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Internet Addiction Markers of Mental Health Disorders Among University Youth

Abstract

The study aims to determine the internet addiction markers of mental health disorders among university youth. Statistically significant differences were identified among the three groups based on the severity of internet addiction – low, medium, and high. Differences were found in all studied parameters based on the grouping variables “internet addiction” and “problematic use of mobile phone”. It was summarized that external markers of mental health showed direct correlations, while internal markers showed inverse correlations with internet addiction at a high level of significance.

Keywords: educational process, artificial intelligence, mental state, stress, gender differentiation

Introduction

Internet addiction among young people, especially students, is becoming an increasingly relevant problem. Excessive “hang-up” in the virtual space leads to social isolation and ongoing conflicts with the environment. It is logical that constant immersion in the virtual world results in a decrease in the number of real social contacts, misunderstandings with those who hold different values and ideals and do not share the enthusiasm for the internet. Perhaps the most harmful aspect is that internet addiction is a disease that affects the formation of young people’s value orientations, distancing them from traditional values and real life. The outlined contours emphasize the relevance of the studied scientific problem.

Markers of mental health are considered specific indicators, predictors, signs, or metrics that indicate a person’s mental state. Such markers can reflect both positive mental health and signal possible difficulties, illnesses, or complex mental conditions. Researcher T. Bax (2014) was one of the first to draw attention to the fact that internet-dependent youth, contrary to the traditional opinion of professionals, face not only problems with controlling the use of social networks or video games, but, more seriously, with normal functioning in society. It is important that even a decade ago, the scientist appealed to a global problem: internet-addiction is not an individual pathology, but a psychosocial-structural dilemma caused by economic Internet reform and the video industry’s pursuit of profit. Researchers X. Chen et al. (2024) focused on interpersonal uncertainty and dependence on mobile phones among Chinese college students. It was found that there is a mediating effect of social and emotional loneliness and a moderate effect of optimism. X. Du et al. (2024) focused their scientific investigation on the mediating role of expressive suppression and emotional well-being between loneliness and dependence on mobile phones among Chinese adolescents. The social anxiety disorder in the context of youth internet addiction in the Eastern Mediterranean region became the subject of study by E. Elrewany et al. (2025). Q. Jiang et al. (2023) examined the relationships between internet literacy, social network use, and internet addiction among Chinese youth and adolescents, driven by the increasing digital technologies and numerous educational internet applications. A. Johansson and K. Götestam (2004), as early as twenty years ago, documented rising indicators of internet-addiction across several criteria in a representative sample of Norwegian adolescents and young people aged 12–18 years. Researchers S. Hesapcioglu and H. Yesilova (2020) attempted to determine the relationship

between internet addiction and depressive symptoms, self-esteem, and bullying. The results of binary logistic regression analysis showed that bullies and victims usually have a high level of internet addiction. An increase in depression scores by one unit leads to a 3.80% increase in the likelihood of internet addiction, while an increase in self-esteem by one unit can reduce the likelihood of internet addiction by 1.70%. The researchers empirically proved and substantiated that participation in bullying, depression, and low self-esteem are predictors of internet addiction.

The issue of digitalization of the educational environment remains highly relevant. Researchers typically focus their efforts on finding optimal solutions to societal problems by implementing the latest digital educational technologies (Vargas-Hernández & Kariyev, 2023). At the same time, scientific investigations continually signal about problems of psycho-emotional fatigue (Makas & Koç, 2025) and exhaustion of learners (Zhang et al., 2024).

This study aims to establish the expression of relevant parameters of internet addiction and mental health, which are reflected in mood changes, attitude towards the environment, behavior, or any other changes. Digital technologies and the rapid development of artificial intelligence tools, including the widespread use of the generative AI chatbot ChatGPT by learners, which has swept Ukrainian and Kazakhstani societies, demand the attention of the scientific community and require joint efforts in studying the investigated phenomena.

