (2004); Ma et al. (2017)
Social competence	Cognitive, emotional, and behavioral skills enable individuals to communicate effectively with others, reducing PPU.	Ma et al. (2017)
Self-esteem	Having a positive perception of oneself reduces the likelihood of PPU.	Li et al. (2023)
Self-control	The ability to control their personal behavior reduces PPU.	Grubbs et al. (2015)
Social relations	Positive social relationships are associated with lower levels of PPU.	Mesch (2009); Shek & Ma (2011); Kalina et al. (2009)
Commitment to school	A strong bond with the school makes them less likely to visit pornographic websites.	Varner et al. (2017)
School type	Religious schools and schools where boys and girls receive separate education reduce the risk of excessive pornography use.	Varner et al. (2017)

Note: PPU = Problematic pornography use.

dissatisfaction (Demirgöl et al., 2025; Gewirtz-Meydan et al., 2024; Gewirtz-Meydan & Spivak-Lavi, 2023), increased anxiety about sexual performance (Goldsmith et al., 2017; Wright et al., 2023). Consistent with these findings, Engelhardt et al., (2025) provided further evidence that PPU is significantly associated with elevated body dissatisfaction and broader psychopathological symptoms, underscoring the interplay between PPU and self-perception-related distress. Women, in particular, often report feeling inadequate when comparing themselves to performers shown in pornography, which negatively affects their self-esteem and broader relationship dynamics (Ashton et al., 2018; Fernández-Ruiz et al., 2023). These internalized distortions in perception and expectation can profoundly interfere with healthy interpersonal relationships and overall sexual satisfaction, especially when exposure begins at an early age (Owens et al., 2012). Such fundamental shifts in individual worldview can carry significant implications for how individuals navigate their social and intimate lives.

Aggression, Hostile Attitudes, and Digital Sexual Violence

Consumption of violent or misogynistic pornography has been shown to normalize sexual violence and increase the acceptance of rape myths, particularly against women (Rodríguez-Castro et al., 2021; Wright et al., 2016; Zhang et al., 2024). Problematic pornography use has also been linked to cyber dating violence, especially among adolescents, with hostile sexism moderating this association (Morelli et al., 2024). Moreover, pornography use frequency correlates with stronger endorsement of traditional gender roles, rape myths, and acceptance of dating violence (Evans-Paulson et al., 2023), while longer use was associated with increased hostile sexism and acceptance of sexual violence myths (Borgogna et al., 2022). Objectification and dehumanization of women in pornography (Bridges et al., 2024; Neufeld, 2020) may reinforce these attitudes. Recent studies have emphasized the

connections between pornographic language and misogynistic online communities such as Incels, suggesting broader societal implications (Hart & Huber, 2023; Tranchese & Sugiura, 2021).

The association between pornography use and acceptance of non-consensual behaviors underlines the urgency of prevention strategies targeting digital sexual violence (Hearn & Hall, 2022; Peter & Valkenburg, 2016; Wright et al., 2016).

Treatment Approaches for Problematic Pornography Use

Problematic pornography use involves loss of control, excessive use despite negative consequences, and impaired functioning (Antons et al., 2022; Bóthe et al., 2021). Treatment options include pharmacological, psychological, and neuromodulatory approaches, often combined and tailored to individual needs. However, small sample sizes and lack of standardization limit the consistency of findings (Sniewski et al., 2018). Digital and group-based interventions offer accessible treatment options.

Pharmacological Interventions

Pharmacological approaches target compulsive behaviors and cravings in PPU, primarily through μ -opioid receptor antagonists, such as naltrexone and nalmefene, which modulate reward system activity and reduce pornography use (Gola & Potenza, 2016; Kraus et al., 2015). Case reports have documented reduced viewing frequency with these agents (Capurso, 2017; Yazdi et al., 2020), and naltrexone has been found to be effective in managing CSBD (Savard et al., 2020).

SSRIs and SNRIs may also alleviate PPU symptoms, as serotonergic dysfunction is linked to impulsivity and compulsivity (Roza et al., 2024). Sertraline, alone or in combination with naltrexone,

has shown potential in reducing sexual urges and pornography use (Wainberg et al., 2006), although randomized trials remain scarce. These medications may also help manage co-occurring anxiety and depression (Roza et al., 2024).

Combination treatments, such as cognitive behavioral therapy (CBT) with naltrexone, have demonstrated further reduction in pornography use, suggesting that integrative approaches may enhance outcomes (Crosby & Twohig, 2016; Sharma et al., 2022). Overall, pharmacological interventions can help manage compulsive behaviors, but their effectiveness improves when combined with psychological therapy. Tailoring treatments to individual psychological and social factors is crucial for optimizing outcomes (Lewczuk et al., 2017).

