Internet addiction and the Psychometric Properties of the Nine-Item Internet Disorder Scale–Short Form (IDS9-SF)

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Introduction

Despite the many potential benefits associated with using the internet, numerous problems such as exposure to inappropriate images and content, absence of privacy, and internet addiction (IA) among a small minority have been reported as a result of this increasing usage [1]. Although internet addiction has been identified as a prevalent problem among a small minority of the population, it has never been classed as a formal disorder most likely because internet addiction is an umbrella term covering more specific online problematic behaviors such as online problematic gaming and problematic social media use [2]. Many psychometric studies have been carried out and there are over 20 different assessment scales that have been developed to assess problematic internet use behavior [3].

Irrespective of whether disordered internet use is an addiction, research has consistently shown that excessive internet use can lead to psychological and behavioral problems among a small minority of individuals [4], including physical health issues (e.g., dry eyes, neck, back and shoulder pain, regular headaches, numbness pain in the thumb, index and middle fingers) [5, 6]. Furthermore, there have been many reporting negative of impacts of excessive internet use among adolescents including poor dietary habits [7], physical inactivity, lack of adequate sleep [5, 8] increased depression and loneliness, and social anxiety [5, 9].

Objectives

The aim of the present study was to determine the prevalence of disordered internet use among adolescent university students, its association with various health complaints, and behaviors, and most importantly to examine the psychometric properties of IDS9-SF.

Subjects

■**Design:** This is a cross-sectional study.

■**Duration of Study:** September 2017 to February 2018

■**Subjects:** A total of 2,500 students aged 18 to 25 years were approached via a multistage stratified random sampling technique among university students in Istanbul, Turkey, and 1,988 (79.5%) students gave consent.

■**Measures:** In addition to sociodemographic information (age, gender, income, academic performance), the survey included the nine-item Internet Disorder Scale Short-Form (IDS9-SF) [10]. The IDS9-SF is a unidimensional, standardized psychometric scale that assesses internet use disorder. The IDS9-SF uses 5-point Likert scales and total scores can range from 9 to 45, with higher scores being indicative of a higher degree of internet use disorder.

■**Statistical Analysis:** The statistical analysis included student t-tests, chi-square, and Fisher's exact tests (two-tailed). Multiple stepwise regression analysis used to determine the potential predictors as risk factors for internet disorder. Statistical significance was accepted at the $p < 0.05$ level.

Results

The prevalence of internet use disorder in the present Turkish sample was 18.3%. There were significant differences between age, gender, family income, and rank in school exams (all $p < 0.001$). Predictably, significantly more daily hours were spent on the internet among internet disordered participants compared to non-internet disordered participants ($p = 0.001$). Those with internet disorder were significantly more likely to have headaches, blurred vision, double vision, hurting eyes, hearing problems, and eat fast food frequently (all $p < 0.001$). Significantly fewer participants with internet disorder reported engaging in vigorous and moderate physical activity compared to non-internet disordered participants ($p < 0.001$). The multiple stepwise regression analysis demonstrated that gender, BMI, household income, number of people living at home, having a computer at home, having internet facilities, duration of internet use, sleeping hours, frequency of eating fast food, watching television, headaches, hurting eyes, tired eyes, and hearing problems were significantly associated with (and key predictors of) internet disorder. Moreover, the Cronbach's alpha reliability coefficient was high ($\alpha = 0.85$) and the factor determinacy was 0.89, which is well above the desired threshold of 0.80, supporting reliability and validity of the instrument.

Table 2. The Characteristics of Dietary and Comorbid Factors (N=1,988)

Variables	Internet disorder N=364	Non-internet disorder N=1,624	p-value
Medical Comorbid Factors	n (%)	n (%)	
Headaches	208 (10.5)	1,020 (51.3)	0.044
Blurred vision	95 (4.8)	578 (29.1)	0.001
Double vision	70 (3.5)	162 (8.1)	<0.001
Eyes hurt	96 (4.8)	624 (31.4)	<0.001
Eye tire	101(5.1)	379 (19.1)	0.076
Dizziness	138 (6.9)	582 (29.3)	0.457
Any hearing problem	107 (5.4)	272 (13.7)	<0.001
Physical activities			
Vigorous activity	158 (7.9)	840 (42.3)	0.004
Moderate activity	181 (9.1)	1,035 (52.1)	<0.001
Frequency of eating fast food			
Daily	97 (26.6)	317 (19.5)	<0.001
Weekly	120 (33.0)	627 (38.6)	
Monthly	88 (24.2)	274 (16.9)	
Occasionally	59 (16.2)	406 (25.0)	

Table 3. Multiple Stepwise Regression Analysis Predictors for Determinants of Internet Disorder Affect (N= 1,988)