The study aims

The aim is to conduct a theoretical and empirical study of internet addiction markers disorders of mental health among university youth.

Research hypothesis

Internet addiction markers will have significant differences and correlations with mental health parameters of university youth.

Methods and Materials

Sample

The study involved $n = 240$ respondents – students from three universities: Yuriy Fedkovych Chernivtsi National University (Chernivtsi, Ukraine), Kherson State University (Kherson, Ukraine) and Abai Kazakh National Pedagogical University (Almaty, Kazakhstan). The universities provided identical samples of $n = 120$ people (50.00%) in their second or third year of full-time study.

The combined sample was also gender-balanced: men ($n = 120$; 50.00%) and women ($n = 120$; 50.00%). The age of the subjects ranged from 19 to 22 years. The main descriptive characteristics of the Ukrainian sample ($M = 19.87$; $SD = \pm 3.36$) and Kazakhstani sample ($M = 20.12$; $SD = \pm 3.49$).

Research Organization

This research was conducted in accordance with the principles of the Declaration of Helsinki. Respondents provided personal written consent to participate in the study, after which they received access to the questionnaires. The researchers jointly developed the project and research design, coordinated the adapted psychodiagnostic toolkit, and underwent internal approval procedures for the research topic within their universities. An equal number of respondents was randomly selected, with an identical gender distribution. The study was conducted confidentially, in accordance with ethical requirements for such research. The collection of empirical data out between September and November 2025 year.

Instruments and Procedures

The core instrument that formed the basis of the research design was the “Internet Addiction Test” (IAT) by K. Young (1998). An empirical division into three groups with low, medium, and high levels of internet addiction was used in the study. The statistical reliability was determined using Cronbach’s alpha coefficient, which was found to be high ($\alpha = .977$). The next instrument was the “Problematic Use of Mobile Phone Scale” (PUMP) Merlo et al. (2013). Like the previous methodology, this approach included one scale. In the current methodology, the scale is titled “problematic use of mobile phone” (PUMP). A high level of statistical reliability of the “PUMP” scale was recorded ($\alpha = .943$). Among the huge variety of methodologies for diagnosing mental health, preference was given to valid and reliable tools with a small number of statements that highlighted important measures of the studied phenomenon in the junior sample. The “Multidimensional Health Locus of Control Scale” (MHLCS) (Wallston et al., 1978) was used to determine the internal and external intentions of university youth. Three scales of the methodology were used: internal locus of control (ILC); powerful others locus of control (POLC); and chance locus of control (CLC). In other words, young people identified whom/what their health depends on: themselves, medical staff, or a fortunate coincidence of circumstances and fate. For each scale, the measurement range was the same – from 6 to 30 points. High levels of statistical reliability were recorded for all

scales: “ILC” ($\alpha = .921$), “POLC” ($\alpha = .976$), and “CLC” ($\alpha = .912$). The fourth and final methodology used in the study was the “Positive Mental Health Scale” (PMH-SCALE) (Lukat et al., 2016). The methodology included one “Positive Mental Health” scale (PMH). A high level of statistical reliability was recorded for the “PMH” ($\alpha = .986$).

Data Analysis

Data from Google Forms were automatically generated into an empirical data matrix in the MS Excel computer program. For conducting statistical operations, the “SPSS” (version 26.00.01) statistical software package was used. The following statistical criteria were applied in the study: Cronbach’s alpha coefficient (α) for scale reliability; Kruskal-Wallis (H) test for three independent samples; Student’s t-test (t) for two independent samples; and Pearson’s (R) correlation coefficient. Bilateral significant correlations at levels not lower than $p \leq .050$ were considered.