Neuromodulation-Based Interventions

Emerging treatments include neuromodulatory approaches, though research remains limited. High-frequency repetitive transcranial magnetic stimulation has been associated with reductions in pornography cravings and anxiety (Cuppone et al., 2021). Similarly, combining transcranial direct current stimulation with acceptance and commitment therapy (ACT) has demonstrated stronger treatment effects (Seyedzadeh Dalooiyi, Sharbaaf, et al., 2023).

Psychological Interventions

Various psychological treatments have been developed to treat PPU, including CBT, ACT, and mindfulness-based interventions, all of which have shown promising outcomes (Bóthe et al., 2020; Minarcik, 2016). Despite the development of multiple approaches, only a few studies have systematically evaluated their effectiveness.

Cognitive behavioral therapy, through techniques such as psychoeducation, cognitive restructuring, exposure, and relapse prevention, has demonstrated efficacy in reducing pornography consumption and related compulsive behaviors (McGahan & Bridges, 2010; Minarcik, 2016; Ortega et al., 2020; Stark et al., 2024). In one study, CBT led to a 94% reduction in pornography use, along with significant decreases in hypersexual behavior and urges (Minarcik, 2016).

Acceptance and commitment therapy emphasizes the acceptance of distressing thoughts and engagement in value-driven actions. Interventions have resulted in notable decreases in pornography use and sexual compulsivity, both in therapist-led and self-help formats (Crosby & Twohig, 2016; Levin et al., 2017).

Mindfulness-based interventions have been effective in enhancing self-regulation and reducing pornography consumption. Studies using guided meditation and mindfulness relapse prevention protocols have shown significant improvements in PPU symptoms (Holas et al., 2020; Sniewski & Farvid, 2019; Sniewski et al., 2022). Likewise, cognitive analytic therapy has led to reduce their daily masturbation and improved mental health outcomes (Kellett et al., 2017).

Motivational Interviewing (MI) offers a non-judgmental environment for individuals to explore behaviors, promoting readiness to change. Integrating MI with CBT enhanced treatment outcomes, with reductions in compulsive pornography use and associated distress (Bricker & Tollison, 2011; Moyers, 2014).

Group interventions combining MI and CBT improved quality of life and reduced depressive symptoms, although effects on problematic internet use remained inconclusive (Bahner & Stenqvist, 2019; Bassett et al., 2022; Lundahl et al., 2010).

Integrative therapies combining cognitive, behavioral, and psychodynamic elements also yielded positive outcomes (Shorrock, 2012; Wéry et al., 2019). Psychodynamic therapy, along with family and couple therapy, addresses underlying shame and guilt, improves interpersonal relationships and reduces pornography reliance (De Alarcón et al., 2019; Ford et al., 2012; Kraus & Sweeney, 2019).

Group-Based Treatments and Self-Help Platforms

Group interventions offer support and psychoeducation, helping individuals cope with feelings of isolation and build social connections. Programs such as Recovering Couples Anonymous, Sex Addicts Anonymous, Sex and Love Addicts Anonymous, and Sexual Compulsives Anonymous follow 12-step models and have been used in PPU treatment, with participants reporting symptom improvements (Fernandez et al., 2021).

Non-governmental organizations have also developed self-help platforms to support individuals struggling with pornography use. In China, Reyboys aids adolescents facing pornography-related difficulties (Chen, 2022).

Web-Based Interventions

Digital interventions have been gaining traction. For instance, the Hands-off program, a 6-week online CBT, mindfulness, and MI-based intervention, resulted in reduced pornography consumption along with its negative consequences (Bóthe, Baumgartner, et al., 2020, 2021). Other self-help programs integrating motivational, mindfulness, and social psychology techniques demonstrated reductions in perceived addiction and pornography cravings (Bóthe et al., 2021). However, newer programs such as PornLoS have yet to undergo rigorous effectiveness studies (Stark et al., 2024). While these approaches hold potential, more research is needed to validate their long-term efficacy, as suppression-based strategies may be ineffective (Fraumeni-McBride, 2019).

A recent self-help intervention, imaginal retraining, which is based on approach bias modification, has also been explored as a low-threshold, web-based tool for PPU. Baumeister et al. (2024) found that, despite low adherence, participants who engaged regularly in retraining showed significant reductions in PPU, with high satisfaction reported. While these findings are preliminary, imaginal retraining offers the potential for individuals reluctant to seek formal treatment, warranting further study.