Independent Variables	B	Standard Error	Beta	t test value	p-value
Constant	41.553	3.814		10.895	<0.001
Gender	-1.615	0.596	-0.050	-2.709	0.007
Body mass index	0.438	0.054	0.163	8.106	<0.001
Household income	2.199	0.333	0.140	6.604	<0.001
No of people living at home	1.057	0.158	0.128	6.674	<0.001
Computer at home	3.208	0.945	0.074	3.395	0.001
Internet facilities	-4.346	1.071	-0.087	-4.057	<0.001
Internet use in hours	0.255	0.118	0.041	2.165	0.031
Sleeping Hours	-2.307	0.245	-0.189	-9.413	<0.001
Frequency of eating fast food	-1.053	0.283	-0.068	-3.723	<0.001
Frequency of watching TV	3.641	0.333	0.216	10.945	<0.001
Headaches	1.579	0.636	0.048	2.485	0.013
Hurt eyes	2.813	0.674	0.085	4.172	<0.001
Tired eyes	-3.012	0.716	-0.082	-4.208	<0.001
Hearing problems	-3.542	0.742	-0.088	-4.770	<0.001

Limitations

Firstly, although it examined the associations between disordered internet use and many other behaviors and health issues, the data were cross-sectional and therefore no conclusions can be made concerning issues of causality. Secondly, there may be reporting bias by students such as hiding the duration of internet use due to the self-reported scale. Lastly, factors relating to family members, the social environment, and disordered internet use were not assessed in the present study.

Conclusion

The results of the present study supported the internal consistency of the IDS9-SF which are based on adapted criteria for Internet Gaming Disorder in the DSM-5 [11]. Analysis demonstrated good Cronbach's alpha and composite reliability. Therefore, the IDS9-SF appears to be a valid and reliable measure for assessing Internet Disorder among Turkish population.

References

- 1) Ramezani M, Salehi M, Namiranian N. Validity and reliability of the Chen Internet Addiction Scale. Journal of Fundamentals of Mental Health, 2012;14(55), 236-245.
- 2) Kuss DJ, Griffiths MD. Internet addiction in psychotherapy. Basingstoke: Palgrave Macmillan 2015.
- 3) Kuss DJ, Griffiths MD, Karila L, Billieux J. Internet addiction: A systematic review of epidemiological research for the last decade. Current Pharmaceutical Design, 2014;20,4026-4052.
- 4) Widyanto L, Griffiths MD. Internet addiction: A critical review. International Journal of Mental Health and Addiction, 2006; 4, 31-51.
- 5) Park S, Hong KE, Park EJ, Ha KS, Yoo HJ. The association between problematic internet use and depression, suicidal ideation and bipolar disorder symptoms in Korean adolescents. Australian & New Zealand Journal of Psychiatry, 2013;47,153-159.
- 6) Bener A, Yildirim E, Torun P, Çatan F, Bolat E, Aliç S, Griffiths MD. Internet addiction, fatigue, and sleep problems among adolescent students: A large-scale study. International Journal of Mental Health and Addiction, 2018; 1-11.
- 7) Bener A, Al-Mahdi HS, Vachhani PJ, Al-Nufal M, Ali AI. Do excessive internet use, television viewing and poor life-style habits affect low vision in school children? Journal Child Health Care, 2010;14,375-385.
- 8) Ekinci Ö, Celik T, Savaş N, Toros F. Association between internet use and sleep problems in adolescents. Nöro Psikiyatri Arşivi, 2014;51(2),122-128.
- 9) Celik V, Yesilyurt E, Korkmaz O, Usta E. From the perspective of loneliness and cognitive absorption internet addiction as predictor and predicted. Eurasia Journal of Mathematics, Science & Technology Education, 2014;10(6), 581-594.
- 10) Pontes HM, Griffiths MD. The development and psychometric properties of the Internet Disorder Scale - Short Form (IDS9-SF). Addicta: The Turkish Journal on Addictions, 2016; 3(3), 303-318.
- 11) Pontes HM, Griffiths MD. Measuring DSM-5 Internet gaming disorder: Development and validation of a short psychometric scale. Computers in Human Behavior, 2015;45,137-143.

Table 1. Socio-demographic characteristics of participants (N=1,988) with and without internet disorder

Variables	Internet disorder N=364 (n/%)	Non-internet disorder N=1624 (n/%)	p-value
Age Groups	n (%)	n (%)	0.084
≤20	122(33.5)	623 (38.4)	
>20	242(66.5)	1,001 (61.6)	
Gender			<0.001
Male	201 (55.2)	686 (42.2)	
Female	163 (44.8)	938 (57.8)	
Family income			<0.001
<\$1.000	139 (38.2)	875 (53.9)	
\$1.000-1.500	106 (29.1)	478 (29.4)	
>\$1.500	119 (32.7)	271 (16.7)	
Academic Performance			<0.001
Very good	98 (27.0)	375 (23.1)	
Good	148 (40.6)	763 (47.0)	
Average	78 (21.4)	420 (25.9)	
Poor	40 (11.0)	66 (4.0)	
	Mean ± SD	Mean ± SD	
No of bedrooms at your bedroom	3.42±0.901	3.57±0.992	<0.001
No of people are living at home	5.52±2.013	4.80±1.852	<0.001
Hours of sleeping / day	6.05±1.097	6.80±1.310	<0.001
Hours of internet use / day	5.78±2.673	5.58±1.980	<0.001