Results

The set of studied parameters related to internet addiction markers of university youth’s mental health is relevant and methodologically justified. Emphasis was placed on a valid, reliable, and representative psychodiagnostic toolkit, tested on Ukrainian and Kazakhstani youth samples (Kariyev et al., 2025; L masheva et al., 2025). Using the “Internet Addiction Test” (Young, 1998), three groups were identified based on the severity of internet addiction: Group 1 – a low level of internet addiction ($n = 64$; 26.67%); Group 2 – moderate level of internet addiction ($n = 98$; 40.83%); Group 3 – a high level of internet-addiction ($n = 78$; 32.50%). In Table 1, the results of the comparison of studied variables according to the “PUMP” (Merlo et al., 2013), “MHLCS” (Wallston et al., 1978), and “PMH-SCALE” (Lukat et al., 2016) methods are presented, using the Kruskal-Wallis (H) test.

Table 1. Comparison of the parameters of problematic use of mobile phone and mental health of the studied internet-addicted groups

Group	Median	Compared variables				
		PUMP	ILC	POLC	CLC	PMH
1	Me	41.00	29.00	9.00	11.00	29.00
2	Me	51.00	22.00	14.00	15.00	24.00
3	Me	62.00	12.00	19.00	17.00	16.00

Group	Median	Compared variables				
		PUMP	ILC	POLC	CLC	PMH
Kruskal-Wallis (H) criterion	H	61.245***	30.380***	27.855***	25.835***	28.808***
	p	< .001	< .001	< .001	< .001	< .001

Note: * – $p \leq .050$; ** – $p \leq .010$; *** – $p < .001$.

Source: Own research.

We conclude that the comparison of all studied parameters demonstrated statistically significant differences across all measures ($p < .001$). The most notable difference was observed in the parameter “problematic use of mobile phone” ($H = 61.245$; $p < .001$). Table 2 presents the results of the comparison by the grouping variable “gender differentiation” between male students (Group 1) and female students (Group 2) using Student’s t-test for two independent samples with determination of the effect size.

Table 2. Indicators of the comparative analysis based on the grouping variable “gender differentiation”

Scale	Levene's test		Student's t-test for the equality of variances				Cohen's d
	F	p	t	p	95 CI		
					Lower	Upper	
IA	.340	.492	-.916	.334	-3.755	1.087	-.134
PUMP	.318	.574	-1.016	.312	-3.255	1.048	-.185
ILC	.950	.332	.795	.428	-1.071	2.507	.145
POLC	.001	.980	-1.006	.317	-3.072	1.003	-.184
CLC	.888	.348	1.217	.226	-.569	2.383	.222
PMH*	6.138	.015	2.618	.121	.364	3.574	.176

Note: * – data are presented using Welch’s test; F – Levene’s test for the equality of variances (two-sided); t – Student’s t-test; 95% CI – confidence interval; Cohen’s d – effect size.

Source: Own research.

We conclude that there are no significant differences in the studied scales based on the grouping variable “gender differentiation” between male students ($n = 120$; 50.00%) and female students ($n = 120$; 50.00%). In Table 3, the results of the comparison based on the grouping variable “internet addiction” are presented using Student’s t-test for two independent samples.

Table 3. Indicators of the comparative analysis based on the grouping variable "internet-addiction"

Scale	Levene's test		Student's t-test for the equality of variances				Cohen's d
	F	p	t	p	95 CI		
					Lower	Upper	
PUMP	.944	.333	10.238***	< .001	16.780	24.828	2.210
ILC	.605	.438	-5.295***	< .001	-8.435	-3.843	-1.143
POLC*	7.599	.007	5.564***	< .001	4.255	9.176	1.658
CLC	2.102	.150	-5.354***	< .001	-8.036	-3.696	-1.156
PMH	2.295	.132	4.872***	< .001	2.338	5.543	1.051

Note: * – data are presented using Welch's test; F – Levene's test for the equality of variances (two-sided); t – Student's t-test; 95% CI – confidence interval; Cohen's d – effect size; * – $p \leq .050$; ** – $p \leq .010$; *** – $p < .001$.

Source: Own research.