Web-based interventions offer accessible support for PPU, yet their impact relies on sustained engagement, highlighting the need for improved adherence and long-term evaluation.

Limitations of Existing Interventions

Previous intervention studies exhibited several limitations. First, the high attrition rate between pre-and post-test and follow-up assessments was an issue. It has been suggested to include romantic partners (i.e., couples) (Hatch et al., 2023) and broader measures assessing sexual well-being or other mental health

conditions to enhance adherence (Bóthe et al., 2021). Second, reliance on participants' self-reported data to determine the presence of PPU may limit the ability to accurately identify individuals with PPU symptoms. Therefore, using more objective measurements rather than relying solely on participants' subjective feelings regarding their pornography use behavior may increase the ability to capture PPU. This approach could facilitate reaching individuals who genuinely require intervention, potentially reducing dropout rates (Bóthe et al., 2021) and minimizing bias (Seyedzadeh Daloooyia et al., 2023). Third, the small sample size and predominance of male participants (84%) (Crosby & Twohig, 2016; López-Pinar et al., 2025; Seyedzadeh Daloooyia et al., 2023) may lead to less effective treatments for women, despite reports of PPU among women (Lewczuk et al., 2017). Fourth, excluding gender-diverse individuals by restricting options to male or female may limit understanding of treatment effectiveness in gender-diverse populations (Hatch et al., 2023).

Fifth, previous interventions were mostly conducted using CBT and ACT, suggesting the potential inclusion of additional behavioral therapy approaches/techniques focusing on reducing impulsive symptoms (Crosby & Twohig, 2016). Sixth, the absence of a control group in some studies may limit understanding of the causality and effectiveness of the intervention program (Hatch et al., 2023; Holas et al., 2020). Seventh, the use of short follow-up assessment durations or the complete omission of follow-up measurements (Holas et al., 2020) was noted, suggesting the inclusion of a longer duration for follow-up assessments. Lastly, conducting therapy sessions with a single therapist may adversely affect the efficiency of the intervention; therefore, using multiple therapists may increase the generalization of the therapy outcomes.

Protective and Preventive Interventions

Preventive strategies addressing pornography use and PPU focus on education, early intervention, and social awareness. Many young males report first encountering sexual content through pornography rather than formal education or parental guidance, contributing to distorted sexual beliefs and behaviors (Allen & Lavender-Stott, 2015). Family-based interventions that promote media literacy and open communication have been associated with healthier media habits and reduced behavioral risks (Fagan, 2009; Blaszczyński, 2016). Community-level programs, including school-based sexual education and digital literacy initiatives, support critical thinking and help mitigate negative influences of media exposure (Callak et al., 2024; Todorovic, Huisman, & Ostafin, 2024).

Porn literacy programs, which emphasize critical engagement with sexual media, have been implemented in various formats, including educator training, online modules for youth, and multi-session curricula for adolescents (Crabbe & Flood, 2021; Maas et al., 2022). Although randomized controlled trials are limited, such interventions have shown potential in shifting attitudes and behaviors, particularly when peer-supported (Rothman et al., 2020; Winarti et al., 2020). Additionally, harm reduction models that aim to minimize problematic outcomes rather than entirely eliminate their use are gaining relevance in public health strategies targeting pornography-related concerns (Rothman, 2021).

Current Issues and Challenges in Pornography Research

Conceptual Inconsistencies

One of the primary obstacles in pornography research is the lack of a standardized definition. Terms like “uncensored sexual content,” “sexual visual stimuli,” “erotica,” and “sexually explicit media” are used interchangeably, complicating research on pornography even further (Vaillancourt-Morel et al., 2019). The expansion of digital pornography and diversity in content have made it even more challenging to establish a clear and universally accepted definition (De Alarcón et al., 2019; Kohut et al., 2020).

This lack of conceptual clarity limits cross-study comparisons and weakens the consistency in the existing findings (Willoughby & Busby, 2016). While progress has been made in recent years, distinguishing between perceived addiction and actual PPU remains a challenge. Perceived addiction is subjectively reported as distress over pornography use, whereas PPU is measured through objective indicators, associated with frequency and dysregulation of use (Brand et al., 2019; Lewczuk et al., 2020). Developing reliable and valid assessment tools is essential for clarifying these distinctions (Lewczuk et al., 2020).

Social Desirability

Social desirability bias poses a significant challenge in research on PPU, as individuals often underreport their consumption due to moral, religious, or societal norms, particularly in highly religious populations (Rasmussen et al., 2018). Despite anonymity in surveys, the private and stigmatized nature of pornography contributes to frequent misreporting, which distorts prevalence estimates and limits accurate understanding of the phenomenon (King, 2022). While researchers are encouraged to use techniques such as anonymous surveys, indirect questioning, and neutral framing to mitigate this bias, its complete elimination remains difficult (Ried et al., 2022).

Sampling Bias

Sampling bias significantly limits the generalizability of findings in PPU research. Many studies rely on small, homogeneous, or convenience samples—often university students or online participants—which fail to reflect broader demographic variability (Bóthe et al., 2024). This issue is compounded by self-selected samples from online self-help communities such as NoFap or PornFree, where individuals often report more severe or morally conflicted experiences (Chasioti & Binnie, 2021). Platforms like MTurk further contribute to non-representative sampling, and a predominant focus on narrow age groups (e.g., adolescents or college students) neglects the wider population affected by PPU (Bóthe, Vaillancourt-Morel, et al., 2021; Esplin et al., 2020). To enhance validity and applicability, future research must adopt more inclusive sampling strategies encompassing diverse socioeconomic, age, and cultural groups (Bóthe et al., 2024; Chen et al., 2021).

Control Variables

Another key issue is the lack of appropriate control variables. Factors such as gender, age, relationship status, and sexual orientation significantly influence pornography use. Research indicates that men (Willis et al., 2022), LGBTQ individuals (Borgogna et al., 2022), and young adults (Solano et al., 2020)

report higher pornography consumption. Additionally, masturbation frequency is often overlooked as a control variable despite its close relationship with pornography use (Perry, 2020). Moreover, another issue is the design of the existing studies given that most PPU research relies on cross-sectional studies, which limits the ability to establish causal relationships. Therefore, longitudinal and experimental studies are needed to measure the long-term effects of pornography consumption (Grubbs & Kraus, 2021).

Ethical, Cultural, and Legal Constraints

Pornography research is hindered by ethical concerns, cultural stigmas, and legal restrictions. In some societies, pornography use is considered morally unacceptable, leading to participant reluctance and data collection challenges (Prochner, 2022). To address these concerns, ethical guidelines must ensure anonymity and confidentiality to encourage honest responses (Kang & Hwang, 2023). Non-judgmental and empathetic research environments (Sipes et al., 2022). Clear and accessible participant information, avoiding technical jargon.

Scarcity of Qualitative Studies

Furthermore, PPU research is predominantly quantitative, with underrepresented qualitative studies being underrepresented (Binnie & Reavey, 2020; Ince et al., 2023). This imbalance limits the understanding of PPU as a lived experience, making it difficult to capture the nuanced and subjective aspects of compulsive pornography use. More qualitative research is needed to explore the personal, relational, and contextual dimensions of PPU in depth.

Despite its increasing relevance, pornography research continues to face conceptual, methodological, ideological, and ethical challenges. Addressing these issues requires more precise definitions, improved sampling techniques, rigorous methodologies, and ethical sensitivity to ensure scientifically valid and socially relevant findings.

Conclusion

Problematic pornography use continues to be a complex and multidimensional phenomenon, situated at the intersection of behavioral addictions, impulse-control difficulties, and compulsive tendencies. Despite the variety of theoretical frameworks proposed in recent years, none has achieved broad scientific consensus. Likewise, a standardized diagnostic instrument that aligns directly with criteria for CSBD or with established ICD categories such as gambling and gaming disorders is still lacking. Existing scales provide useful insights but often measure dimensions of pornography use that do not map onto diagnostic systems, leaving a significant gap between assessment tools and clinical classification.

Methodological limitations also remain a major obstacle. Research is still dominated by convenience samples—typically university students or online self-selected participants—resulting in limited generalizability. This is especially problematic for national or cross-cultural prevalence studies. Understanding why some groups decline participation, and creating strategies to reach them, will be essential for building more representative datasets.

Evidence also highlights substantial heterogeneity in vulnerability. Traits such as impulsivity, insecure attachment, early exposure, and moral incongruence frequently emerge as risk factors, while social support, family functioning, and ethical or religious commitments often act as protective buffers. These findings point toward the importance of models that examine risk and resilience together, in cultural as well as developmental contexts.