Five significant differences across the scales were identified ($p < .001$): "problematic use of mobile phone", "internal locus of control", "powerful others locus of control", "chance locus of control" and "positive mental health". The most common Cohen's d effect size scaling was used: .200 – low severity; .500 – moderate severity; $\leq .800$ – high severity. Significant superiorities in terms of "problematic mobile phone use," "powerful others locus of control," and "chance locus of control" belong to the group with high severity of internet addiction. Statistically significant superiorities in the parameters "internal locus of control" and "positive mental health" belong to the group with a low level of internet addiction. The largest effect size was recorded for the parameter "problematic use of mobile phone" ($d = 2.210$). Therefore, internet-addicted respondents significantly dominate in the number of studied parameters. In Table 4, the results of the comparison based on the grouping variable "problematic use of mobile phone" are presented using Student's t-test for two independent samples.

Table 4. Indicators of the comparative analysis by the grouping variable "problematic use of mobile phone"

Scale	Levene's test		Student's t-test for the equality of variances				Cohen's d
	F	p	t	p	95 CI		
					Lower	Upper	
IA	1.583	.211	6.230***	< .001	4.024	7.775	1.138
ILC*	24.174	<.001	-3.909***	< .001	-5.104	-1.663	-.726

Scale	Levene's test		Student's t-test for the equality of variances				
	F	p	t	p	95 CI		Cohen's d
					Lower	Upper	
POLC*	7.014	.009	5.942***	< .001	3.580	7.160	1.080
CLC*	7.478	.007	-5.944***	< .001	-5.187	-2.594	-1.078
PMH	1.106	.295	-10.170***	< .001	-21.068	-14.203	-1.858

Note: * – data are presented using Welch's test; F – Levene's test for the equality of variances (two-sided); t – Student's t-test; 95% CI – confidence interval; Cohen's d – effect size; * – $p \leq .050$; ** – $p \leq .010$; *** – $p < .001$.

Source: Own research.

Five significant differences across the scales were observed ($p < .001$): “internet addiction”, “internal locus of control”, “powerful others locus of control”, “chance locus of control”, and “positive mental health”. Significant superiorities regarding the parameters “internet addiction” and “powerful others locus of control” belong to the group with a high level of problematic mobile phone use. Significant superiorities for the parameters “internal locus of control,” “chance locus of control,” and “positive mental health” belong to the group with a low level of problematic mobile phone use. The largest effect size was recorded for the parameter “positive mental health” ($d = -1.858$). Thus, respondents with a low level of problematic mobile phone use predominantly differ across the studied parameters.

The Kolmogorov-Smirnov (Z) test was used to identify unequal variances, indicating a deviation from the law of normal distribution in the empirical dataset. Such deviations were observed in nearly half of the scales. The psychological internet addiction markers were determined using Pearson's correlation coefficient (R) In Table 5, the correlation matrix of internet addiction markers is presented.

Table 5. Correlation matrix of internet-addiction markers of mental health in the selective sample

Variables studied	Internet addiction
Problematic use of mobile phone (PUMP)	.873***
Internal locus of control (ILC)	-.598***
Powerful others locus of control (POLC)	.573***
Chance locus of control (CLC)	.542***
Positive mental health (PMH)	-.624***

Note: * – $p \leq .050$; ** – $p \leq .010$; *** – $p < .001$.

Source: Own research.

Five significant correlations were observed between internet addiction and the studied parameters ($p < .001$): three direct correlations with “PUMP”, “POLC”, and “CLC”, and two inverse correlations with “ILC” and “PMH”. In summary, external markers of mental health demonstrated direct correlations with high significance, while internal markers showed inverse correlations with high significance.

Discussions

Internet addiction, problematic use of gadgets, and phubbing are far from an exhaustive list of addictions that researchers focus on in the era of rapid development of the World Wide Web, video games, and artificial intelligence tools. All these dependencies have a negative impact on mental health, as demonstrated by a large number of analyzed empirical studies (Hudimova et al., 2021; Pissin et al., 2021; Soriano-Molina et al., 2025; Wang et al., 2023).