The effects of PPU are similarly multifaceted. Excessive or dysregulated use has been associated with psychological distress, relational difficulties, sexual dysfunctions, and even aggressive attitudes. Yet these associations are rarely uniform; they are shaped by variables such as gender, sexual orientation, whether use is solitary or partnered, and cultural background. One critical gap is that most studies fail to account for the type of pornography consumed. Content characteristics—such as violent versus nonviolent material, amateur versus professional production, or fetish-focused versus romantic scenarios—likely exert distinct influences on sexual scripts, relational dynamics, and aggression. Systematically examining these dimensions will be vital to a fuller understanding of PPU.

Measurement challenges further complicate the field. Existing instruments differ widely in their theoretical basis, psychometric strength, and cultural validity. Moreover, the distinction between perceived addiction—often shaped by guilt or moral conflict—and clinically significant dysregulation remains blurred. Future work must prioritize the development of culturally adapted, psychometrically robust instruments that can reliably separate subjective distress from diagnosable impairment.

On the intervention side, CBT, ACT, mindfulness-based programs, pharmacological treatments, and emerging neuromodulation approaches have shown encouraging results. Online self-help platforms and group-based interventions are also gaining attention as accessible options. However, most available studies rely on small, male-dominated samples, short follow-up periods, and self-report measures, all of which limit their strength. Moreover, very few interventions involve couples, women, or gender-diverse individuals, leaving major gaps in applicability.

Limitations and Directions/Suggestions for Future Research

Looking ahead, several priorities emerge. Research should:

- Develop standardized diagnostic criteria and culturally sensitive measurement tools aligned with established psychiatric frameworks.
- Employ longitudinal and mixed-method designs to clarify causal pathways and capture lived experiences.
- Systematically investigate usage characteristics, including frequency, duration, and—crucially—the type of pornography consumed, as well as whether viewing is solitary or partnered.
- Explore reasons for non-participation to overcome sampling bias and strengthen representativeness in national and cross-cultural studies.
- Broaden intervention research to include diverse populations, integrate partners, and conduct longer follow-up assessments.

Current limitations and the future directions addressing those limitations are presented in Table 3.

Table 3.
Current Limitations and Future Directions

Area	Current Limitations	Future Directions
Conceptualization and classification	Competing models (addiction, impulse control, compulsive) without consensus; absence of diagnostic alignment	Develop standardized criteria; integrate theoretical models with ICD/DSM frameworks
Measurement	Existing scales lack diagnostic correspondence; variability in psychometric quality and cultural validity	Create culturally adapted, psychometrically robust instruments distinguishing perceived vs. clinical PPU
Sampling	Heavy reliance on convenience and online self-selected samples; underrepresentation of non-participants	Use nationally representative and cross-cultural samples; examine reasons for non-participation
Risk and protective factors	Impulsivity, insecure attachment, early exposure identified; protective roles of family/social support underexplored	Test integrative models of risk – resilience; conduct longitudinal cross-cultural analyses
Pornography content types	Most studies ignore the type of material consumed (violent vs. nonviolent, amateur vs. professional, fetish vs. romantic)	Systematically code and analyze content types; evaluate their differential effects on attitudes and relationships
Effects	Associations with mental health, relational functioning, aggression observed but causality unclear	Employ longitudinal and experimental designs; assess moderators (gender, orientation, usage context)
Treatment	Evidence for CBT, ACT, mindfulness, pharmacological, and neuromodulation approaches limited by small, male-dominated samples, and short follow-ups	Expand interventions to diverse populations, include couples/gender-diverse groups; use longer follow-up and controlled trials

Note: ACT = Acceptance and commitment therapy; CBT = Cognitive behavioral therapy; ICD = International Classification of Diseases; PPU = Problematic pornography use.

As a narrative review, this article has some inherent limitations. First, primarily peer-reviewed studies published in English were synthesized, which may have excluded relevant findings in other languages or in gray literature. Second, the review did not follow formal systematic protocols; therefore, the selection and interpretation of studies may reflect some degree of subjectivity. Third, given the rapid growth of publications on PPU, some of the most recent contributions may not have been included at the time of writing.

In addition, the literature itself is characterized by methodological weaknesses—most notably the predominance of convenience samples, reliance on self-report data, and the absence of standardized definitions and measurement instruments. These limitations are also reflected in the present synthesis. Finally, as a review, these conclusions cannot establish causality or assess intervention efficacy directly but only summarize the current evidence.

Future reviews should address these shortcomings by adopting systematic procedures, integrating studies from multiple languages and cultural contexts, and critically evaluating intervention trials using rigorous and diverse methodologies.

Advancing the science of PPU will require moving beyond ideological debates and building an empirically grounded, ethically responsible framework. Problematic pornography use can be situated within the wider context of digital sexual behaviors, mental health, and human development only through multidisciplinary collaboration.

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