We conclude that the tendency of the studied respondents to attribute responsibility for their mental health to significant others, medical staff, a fortunate chance, or fate is a vivid example of avoidance of responsibility. These results align with the conclusions of researchers A. Kariyev et al. (2025), who emphasized the closedness, dreaminess, and, importantly, the lack of self-control in students with pronounced internet addiction. The absence of self-control aligns with the passive stance of respondents and their tendency to evade responsibility, as we have established. In another study, L. Limasheva et al. (2025) found that, despite respondents' high resilience, excessive use of mobile phones induces chronic stress. This fact aligns with the significant differences we identified across five parameters based on the grouping variable “problematic use of mobile phone” (see Table 4). It should be noted that the largest effect size was recorded for the parameter “positive mental health” ($d = -1.858$). This is explained by the fact that positive mental health is the most sensitive measure to problematic mobile phone use.

The measured parameters (see Table 1) are classified as demonstrating moderate to above-moderate levels of expression. Compared to data obtained using similar methodologies but with different research focuses (Kariyev et al., 2025; Limasheva et al., 2025), no significant differences were found. At the same time, processes of excessive digitalization of the educational environment, the struggle for quality of educational services, and attempts to replace routine functions with an AI-assistant can only provoke and increase the time individuals spend in the virtual space.

Let us focus on some empirical attempts to compare the obtained data. No significant differences were found based on the grouping variable “gender dif-

ferentiation" (see Table 2). This is explained by the fact that gender is not a feature of dependence but rather reflects content-specific characteristics of social media use. Significant differences across all parameters were recorded based on the grouping variable "internet addiction" (see Table 3). This is explained by the fact that the superiority in parameters "problematic use of mobile phone," "powerful others locus of control," and "chance locus of control" represents an avoidance of responsibility, which leads to a high expression of internet addiction. It is logical that respondents with low levels of addiction exhibit superiority in the parameters "internal locus of control" and "positive mental health," the development of which, accordingly, will promote immunity and protection against internet addiction. However, a different picture is observed compared to the previous one (see Table 3). The difference lies in the fact that unexpectedly, the superiority in "chance locus of control" belongs to the group with a low level of problematic mobile phone use. This is explained by the fact that the phone has become an integral part of our existence as a means of communication and is not always associated with internet use. This may have led to the mentioned adjustments in empirical indicators. The logical culmination of our study is the construction of a correlation matrix (see Table 5), which demonstrated that external markers of mental health have direct correlations ($p < .001$) with the parameters "problematic use of mobile phone," "powerful others locus of control," and "chance locus of control," while internal markers have inverse correlations ($p < .001$) with the parameters "internal locus of control" and "positive mental health".

The aim was achieved, the hypothesis was confirmed, and the internet addiction markers of university youth's mental health were clarified and justified.

Conclusions

Attention was drawn to digital technologies, the rapid development of artificial intelligence tools, and the widespread adoption by university students of the generative artificial intelligence ChatGPT, which required urgent attention from the scientific community and called for joint efforts in studying the investigated phenomena. Significant differences at a level of ($p < .001$) were identified between the three groups of internet addiction severity – low, medium, and high. It was established that, based on the grouping variable "gender differentiation," no differences were recorded across the studied groups. Significant differences were found in all studied parameters based on the grouping variables "internet addiction" ($p < .001$) and "problematic use of mobile phone" ($p < .001$). The correlation matrix revealed five significant correlations ($p < .001$):

three direct correlations with “problematic use of mobile phone,” “powerful others locus of control,” and “chance locus of control,” and two inverse correlations with “internal locus of control” and “positive mental health.” It was emphasized that respondents with a high expression of internet addiction are not inclined to take care of their mental health, tend to shift responsibility onto significant others, medical personnel, a lucky coincidence, or fate, which is evidence of the coping strategy “escape” or “avoidance of responsibility”. The obtained results should be integrated into the theory and practice of the educational process in universities.

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Conflicts of Interest

The authors declare no conflict of interest.

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